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# High and rising health care costs: Demystifying U.S. health care spending

See companion Policy Brief available at [www.policysynthesis.org](http://www.policysynthesis.org)

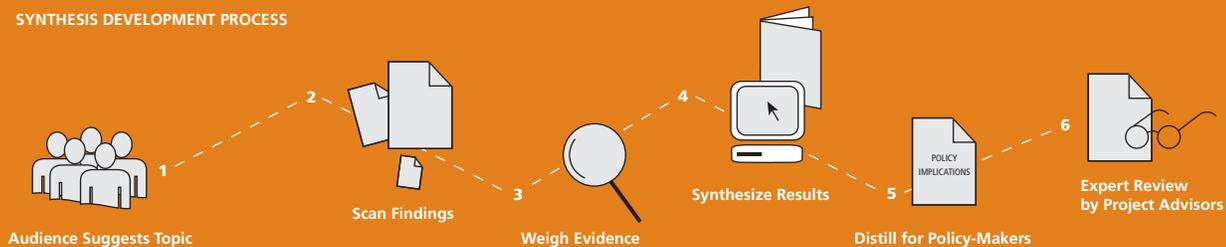
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**THE SYNTHESIS PROJECT** (Synthesis) is an initiative of the Robert Wood Johnson Foundation to produce relevant, concise, and thought-provoking briefs and reports on today's important health policy issues. By synthesizing what is known, while weighing the strength of findings and exposing gaps in knowledge, Synthesis products give decision-makers reliable information and new insights to inform complex policy decisions. For more information about the Synthesis Project, visit the Synthesis Project's Web site at [www.policysynthesis.org](http://www.policysynthesis.org). For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail request to [pubsrequest@rwjf.org](mailto:pubsrequest@rwjf.org).

### SYNTHESIS DEVELOPMENT PROCESS



## Introduction

Concern about high and rising health care costs in the United States has increased sharply in recent years (45). Indeed a popular topic of discussion in health policy circles is whether steps can be taken to expand insurance coverage without simultaneously taking steps to slow rising health care costs.

By any measure—per capita spending or share of gross domestic product (GDP), for example—U.S. spending on health care is greater than other developed countries. In 2006, the United States spent \$2.1 trillion, or 16 percent of GDP, on health care, translating to \$7,026 per person annually (9). Yet unlike other developed countries that provide near-universal coverage, the United States in 2006 had 47 million people, or 15.8 percent of the U.S. population, who were uninsured (25).

The increased attention to health care costs is merited and likely reflects the recent trend of health insurance premiums—the most visible indicator of health care costs—growing at a much faster rate than workers’ earnings. According to data from the Kaiser Family Foundation-Health Research and Educational Trust Annual Employer Survey and the U.S. Department of Labor, premiums for employment-based private insurance increased 114 percent from 1999 to 2007, while earnings increased 27 percent, leaving a gap of 7 percentage points per year, on average (46, 86).<sup>1</sup>

The gap between health spending trends and income trends likely has led to a sharp increase in the proportion of the population concerned about their ability to afford health insurance in the future. When health care spending grows at much faster rates than GDP or workers’ earnings, health insurance becomes less affordable—and more people become uninsured.<sup>2</sup> Those who can continue to afford coverage are finding that premiums and payments for medical care not covered or paid for by insurance are becoming increasingly large over time in relation to income. As state and federal political leaders recognize these pressures, they have responded to voter concerns with proposals aimed at making insurance more affordable. At the same time, government leaders are recognizing that costs of existing government commitments to finance health care are already crowding out other public spending priorities, increasing pressure for higher tax rates and, at the federal level, leading to higher deficits.

### Key Concepts: Understanding Health Care Costs

Issues of health care costs have long confused many people because some terms that sound alike have distinct meanings or because the same term is used—imprecisely—to refer to different concepts. For example, the term “costs” can mean the cost of a unit of service, the price of that service, or the cost or price of all of the services an individual or a nation uses annually. Since both the number of units of services per person and cost per unit have increased over time, this synthesis will focus on spending, which combines unit costs and rates of use, both in the aggregate and by component, such as hospital care, physician services, prescription drugs and other services. People also mistakenly use health care costs trends interchangeably with health insurance premium trends—the two are distinct but linked. Over time, spending on health care services covered by insurance drives premium trends, but premium trends can diverge from spending on covered services because the former are also affected by other factors, especially in the short run.

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1 The amounts contributed by employees increased by 115 percent for single coverage and 112 percent for family coverage, roughly the same as the overall premium increase, reflecting the stability in the proportions paid by employers and employees.

2 Kronick and Gilmer (49) have estimated this relationship using aggregate time series data, concluding that almost the entire decline in health insurance coverage among workers from 1979 to 1995 is attributable to health spending growing more rapidly than income.

## Introduction

Health care spending per capita has increased each year, at least since 1960, when the federal government began tracking U.S. health care spending through the National Health Expenditure Accounts (NHEA), a measure of all spending on health services. In addition to spending by private insurance and out-of-pocket spending, the NHEA include spending by public programs, such as Medicare and Medicaid, spending by the uninsured, and spending for services not covered by insurance, such as over-the-counter medications. Since it is the most comprehensive measure of spending, it will be the principal focus in this synthesis. Of greatest concern to policy-makers is spending on services typically covered by insurance, since those services are likely to be the most important to people (as evidenced by their coverage by insurance) and because so much public funding subsidizes them, whether directly (Medicare and Medicaid) or indirectly through tax subsidies to private health insurance.<sup>3</sup>

Another key conceptual distinction is between the level of spending during a period of time and trends in spending over time. U.S. health spending per person is very high in relation to that of other developed countries and also is increasing rapidly over time. The distinction is important to understanding what is driving spending and what can be done to address it. For example, many believe that the fragmentation of health care financing and delivery in the United States is a factor behind high spending per person, but it may not be an important factor behind the growth in spending over time. If fragmentation leads spending to be X percent higher than it could be, that X percent could be relatively constant over time. Other factors, such as medical technology, lead both to high spending per person—technology that has already been incorporated into care delivery—and spending increasing over time as new technologies are developed and diffuse.

This synthesis addresses the following questions:

1. What are the historical data on health care spending?
2. Are health care costs too high?
3. How does U.S. spending on health care compare with other developed nations?
4. What is driving the growth in health care spending?
5. What are the short-term spending trends?

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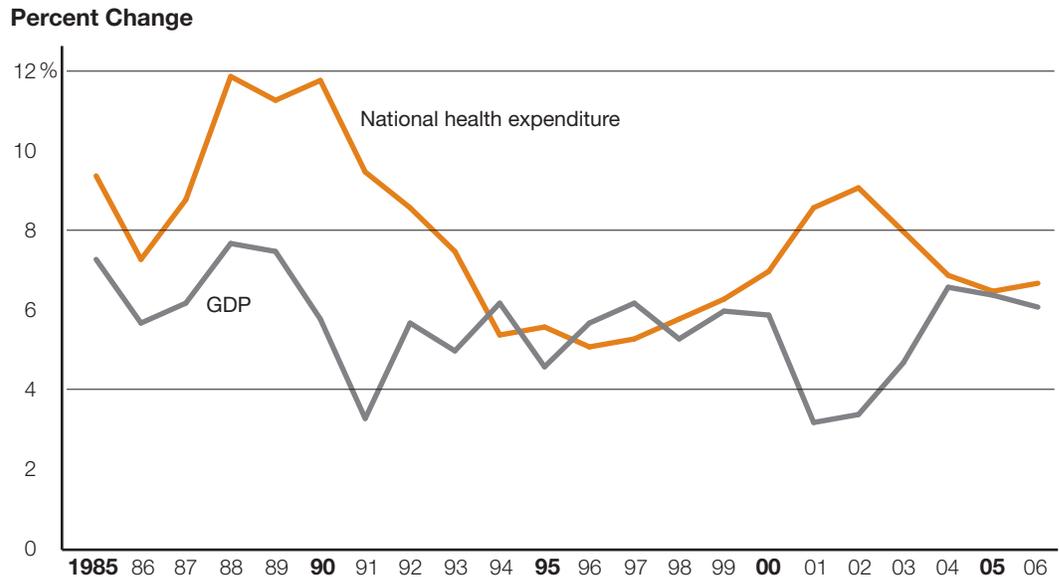
<sup>3</sup> Employer contributions to employee health benefits are not taxable to the employee. Employee contributions made through a Section 125 cafeteria plan are made from pre-tax income.

## Findings

### What are the historical data on health care spending?

The NHEA maintained by the Centers for Medicare and Medicaid Services (CMS) Office of the Actuary are considered the “gold standard” for measurement of spending trends. They examine both sources and uses of funds for health services and some other categories, such as research. Between 1960 and 2006, health care spending increased by an average of 9.9 percent per year, while GDP increased 7.3 percent per year (11). With appropriate compounding, this amounts to a gap of 2.5 percentage points per year between spending growth and GDP growth, resulting in the share of GDP devoted to health care increasing from 5.2 percent in 1960 to 16 percent in 2006. In inflation-adjusted terms, the health spending trend is more than twice as large as the GDP trend. Figure 1, which focuses on the second half of this historical period, shows the strikingly different relationship between the trends in health spending and GDP in different periods.

Figure 1. Annual Growth Rate of Health Spending and GDP, 1985–2006



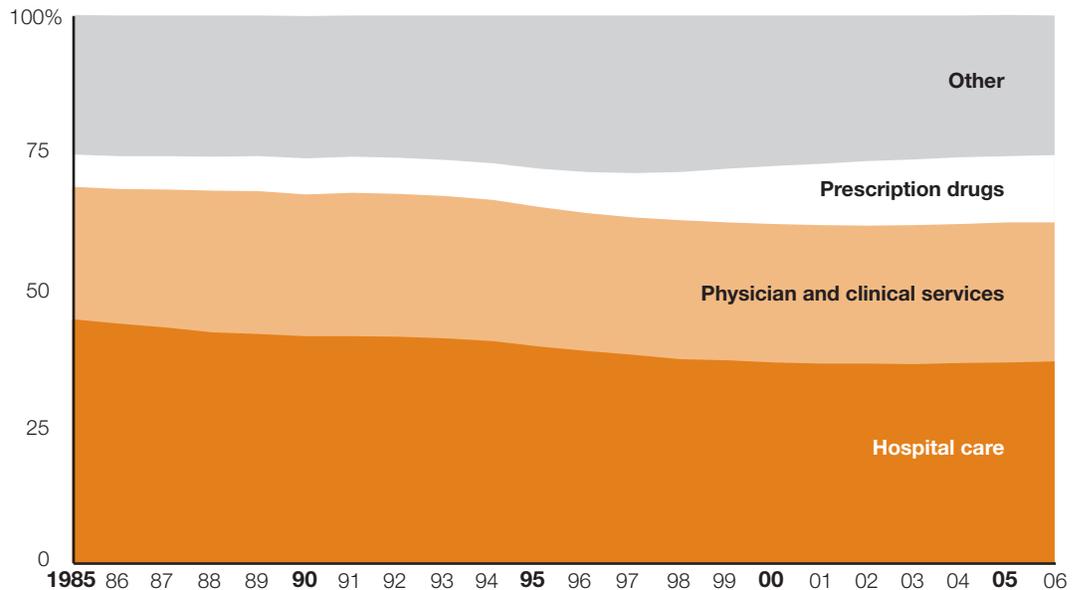
Source: Centers for Medicare and Medicaid Services, 2008 (12)

Hospital care and physician and clinical services are by far the two largest components of personal health spending, accounting for 31 percent and 21 percent, respectively, in 2006 (Figure 2) (9).<sup>4</sup> Prescription drugs account for only 10 percent of overall spending, although that is 40 percent higher than its share in 1970. Growth rates of the distinct components differ by time period, with the rank order often changing from decade to decade, but each of these three has had higher rates of growth than the remainder of health spending.

<sup>4</sup> The series most often compared to GDP is national health spending. But for analysis of components, the series on personal health spending (includes all of national health spending except program administration and net cost of private health insurance, government public health activities, and investment in research and in structures and equipment) is more appropriately used.

## Findings

Figure 2. Trends in Personal Health Care Spending, Distribution by Category, 1985–2006



Source: Centers for Medicare and Medicaid Services, 2008 (11)

CMS attempts to adjust health care spending for inflation by using a price deflator. For 1970–2006, CMS’ implicit price deflator for personal health care has increased more rapidly than the implicit price deflator for the entire GDP—5.9 percent versus 4.1 percent per year, suggesting that increases in prices as well as in quantities of services are important factors in explaining why health spending trends are higher than trends in GDP (11). If productivity trends were lower in health care than in the rest of the economy, which could come from weaker incentives to increase efficiency, this could explain at least a portion of the difference. Cutler et al. (21) argues, however, that typical measures of health care price trends overstate them because of the lack of adjustment for quality, so that a portion of increasing prices reflect improvements in the product. Indeed, they estimate that for heart attack treatment, between 1983 and 1994, the inflation-adjusted price for a quality-adjusted life year declined 1 percent annually. This type of analysis, however, runs the risk of having focused on a treatment area in which advances in medical technology have been unusually successful in increasing quality.

Out-of-pocket spending (as a percentage of national health spending) has declined over time from 33 percent in 1970 to 14 percent in 2001 to 12 percent in 2006, with this trend continuing in recent years despite the shift to increased patient cost sharing in private health insurance (9). Indeed, according to these data, out-of-pocket spending since 2000 has grown even more slowly than GDP. Some other data sources provide a different take on this. For example, Wall Street analysts’ surveys of insurers to estimate “benefit buy downs,” jargon for increased patient cost sharing, have documented that the percentage of spending for covered services paid by patients with employer-based coverage has been increasing since 2002.<sup>5</sup> This development applies only to services covered by employer-based health insurance, so it may not be inconsistent with the NHEA data, which cover spending for all services, not only those covered by insurance, and by all persons, including those covered by public insurance.

5 Based on the author’s reading of these reports, which tend not to be publicly available.

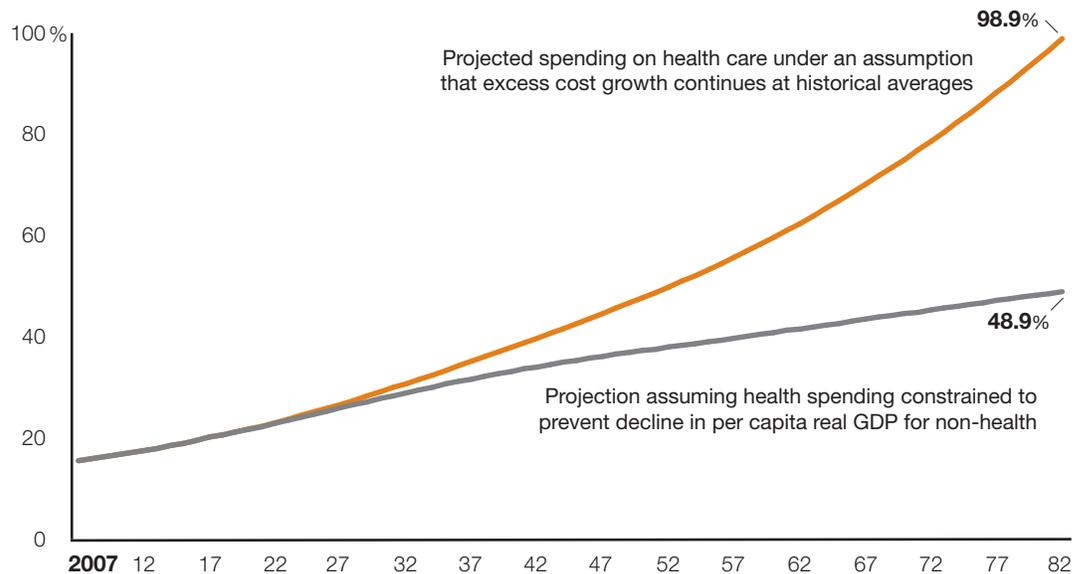
## Findings

### Long-range spending projections

Each year, the CMS Office of the Actuary publishes a 10-year spending projection. In the most recent projection, from 2007 to 2017, CMS expects U.S. health care spending to almost double from roughly \$2.2 trillion to \$4.3 trillion, while the share of GDP devoted to health care is expected to grow from 16.3 percent to 19.3 percent. This implies health spending growth outpacing growth in GDP by 1.9 percentage points per year, a somewhat smaller gap than the historical average, although still very large (47).<sup>6</sup>

Forecasts for longer periods start with the premise that extrapolation of current trends will produce implausible results, such as almost the entire GDP going to health care, so they work from the other direction, considering how much health spending growth society will tolerate. This leads forecasters to conclude that both private and public sectors need to take far more aggressive actions to control spending than has been the experience to date. The Congressional Budget Office (CBO) recently published such a forecast, assuming that spending for goods and services other than health care does not decline in real terms from the present time (Figure 3) (15). Under the CBO assumptions, health spending reaches 49 percent of GDP in 2082. This implies that between 2018 and 2082, health spending would increase only 1 percentage point more rapidly than GDP on average compared to a historical trend of 2.5 percentage points.

Figure 3. Projected Spending on Health Care as a Percentage of GDP



Source: Congressional Budget Office, 2007 (15)

Note: Excess cost growth refers to the number of percentage points by which the growth of spending (per capita) is assumed to exceed the growth of nominal gross domestic product (per capita).

The CMS Actuary traditionally assumed that spending per person would grow at the same rate as GDP because a gap could not be sustained by the economy—and thus would not occur (8). In its 2002 Medicare Trustees report, however, it changed the assumption to a 1 percentage point gap.<sup>7</sup>

<sup>6</sup> A lower projection of prices explains a portion of the gap projection being somewhat smaller than in the recent past, but reasons for this were not offered.

<sup>7</sup> The change was made in recognition of the powerful forces behind more rapid health spending growth, especially technological change. The reasoning of a technical review panel that advised the Actuary emphasized why 1 percentage point was more reasonable than zero, rather than why 1 percentage point was the best estimate (82).

### Are health care costs too high?

Nobody asks whether spending on computers or automobiles is too high because only private purchasing decisions are involved. Consumers decide what they want to buy, based on their preferences and their budgets. If spending on computers increased sharply, most would label this a success story, meaning that improvements in the products were so meaningful to consumers that they have decided to sacrifice other goods and services to spend more on computers.

Health care does have some critical differences, however. For one thing, much of it is paid for by private or public health insurance. This means that patients are shielded from most of the cost implications of their decisions—or their doctor’s decisions—at the point of service. Health insurance products have long had features, such as administrative controls, to restrain somewhat the effects of these incentives. In addition, consumers do not perceive themselves to have as much control over spending on health care because of their dependence on physicians and standards of care to determine diagnosis and treatment. Although service providers outside of health care also have incentives to convince consumers to spend more, health care professionals are likely to have more influence because of consumers’ limited technical knowledge and the urgency, fear and pain involved in many medical episodes.

Given these circumstances, some economists are unwilling to accept the current proportion of GDP spent on health care as optimal. It has motivated many to focus on the value of additional units of health spending in relation to costs as well as the burdens of increases in spending (meaning what must be sacrificed) on those individuals, businesses and governments that pay for health services.

### Issue of value

In recent years, some economists have estimated large values—in terms of increased longevity—for some new technologies and cautioned that cost-containment policies could diminish the rate of development of valuable technologies.<sup>8</sup> They have measured additional longevity from specific new technologies and assigned a value to them, using the concept of quality-adjusted life years (QALY). Two significant issues arise with analyses of value of new technology. One is that while a technology may be valuable in the aggregate, it is often applied to some patients obtaining very large value and others gaining little value or even being made worse off. Many valuable technologies have been applied too broadly, for example the use of the drug Vioxx by many not expected to benefit from its unique characteristic of causing fewer gastrointestinal problems than existing drugs. Similarly, some have questioned the use of angioplasty for some patients for whom medical treatment (drugs and lifestyle changes) would be at least as effective. So evidence of the aggregate value of a technology does not justify all of its applications. According to Garber, Goldman and Jena (35): “The variability in benefits that different patients achieve from similar interventions is at the heart of the conflicting views of the value of medical technology.” Championing technology does not have to be inconsistent with advocating vigorous attempts to limit use to patients most likely to benefit.

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<sup>8</sup> See, for example, Cutler (19) and Lichtenberg (52).

## Findings

Researchers may have a tendency to study only the most successful technologies, if only because they are better known. We do not know how much is spent for technologies that are less well known and whether they are less valuable. Indeed, Skinner, Staiger and Fisher (75), using data from later years, estimated a far lower value for innovations to treat heart attacks than did Cutler and McClellan (20).

Analysis of the extensive variation in rates of use of services across geographic areas within the United States is increasingly contributing to discussions of the value of additional spending on health care. Much of the research has focused on the Medicare program, which has uniform coverage throughout the country (except for private supplemental coverage and dual eligibility for Medicaid). A synthesis by Marsha Gold (42) describes the extensive variation in Medicare spending by hospital referral region, with half the variation not explained by population characteristics or prices. Those residing in high-cost regions did not receive better care or have superior outcomes. Fisher et al. (33), included in the Gold synthesis, showed that the 60 percent higher utilization in higher spending regions was explained by more frequent physician visits, especially in the inpatient setting, more frequent tests and minor procedures, and increased use of specialists and hospitals. Quality of care was no better.

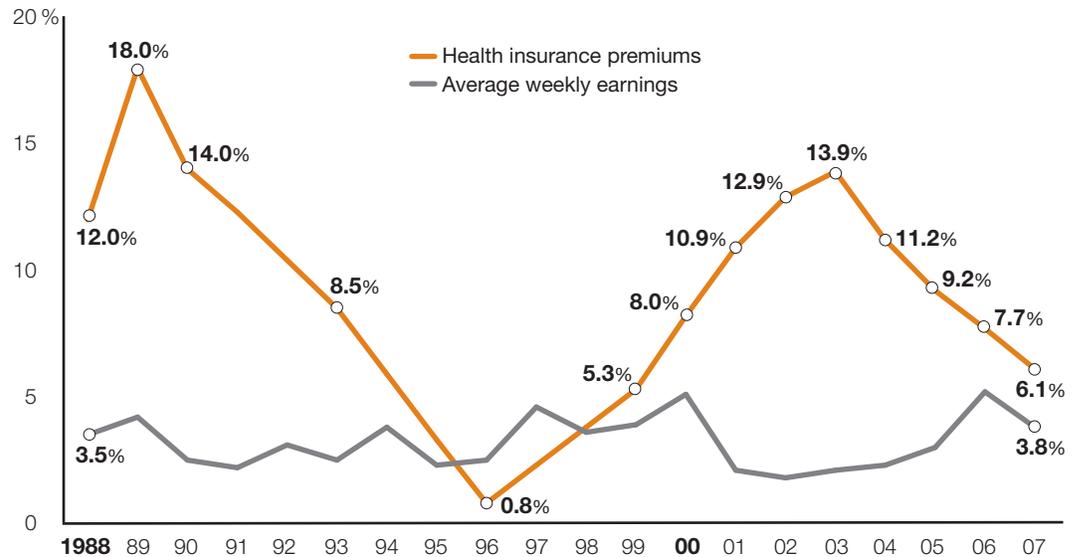
One striking consideration about the literature on the value of new technology is the lack of discussion about the implications of the results. For example, studies of the value of new technologies for heart attacks or of new drugs presumably are not addressing a policy option of banning those technologies. The subtext is whether steps that would make new technologies less profitable for their developers—for example, through guidelines leading to their being applied to fewer patients—would reduce the development of the valuable new technologies. Although it goes without saying that less profitable research and development will reduce resources going into these activities, it is far less certain that it would reduce the flow of high-value new technologies. The law of diminishing marginal returns certainly applies to research and development, so whether this would occur would depend on the skill of those who allocate capital to different research and development projects in identifying those projects with potential for the highest value.

### Issue of affordability

Research on the value of new technologies strikes some as quite academic. When health care spending rises substantially more rapidly than GDP, insurance premiums rise more rapidly than earnings. In recent years, the gap between premium trends and earning trends has been particularly large, so that the inability to afford health insurance now affects many in the middle class (Figure 4). For many, whether advances in medical technology are valuable or not has little relevance if their inability to afford insurance puts those technologies beyond their reach.

## Findings

Figure 4. Average Percentage Increase in Health Insurance Premiums Compared to Workers' Earnings, 1988–2007



Sources: Kaiser Family Foundation and Health Research and Educational Trust (46); Bureau of Labor Statistics, Non-Seasonally Adjusted Data from the Current Employment Statistics Survey, 1988–2007 (April to April).

Note: Data on premium increases reflect the cost of health insurance premiums for a family of four. The average premium increase is weighted by covered workers. Data on premiums not available for 1991, 1992, 1994, 1995, 1997, 1998.

Many societies have values that lead to efforts to ensure universal access to some standard of care, even if those with the highest incomes can access additional care. In the United States, public policy reflects this by use of taxes to fund public insurance for the elderly and some poor, particularly children, and through support of the safety net hospitals and community health centers that serve predominantly low-income people. When costs rise more rapidly than incomes, financing of these activities becomes more challenging. Maintaining this policy will require subsidizing coverage for those no longer able to afford it and higher outlays in relation to revenues for existing commitments. The result is either crowding out of other public priorities, higher taxes or, at the federal level, larger deficits. When health spending increases more rapidly than growth in incomes, it has important fiscal ramifications for government, for those who depend on government programs and for those who pay taxes.

Another complicating perspective is that in most advanced countries most people use the same medical care delivery system, implying generally the same standard of care for those who access the system. This leads, theoretically at least, to conflict over the level of spending incurred between those with different means. A market resolution to this issue would involve a splintering of the delivery system into subsystems that deliver different standards of care. This is probably happening in the United States to a much larger degree than in other advanced countries, where health insurance tends to be comprehensive for all people. Unconstrained growth in health spending in the United States will inevitably lead to fragmentation in the delivery system according to the ability to pay, something that at least some leaders would see as a negative.

## Findings

A distinct issue in affordability of health care is tied to the financing of coverage by employers. Many leaders of industry maintain that rising health insurance premiums hurt the competitiveness of American companies. They claim that it drives total compensation costs higher and reduces profitability in industries facing international competition, where prices cannot be raised (51). Most economists have been skeptical of this argument, since economic theory predicts that employers would shift rising costs of employee health benefits to employees through lowering other components of compensation, such as cash wages (68).

Some economists perceive that the opinion of business leaders has some merit due to institutional constraints. Nichols and Axen (61) demonstrate how during periods when the gap between premium trends and earning trends is very large, it would take a decline in nominal wage rates to fully shift increasing costs of health insurance to workers. Although wage cuts are theoretically possible, experience shows great resistance to them.

### Source of job creation?

Those who attend meetings of local business leaders are very likely to have heard the argument that health care is an economic engine for the community, creating well-paying jobs for local residents. In certain areas, such as those that attract patients from all over the nation or the world for tertiary care or are centers of biomedical research and development, this is likely to be the case. The argument may also apply to a chronically depressed locality, where the benefit of additional Medicare and Medicaid spending is likely to offset the negative effect on the local economy of higher insurance premiums.

At the level of the entire nation, in times other than recessions, however, the story is different. If people spend more money on health care, they have less to spend on other goods and services. So jobs gained in health care are likely to come at the expense of jobs elsewhere in the economy. Pauly (65) argues that the impact of shifting resources from health care to other goods and services depends on the value of health care, which could be lower at the margin as a result of the extensive use of health insurance. Monaco and Phelps (57) model changes in health care spending and its effect on the role of government in the economy. If higher spending for Medicare and Medicaid leads to higher taxes, the loss of efficiency from higher tax rates will mean that higher spending detracts from the economy. Indeed, to the degree that rising health care spending hurts the competitiveness of American companies that compete internationally, rising spending on health care could be an even larger negative factor for the U.S. economy.

### How does U.S. health care spending compare with that of other developed nations?

The question of whether U.S. health care costs are too high is the motivation for most analyses of international differences in spending. Many analyses have shown that per capita costs in the United States are much higher than those in other developed countries. These differences remain after adjustment for national incomes—and this is without taking into account that most other developed countries have universal coverage. The implication is that other systems are more efficient in providing health care to their populations and that U.S. spending is higher than it should be.

Drawing on data on spending created by the Organization for Economic Co-operation and Development (OECD) (63), numerous analyses have shown that health care spending in the United States is much higher than in the rest of OECD countries. For example, in 2006, U.S. spending

## Findings

was 15.3 percent of GDP, compared to an average of 8.9 percent of GDP for all OECD countries.<sup>9</sup> Many researchers have concluded that despite the difference in spending, growth trends have been similar (40). A recent study suggests, however, that the U.S. trend has been higher than the OECD trend since the mid-1980s (89). Decomposing the spending trend for 1970–2002 into population aging, economic growth and a residual called “excess growth,” and using data on aggregate OECD spending rather than the median OECD country, the study finds that excess growth was similar for 1970–1985 (U.S. 2.0 percent, OECD 1.7 percent), but fell to 0.6 percent for OECD for 1985–2002 while the U.S. continued at 2.0 percent.

An extensive literature has examined a number of possible explanations for the differences; a recent comprehensive study by McKinsey Global Institute (MGI) (5) extended the number of explanations. The literature suggests that prices, efficiency and insurance administration are the most important differences. MGI estimates that drug prices are 70 percent higher in the United States compared with OECD countries. Physician compensation in the United States is 6.6 times per capita GDP for specialists and 4.2 times for primary care physicians, compared to ratios of 4 and 3.2 in the comparison OECD countries. Salaries of nurses are in line with OECD countries. The United States spends 54 percent more than OECD countries for the top-five inpatient medical devices (e.g., implants, stents). Anderson and others (4, 2, 3) explain that single-payer systems effectively exercise monopsony power in setting payment rates for providers, which fragmented U.S. payers cannot muster.

The MGI study also compares efficiency across OECD countries. U.S. costs in outpatient settings are higher because of subscale operation of facilities. With prices very high, outpatient facilities in the United States can earn a profit despite underutilizing capacity. In contrast to hospital CT equipment being used for 20–30 scans per day, freestanding outpatient facilities, which have lower overhead, can earn a profit at 4–8 scans per day. This leads to extensive investments in inefficiently used capacity—and a likelihood of higher service use in response to physician self-referral incentives.

Advocates of single-payer systems have long pointed to higher insurance administrative costs (marketing and sales, underwriting, claims processing, utilization review and profits) in the United States, often comparing them to Canada (90). This and earlier work by Woolhandler and Himmelstein (91) attracted a great deal of criticism, dwelling on the likelihood the differences are overstated and pointing out that U.S. political history and institutions would require even a feasibly reformed U.S. health care system to spend more on administration than Canada’s system (1, 24, 74). MGI estimated that the United States spends six times more for administration than OECD countries, not including the costs borne by providers in interacting with payers.

### **What is driving the growth in health care spending?**

An extensive literature examines which factors play the largest roles in explaining increases in health spending over time. Conclusions about which drivers are most important have been very consistent from study to study. For example, authors agree that technological change is the most important driver of spending increases over time and that population aging plays only a minor role (Table 1).

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<sup>9</sup> Calculations by the author. Note that while the OECD data for the United States is based on NHEA data, adjustments are made to be comparable to data on other nations.

## Findings

Table 1. Estimated Contributions of Selected Factors to Growth in Real Health Care Spending Per Capita, 1940–1990

Drivers of Cost Trend	Studies Estimating Contributions of Selected Drivers		
	Smith, Heffler and Freeland (2000)	Cutler (1995)	Newhouse (1992)
Aging of the Population	2%	2%	2% <sup>a</sup>
Changes in Third-Party Payment	10	13	10 <sup>b</sup>
Personal Income Growth	11–18	5	<23
Prices in the Health Care Sector	11–22	19	*
Administrative Costs	3–10	13	*
Defensive Medicine and Supplier-Induced Demand	0	*	0
Technology-Related Changes in Medical Practice	38–62	49	>65

Notes: Amounts in the table represent the estimated percentage share of long-term growth that each factor accounts for.

\* = not estimated.

<sup>a</sup> Represents data for 1950–1987

<sup>b</sup> Represents data for 1950–1980.

Source: Congressional Budget Office, 2008 (17) based on Smith (79), Cutler (19) and Newhouse (59)

**Technology.** Measuring the contribution of changing medical technology is particularly challenging because of the inability to measure aggregate technological change directly. Nevertheless, all of the studies reviewed obtain broadly similar results. Most studies measure technology as a residual; that is, after estimating the contributions of all of the directly measurable drivers of spending, attributing the proportion of spending increases not otherwise explained as the contribution of technology. These approaches are vulnerable to confounding technological change with other factors for which the contribution is not fully captured (or measurement errors). For example, the role of increasing rates of obesity has not been studied until recently, so some of its impact on spending may have inadvertently been attributed to technology. In addition, separating the effects of technology from health insurance coverage is problematic because the contribution of technology would not be as great had the technologies not been covered by insurance.

A frequently cited study by Newhouse (59) attributes the bulk of the more than half of spending increases that could not be explained by other factors to technological change. Peden and Freeland (67) attribute about two-thirds of spending increases from 1960 to 1993 to technological change. Smith, Heffler and Freeland (79) and Cutler (19) also attribute substantial portions of spending increases to technological change. A technical review panel convened to advise CMS on future health care cost trends concluded that about half of real health expenditure growth is attributable to technology (82).

A few studies, instead of estimating a residual, use proxies for technological change. Okunade and Murthy (62) use health care research and development spending as a proxy for technological change. Analyzing time series data from 1960 to 1997, they do not suggest a particular percentage but support Newhouse’s conclusion that “technological change is a major escalator of health care expenditure.” Di Matteo (27) uses a time trend to proxy technological change and estimates that it accounts for 62 percent of the increase in spending. With such similar research results across studies, little is to be gained at this point by debating the contrasting methodologies.

Cutler and McClellan (20) outline lucidly how technology advances affect aggregate spending trends through either treatment *substitution* or *expansion*. Treatment substitution can, in different cases, either increase or decrease spending. Examples of advances that increased spending per patient through treatment substitution are new treatments for heart attacks and breast cancer.

## Findings

Examples where lower-cost treatments were substituted include cataract surgery, where advances in technology made the surgery a simple outpatient procedure, and treatment for depression with selective serotonin reuptake inhibitors (SSRI), where psychotherapy was reduced or eliminated. Treatment *expansion* occurs when treatment becomes more attractive to patients because of either better outcomes or reduced pain or disability connected with treatment. Treatment expansion almost always increases spending (some preventive services would be exceptions, although most effective preventive services increase spending (70)). Treatment substitutions that decrease costs often stimulate large treatment expansions, since lower unit costs often go along with reductions in pain and disability, as with cataract surgery and minimally invasive gall bladder surgery.

The contribution of technological change to spending probably varies by time period. For example, drug spending trends, which are highly influenced by technological change, have been low in recent years—after being particularly high during the 1990s—due to a combination of relatively few approvals of “blockbuster” drugs and older drugs coming off patent. The genomic revolution could lead to sharply higher drug spending down the road, with recent rapid growth of spending on biologics an early indication of that trend.

**Demographics.** The literature on the role population aging plays in spending trends is extensive and highly consistent. Most of the studies use survey data on spending per capita at different ages and combine that with data on demographic trends. All of the studies reviewed project contributions of aging to spending trends of less than 0.7 percentage point per year, with the more sophisticated studies tending to get the lower numbers.

Differences in results across studies often reflect differences in the period studied. Studies examining the period before baby boomers began reaching their mid-50s obtain smaller impacts than those focusing on the very recent past or making projections. Strunk and Ginsburg (80) focused on commercial insurance premiums and estimated the contribution of population aging to spending growth at an average 0.1 percentage point per year in the early 1990s, rising to 0.7 percentage point in 2001 and continuing at that rate throughout the current decade. Martini et al. (54), using a health plan’s administrative data, estimated that population aging will contribute 0.3 percentage point per year from 2000–2050.

Studies that incorporate high spending in the last year of life and project a continuation of increasing life expectancy get even lower estimates of the impact of aging. For example, Seshamani and Gray (72) find that their estimate of increasing spending due to aging in England was halved to about 0.4 percentage point per year for 2002–2026 by incorporating the end-of-life dimension. Cutler and Sheiner (22), who focus on Medicare spending, find that between 1990 and 2030, the percentage of Medicare beneficiaries in their last year of life will decline from 5 percent to 4.2 percent. The impact of increasing longevity swamps the 0.14 percentage point per year estimate for the role of aging in Medicare spending trends for 1992–2050 that they estimate assuming constant life expectancy.<sup>10</sup>

Some studies have focused on differences in trends in health care spending by age group, raising concerns that spending per capita is increasing more rapidly for older people (73). More recent research casts doubt on those findings, however (55).

With the literature generally consistent in showing the effect of aging on spending is small, it is important to examine the enormous gulf between the beliefs of health care providers and the research. Commonly, hospital leaders justify expansions based on “aging baby boomers.” This

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<sup>10</sup> These analyses of the role of aging to Medicare costs do not include the large portion of long-term care not covered by Medicare.

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prompted research focused on the role of aging in the demand for inpatient hospital services (81), which obtained results similar to earlier studies of only a small effect.

**Health Status.** Using data from the 1987 National Medical Expenditure Survey and the 2001 Medical Expenditure Panel Survey, a well-known analysis by Thorpe et al. (83) attributes 27 percent of increased inflation-adjusted spending from 1987 to 2001 to increasing rates of obesity and changing patterns of obesity treatment and associated conditions. Increasing incidence of obesity contributes only 12 percentage points of the 27 percent; the remaining increase results from changing treatment patterns, which would more appropriately be classified as a contribution of technology (17).<sup>11</sup>

Analyses that do not factor in life expectancy changes from trends in health status will tend to overstate the contribution of health status to spending trends. Van Baal et al. (87) highlighted how effective steps to reduce obesity would reduce spending in the short run but increase spending in the long run because of increased longevity and the resulting exposure to other illnesses. Simulating a cohort of 20-year-olds, those who are obese had the highest costs up to age 56. At older ages, smokers had the highest costs. But over a lifetime, neither obese people nor smokers were the most expensive. Possible implications of these results are that reductions in spending from declines in rates of smoking are mostly behind us, while the higher spending from increased longevity will predominate in the future, and reversing the trend toward obesity would lead to reduced spending for a long period until the effects of greater longevity eventually dominate.

**Health Insurance.** Most actuaries and budget analysts draw on the RAND Health Insurance Experiment to develop assumptions about the impact of changes in insurance benefit structure on medical care spending by a small group of enrollees (60). CBO (17) asserts that under such a standard model, increased insurance coverage explains 10 percent to 13 percent of the long-term spending trend. However, the proportion of the population with health insurance has been slowly declining over time, so this factor will affect future spending only if policies are enacted to increase the proportion of the population covered by health insurance. Indeed, it is likely that changes in insurance coverage during this decade have slowed the rate of health spending growth rather than been a driver.

The question of the role that insurance plays in cost trends at the market level—rather than individual level—is much more complex. Newhouse outlined different possible mechanisms through which the amount of insurance could affect health care spending (58). The traditional mechanism—the level of insurance coverage (or proportion of spending paid by insurance) influences the level of spending—does not address market dynamics in which the extent of insurance coverage influences the degree of development and introduction of new technology and affects prices charged by providers and the expensiveness of their approaches to treatment. Peden and Freeland (67) followed the Newhouse framework in explaining increases in spending by including both the average coinsurance rate and its percentage change in their model for changes in spending. The percentage change in coinsurance turns out to be the more important insurance variable, explaining 44.4 percent of spending increases.

To investigate the implications of large changes in health insurance on spending, Finkelstein (31) analyzed the impact of the implementation of the Medicare program on national health spending

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<sup>11</sup> If the relative spending for obese and normal-weight people from 1987 had been used, the impact of increasing obesity would explain 4 percent of increased spending. Using the 2001 relative spending rates would explain 12 percent. Standard index number procedures would calculate a geometric mean between the results based on 1987 weights and 2001 weights, which is 8 percent. But the 2001 weights are most relevant for forecasting the role of obesity in the future—and obesity prevalence continues to increase (10).

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and estimated that the creation of Medicare led to a 37 percent increase in inflation-adjusted hospital spending (by all patients)—six times the increase that would be expected on the basis of the results of the RAND Health Insurance Experiment. This was an example of changes in insurance coverage for a large segment of the population—the elderly—fundamentally affecting the character of medical care for all. She estimated that changes in insurance coverage may be responsible for half of the increase in spending from 1950–1990, an estimate that is consistent with that of Peden and Freeland.

Finkelstein suggests two models for how insurance coverage affects spending. A “fixed-costs” model has aggregate changes in health insurance sufficiently changing market demand to get hospitals to incur the fixed costs of entering a market or adopting new practice styles. A “spillovers” model has changes in insurance for one group of patients influencing treatment of other patients.

A summary of the evidence on the role of health insurance coverage in health spending shows two strands of thought. Standard assumptions about how a change in health insurance affects an individual’s spending on health care lead to a conclusion that health insurance is not a dominant driver of spending trends. But the literature also suggests that a change in health insurance affecting large numbers of people is likely to influence the care delivered to all people and influence technological change and even provider productivity.

In the future, a decline in the comprehensiveness of insurance coverage may lead to a reversal of the phenomenon Finkelstein described following the introduction of Medicare. The combination of benefit “buy downs” (increased deductibles, coinsurance and copayments), changes in benefit structures to encourage patients to choose low-cost providers, and increased information on provider prices and quality could change the market dynamic to one in which consumers become more judicious in incurring health costs. This is more likely to affect outpatient services than inpatient services because current benefit structures, including high-deductible plans, have not changed incentives for inpatient care substantially. If the trend toward greater financial incentives for patients is large enough, it may affect spending to a greater degree than standard assumptions would predict.

**Income.** Newhouse (59) synthesized the literature on the role of income in health spending. Estimates based on cross-sectional analysis of data on individuals tend to underestimate the magnitude of the relationship because poor health, which leads to high spending on health care, depresses income. Elasticities (the relationship between changes in income and changes in spending) from these studies tend to be in the 0.2–0.4 range. Studies using aggregate data, such as cross sections of countries, tend to obtain elasticity estimates of 1.0 or higher, suggesting that as income rises, the proportion of income spent on health care is likely to stay the same or increase. However, CBO (17) argues that the difficulties in undertaking cross-national comparisons may bias these estimates upward. It concludes that the literature discussed above implies contributions of income trends to health spending trends anywhere between 5 percent and 20 percent of long-term spending growth. The most recent econometric literature, using more sophisticated methods, consistently obtains elasticities below 1.0, implying that health care is a necessity rather than a luxury (84, 26, 34). An implication is that gains in income tend to ease the burdens of financing health care.

**Physician Specialty Mix and Supplier-Induced Demand.** A number of cross-sectional studies show that regions in which a higher proportion of physicians are specialists have higher spending, presumably because specialists practice a more expensive style of medicine—at least where they are in ample supply. Since the proportion of specialists in the overall physician workforce is increasing, this could be a driver of spending trends. Baicker and Chandra (7) use the Dartmouth Atlas to examine state-level Medicare claims data. They find that states with a higher

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proportion of specialists had higher spending and lower quality. Shifting one physician per 10,000 population from generalist to specialist increases spending per beneficiary per year by \$526.

Greenfield et al. (43) analyzed 20,000 patients who visited physician offices during a nine-day period in 1986 (Medical Outcomes Study) using self-administered questionnaires completed by both patients and physicians. A multivariate analysis with detailed patient information showed that patients seeing internal medicine subspecialists had higher rates of hospitalization, higher rates of prescriptions and higher rates of tests than those seeing general internists or family physicians.

Since the 1970s, economists have battled over whether variations in the supply of health care resources, such as hospital facilities and physicians, impact the use health services. The challenge is to separate out variation in supply from factors other than variation in patient demand—in other words, getting the causation right (50, 64). Dranove (29) criticized the econometric techniques used to attempt to establish causation by using them to analyze the impact of physician supply on childbirth and finding a significant but unlikely impact. The most recent published work is from Australia. Using newer theoretical models and econometric techniques, Peacock and Richardson (66) found a substantial impact of the supply of health care resources on the use of health services. Although supplier-induced demand tends not to appear on lists of drivers of spending trends because of the controversy about its existence or magnitude, even without inducement, increases in supply will likely lead to higher spending; policies to constrain supply, if effective, are likely to lead to constrained spending. However, in health systems in which prices are not controlled centrally, such as the United States, constraining supply is also likely to lead to higher prices for services.

**Productivity Trends.** The health care industry has many characteristics that would lead one to expect relatively small increases in productivity over time. For example, there tends to be little competition among providers on the basis of price. Extensive third-party coverage dilutes consumer incentives to be price conscious, and benefit structures tend to offer little reward for choosing a low-priced provider. On the other hand, Medicare administered pricing likely increases incentives to be efficient in producing individual services or, in the case of hospitals, admissions.

In a study for the Medicare Payment Advisory Commission, Lichtenberg (52) outlines a number of additional factors leading one to expect relatively low productivity growth in hospitals. These include high labor intensity, low investment in computers and software, and low investment in research and development, although one should raise the question of whether the latter two factors result from lack of incentives to increase productivity. He notes that government statistics on constant dollar output and American Hospital Association data on full-time equivalent staff suggest productivity growth at less than half the rate of the general economy.

Cutler and McClellan (20) note that from 1960 to 1999, the medical component of the Consumer Price Index exceeded the overall index by about 1.8 percentage points a year, suggesting either increasing market power on the part of medical providers or much lower rates of productivity increases. They suggest that the gap is due to lack of adjustment for quality increases, arguing that a quality-adjusted index for treatments for the conditions examined in the study would show productivity gains exceeding those for the economy as a whole.

Reflecting on these perspectives, one can conclude that most of the delivery mechanisms within health care are set up to have lower productivity increases than the general economy, but the health system also has a vibrant research and development component that over time creates more valuable treatments, many of which have higher quality or lower unit costs. The health care system, in turn, likely delivers these new technologies relatively inefficiently, both by using high

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levels of inputs per service and by using the technologies not only for patients who derive large benefits from them but also for those where the benefits are small or even negative.

**Managed Care.** Contributions of managed care to overall spending trends are covered in this synthesis mostly for historical reasons. The managed care of the 1980s and early 1990s, which was studied extensively, has long ago passed from the scene in response to an extensive backlash. In addition, because of data limitations, most of the literature defined managed care as health maintenance organizations (HMOs), entities that play a much smaller role in health care financing today. Instead of focusing on research on whether managed care reduced the level of spending, it is more useful to focus on whether managed care reduced the rate of spending growth. To put it differently, if a large stable part of the population had been served by HMOs, which clearly did have lower costs, would the rate of increase in spending be different?

Two excellent syntheses help to efficiently summarize this literature (41, 14). Glied raises a methodological concern with selection in the enrollment process. If managed care plans experience favorable selection, their growth will lead to higher cost trends for other plans and too high a measured difference in trends. More recent studies show a larger cost growth difference—about one percentage point per year—than studies using data from the early 1980s.

Glied notes that Cutler and Sheiner (23) is the only study to address the impact of managed care on technology diffusion. That study showed that states with high managed care penetration went from being first adopters to average adopters of new technology, suggesting potential—for better or for worse—of managed care slowing development or diffusion of new technology.

A synthesis by Chernew et al. (14) contrasted studies of health plans with studies of markets. The former did not show differences in cost growth but the latter did. He raised the prospect that other health plans benefited from spillovers from managed care, resulting in market comparisons looking more favorable to managed care's ability to slow cost growth than plan comparisons. Spillovers can occur from doctors treating all of their patients the same way, higher penetration by HMOs benefiting preferred provider organizations (PPOs) in provider negotiations, and the possibility that managed care plans cause a change in the health care infrastructure.

Studies covering the late 1980s and first half of the 1990s may have been picking up a growing impact of managed care through that period as increasing plan market share increased negotiating clout with providers and, as Chernew et al. noted, affecting the whole infrastructure of delivery. This is not the same as managed care having the potential to affect the rate of growth of spending long term, however.

**Changing Market Structure and Entrepreneurship.** Markets for hospital care and for health insurance are becoming more concentrated over time. During the 1990s, many hospitals merged into systems, increasing their clout in local markets. A synthesis of the research on this question concluded that hospital concentration leads to higher prices (88). But considering the magnitude of the price increases measured, it is unlikely that the contribution of increasing concentration of hospitals is a major contributor to growth in health spending over time.

Health insurance also has become more consolidated over time. Mergers in the 1990s often increased concentration in markets. More recent mergers have not had that effect, perhaps due to antitrust restrictions. In recent years, however, mergers have involved national health plans acquiring regional plans in areas where they had only limited penetration. Because large employers increasingly want to contract with a single carrier, this has increased the advan-

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tage of being a large national plan.<sup>12</sup> This has led to a difficult business environment for local or regional health plans, increasing the shares of the dominant plans in local markets and increasing entry barriers.

Whether insurer concentration contributes to trends in overall spending is a difficult question. Increasing power in the provider market could lead to lower payment rates, but increasing power in the insurance market could preclude passing the savings on to purchasers, or even lead to higher premiums. Like hospital concentration, however, it is unlikely that insurer concentration is a major driver of cost trends.

**Medical Malpractice Liability.** Sloan and Chepke (76) estimate that over a 30-year period (1970–2000), medical malpractice premiums increased from 5.5 percent to 7.5 percent of total physician practice expenses, so premiums cannot be an important cost driver. Research on whether defensive medicine affects spending is challenging because liability risk pushes physicians in the same direction as fee-for-service payment incentives—providing more services. The best research has focused on comparisons of states with tort reforms with other states. As a result, its potential contribution is more to the question of why health spending is high than on why it is rising.

Kessler and McClellan (48) analyzed Medicare data for beneficiaries with serious heart disease and found that reforms that directly reduce liability pressure (such as limits on noneconomic damages) lead to reductions of 5 percent to 9 percent in medical expenditures. They conclude that liability reform can reduce defensive medicine.

Studies of obstetrics find smaller impacts (78, 30). Only the latter study, which focused on cesarean delivery rates, found evidence of defensive medicine, concluding that a total cap on damages would reduce cesarean deliveries by 3 percent and total obstetrical charges by 0.27 percent. A 2006 synthesis of this literature concluded that caps on noneconomic damages do reduce award size substantially, but the reductions in medical malpractice premiums are modest (56). Other tort reforms did not have significant impacts. A 2006 report by the Congressional Budget Office finds the evidence of impact of tort reforms to be inconsistent and dependent on particular relationships and specifications tested (16).

These results confirm that the shortcomings of the liability system are not an important driver of cost trends or even a large factor behind costs being high. Indeed, the literature emphasizes that the larger potential for true reform is in the area of better quality of care and more equitable compensation of those suffering large losses (77)

### What are the short-term spending trends?

Understanding the drivers of variation in the rate of spending growth over short periods of time is important, if only to reduce the risks of incorrectly concluding that changes in short-term spending or premium trends reflect changes in long-term spending trends.

**Business Cycle.** Forecasts of health spending rely on research indicating that a key driver is changes in the level of economic activity that occurred a few years earlier. For example, the CMS Office of the Actuary, which makes 10-year spending projections, uses a five-year moving average of income—the forecast year and the four previous years—to predict changes in spending (47).

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<sup>12</sup> Blue Cross and Blue Shield plans, which are regional, have achieved this advantage through their coordination, giving employers access to Blue networks all over the country.

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Getzen, who has contributed to this work over many years, also uses five years of income data in his forecasts of health spending trends for the subsequent five-year period (36).

Until recently, forecasters did not offer a theory behind this relationship. A recent discussion suggests that when income trends increase or decrease, private insurance will not change right away because of annual contracts, the lag between employers negotiating new insurance contracts and their taking effect, and the time involved in employers recognizing changes in income trends and devising new structures in their health benefits plan (13). For the public sector, there will be a lag between changes in revenues and policy changes either in public insurance programs or in broader regulation of the health care system.

**Rise and Decline of Managed Care.** The Center for Studying Health System Change (HSC) began its Community Tracking Study site visits in 1996, close to the peak of managed care. HSC has observed the extensive change in the delivery system to adjust to managed care, such as physician-hospital organizations and hospital acquisition of primary care practices, as well as the backlash against managed care and the subsequent abandonment of some of the tools used to control costs (37). Dranove et al. (28) tracked the last development quantitatively, concluding that insurer market power peaked in 2001. Looking at cost trends since the early 1990s, there is little doubt that the rapid growth of managed care at the time and the subsequent changes in managed care have had important effects on cost trends. The unusually low rates of increases from the early 1990s through the end of that decade and the high rates of increase at the beginning of the current decade were likely influenced by developments in managed care (Figure 2).

**Health Insurance Underwriting Cycle.** A well-documented phenomenon has been how health insurance premiums increase at faster or slower rates than the underlying spending trend for services covered by insurance. This underwriting cycle has tended to be six years long, with three years of premiums rising more rapidly than underlying spending followed by three years of premiums rising more slowly than spending (44). One factor behind the cycle is the lag between unexpected changes in the cost trend and their reflection in premium trends. Another factor is that when insurance is more profitable than average, health plans are more likely to aggressively seek to increase their market share in both existing and new markets, which then decreases the profitability in the industry, which leads to withdrawal from less profitable markets and less aggressive pricing.

Most observers believe that the amplitude of the underwriting cycle has moderated in recent years and will continue to do so. Electronic submission of claims and application of additional actuarial resources have reduced the time required for insurers to recognize changes in spending trends. Diversification of contract renewal dates has also allowed insurers to act more quickly when they perceive changes in spending trends (69). Grossman and Ginsburg (44) have described how local health insurance markets have become more difficult to enter because of factors such as larger local market share leading to more favorable discounts from providers and large employers increasingly contracting with a single insurer with strong provider networks in markets where employees reside. This has led to fewer efforts by insurers to enter new markets when coverage is particularly profitable, thus removing a key force behind the cycle. In mid 2008, Wall Street analysts believed that a long period of high profitability ended in 2007, but do not expect the cyclical decline in profitability to be large.

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### Conclusion

Costs are both high and rising rapidly. Key evidence on costs being high comes from analysis on variations in spending per person, both internationally (the United States has much higher costs than other advanced countries) and geographically within the United States. In addition, there is no evidence that better outcomes are associated with higher spending.

The dominant driver of long-term cost trends is advancing medical technology, where new options for diagnosis and treatment often replace older technologies that are less expensive or provide opportunities when none existed before. Advancing technology may have a particularly large impact on spending in the United States because of few requirements that effectiveness be demonstrated before technologies are used broadly and concern that their application tends to go beyond those patients likely to benefit the most from them. Other key factors are increasing rates of obesity and the likelihood that the delivery system is not generating increases in efficiency in line with the potential for such gains.

Long-range spending projections demonstrate that a continuation of existing trends will eventually lead to a situation in which spending on health care rises so rapidly that consumption of other goods and services will decline. This forecast makes grappling with rising spending essential.

## Implications for Policy-Makers

Policy-makers have good reason to take steps to slow the rate of increase in health care costs. The substantial gap between trends in spending for health care and trends in income is eroding the private financing of health care, making coverage unaffordable to more people each year. It is also placing a great deal of stress on local, state and federal budgets, where revenue growth tends to be in proportion to growth in income. The erosion of private financing is placing additional pressure on governments, which are being called on to expand their programs. These financing challenges are leading to a harder look at the value of health care. Although much of medical care is highly valuable in terms of better outcomes, there is increasing evidence of care that has low value or is even harmful to patients.

### Addressing medical technology

Advancing medical technology has been the most important driver of the spending trend. The policy challenge is to reduce growth of spending for marginal—or low-value—applications of technologies, while leaving opportunities for high-value technologies to be developed and employed in practice. Indeed, it is not the technologies themselves that should be labeled high or low value but the combination of a technology and what it accomplishes for different groups of patients.

Three major policy options have the potential to address advancing technology in this way. One is for the federal government to sharply increase its funding for research on effectiveness. This is the beginning of an approach that supports the differentiation between technologies and patient applications that have high or low value. Two aspects of such a policy are needed for this to be effective. First, a governance structure needs to be established to provide insulation of this activity from narrow political pressures. The entity that manages the research effort needs to feel confident that research results that are unfavorable to technologies developed by a powerful stakeholder will not jeopardize its future funding. Second, the research needs to focus not only on effectiveness but also on costs of care associated with a technology. The opportunities to reduce growth in spending on the basis of technologies that are found to harm patients are unlikely to be large enough to meaningfully address the problem of rising spending. The research will need to differentiate between those technologies that require \$10,000 to produce a quality-adjusted life year (QALY) and those that require \$1,000,000.

A second policy option to address advances in technology is provider payment reform. Distortions in the structure of relative payments for hospitals and physicians from their intended paralleling of the relative costs of providing different services give an inadvertent incentive for providers of services to favor those services that are most profitable. Those services that have become relatively profitable as a result of these distortions in payment structure tend to incorporate new technologies (39).

The third policy option involves consumer incentives and support. To the degree that consumers bear some of the financial risk of medical spending, they are likely to be more judicious concerning the use of technologies that are likely to have low value to them as patients. Those with private insurance have begun to face increasing amounts of patient cost sharing. The federal government can promote increased use of consumer financial incentives by changing the tax treatment of health insurance. When health insurance premiums are paid mostly or entirely from pre-tax income, the incentive is to choose a benefit structure with little patient cost sharing or other restrictions on care. In recent years, this option has been seen as part of a strategy of consumerism in health care, which is broader than patient financial incentives. It also involves supporting patients with information on treatment alternatives and their effectiveness, on the

## Implications for Policy-Makers

quality of different providers of care, and on the prices of each. Incentives to choose lower-priced providers have the potential to influence a much higher percentage of spending, but will be more effective under a reformed provider payment system, where prices are for broader units of service, such as an episode of care. Value-based benefit design can support consumer choice by varying the degree of patient cost sharing according to assessments of the value of different types of services. Increased research on effectiveness is clearly an underpinning of this policy option.

### Reducing obesity and improving wellness

Obesity was also mentioned as an important driver of health care spending. Efforts to slow or reverse increasing rates of obesity have the potential to lower health spending trends. It would be better to broaden this option to health promotion and wellness in general. For example, obesity is likely to contribute less to cost trends if the hypertension and diabetes that are associated with it are better controlled. Encouraging overweight people to exercise more would likely reduce spending even if it does not succeed in lowering weight. In addition, there are opportunities to address other aspects of poor health that lead to higher spending, such as depression.

### Improving efficiency

This synthesis suggested that suboptimal gains in productivity in the delivery of health care are a possible cost driver. For example, if the efficiency of delivery of services could be increased by 20 percent over 10 years, this would roughly close the gap between spending growth and GDP over that period. Indeed, the very large gains in productivity in manufacturing come from continuous implementation of discrete changes in processes that reduce the level of costs of production. To the degree that this happens year after year, it is because of a management process that continually applies resources to search for additional opportunities to reduce the level of costs.

Additional aspects of provider payment reform could lead to gains in productivity. To the degree that provider incentives are changed from those most common today—which produce individual services efficiently but generate more services—to those that focus more on accomplishing what patients need, productivity could increase. Payment mechanisms potentially more consistent with efficiency include a single per episode payment that goes to all providers involved in a major acute procedure and capitation payments to a medical practice for the management of patients' chronic diseases (38). The patient-centered medical home, a concept that has received substantial attention, can be seen as an initial step toward the use of capitation payment for chronic disease. For prescription drugs, some propose increasing efficiency by separating research and development from marketing and distribution (32).

### Addressing supply side drivers

Provider and facility supply was mentioned as a possible driver. The literature on the impact of state certificate-of-need (CON) laws on health care spending has not provided support to the notion that these activities succeeded in suppressing spending (71, 6, 18). The best policy opportunities in this area might include provider payment reform, which would remove the inadvertent incentives to become a specialist or invest in profitable equipment, and increasing financial incentives for patients. For example, lower payment rates for imaging might accomplish much more in reducing rates of low-value imaging than would attempts to constrain supply. Changes in laws applying to physician self-referral might also effectively impact supply.

## Implications for Policy-Makers

### Tightening administrative costs

Administrative costs were noted as a key reason why spending in the United States exceeds that of other advanced countries. Some of this is embedded in multi-payer versus single-payer systems. Although the U.S. commitment to the former is unlikely to change in the near future, a multi-payer system can be made more efficient. For example, creation of insurance exchanges could reduce distribution costs of insurance purchased by individuals or small employers. Opportunities likely exist, especially in Medicare, to spend more on administration and save money overall through lower benefit payments. Although health plans abandoned many administrative controls in the wake of the managed care backlash, some are being reintroduced in a more targeted and less intrusive manner, such as prior authorizations for imaging and limiting imaging facilities in networks to those meeting quality standards (85).

This list of policy options to address the various drivers of rising costs is certainly not exhaustive. Some options where the potential to reduce costs is more uncertain may have a strong basis for being pursued nevertheless. Examples include expansion of health information technology, which is likely to improve quality of care and might reduce costs at the same time, and medical liability reform, which has the potential to more efficiently compensate injured patients and more effectively deter poor quality.

## The Need for Additional Information

The area covered by this synthesis that is least understood is medical technology. Since the medical care system addresses so many different health problems, most new technologies will be applicable to a very narrow segment of health care. The need to aggregate so many technologies in order to understand trends is daunting. Traditionally, the result has been almost no research on societal perspectives on technological change in medicine. Today, this has evolved to research on selected technologies, but the process of selecting technologies is so unstructured so as to leave real concerns about how representative those technologies are.

Overall our understanding of high and rising costs is fairly solid. Our most pressing needs are not as much on the research side as on the development side; that is, all of the technical work needed to pursue many of the reforms to the health care system that are seen as long-term approaches to address health care costs. For example, value-based benefit designs need extensive development. Paying multiple providers for acute episodes of care requires advances in patient classification and risk adjustment. Paying for medical homes similarly needs better risk-adjustment models and the gathering of data on resources that go into care coordination. To put it differently, existing research has given us a satisfactory understanding of the problem. Now the energies of researchers should be directed toward developing and implementing solutions.

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