

# PERSPECTIVE

## Health, Technology, And Medical Care Spending

Neither new health-enhancing technologies nor improved functional status at age sixty-five is likely to relieve the budget pressure on Medicare.

by **James Lubitz**

**ABSTRACT:** The RAND Future Elderly Model illustrates important principles about the relation among medical technologies, health spending, and health. New technologies add to spending because the costs of the new technologies and the health care costs during the added years of life they bring outweigh reductions in annual spending from better health. Many technologies with a low cost per patient per year result in high aggregate costs because of an expanded population being treated. However, the jury is still out on whether a better health-risk profile among future sixty-five-year-olds could moderate health spending for the elderly.

The only way to spend less is to spend less.  
—Anonymous

AS A PERCENTAGE OF gross domestic product (GDP), health spending in the United States rose from 5.7 percent in 1965 to 14.9 percent in 2002, with technological changes accounting for at least half of the growth.<sup>1</sup> Demographic trends contributed little to the increase, but the aging baby boomers will drive future increases as they enter Medicare. Postwar America experienced a societal transformation (suburbia, television, integration, widespread college education, and so on). Part of this transformation was a remarkable revolution in the health sector, with the expansion of health insurance and advances in medicine. Computed tomography (CT) scans, organ transplants, arthroscopic surgery, statins, and selective serotonin reuptake inhibitors (SSRIs) were uncommon or unknown fifty years ago. New payment, delivery, and insurance arrange-

ments were developed: prospective payment, resource-based relative value scales, preferred provider organizations, and so on.

The first baby boomers turn sixty-five in just five years, and the nation faces the issue of where trends in health spending and health technology are leading. The increased share of spending for health care comes from increased total national wealth. Not only has the U.S. standard of living risen since the end of World War II, but better health care is part of that better standard.

The health of the elderly has improved. Death rates, led by the drop in heart disease and stroke mortality, have declined, and there have been recent improvements in functioning. The age-adjusted percentage of the noninstitutionalized population age sixty-five and older reporting their health as “fair” or “poor” fell from 34.9 percent in 1982 to 26.4 percent in 2002.<sup>2</sup>

■ **Health spending and health.** One of the most difficult and most important ques-

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tions for health policy is the relationship of health to health care spending. Studies now suggest that medical care has played an important role in improving the health of the population, and recent technical advances are cost-effective at generally accepted values of an added year of life.<sup>3</sup>

Findings from the RAND project that modeled the effects of changes in health, functioning, and health care treatments on spending for the population age sixty-five and older provide a number of important insights into the health–health technology–health spending relationship. RAND researchers modeled effects on both Medicare and total spending for the age sixty-five plus but report only effects on total spending. The methods used are complex, but, in essence, they are based on the insight derived from the life

table: that a picture of the unknowable future can be estimated from a study of the transition probabilities from one year to the next in variables of interest. In the case of the life table, a prediction of the expected life span of a newborn today is based on the latest data on annual death rates by age.

In the case of the RAND project, annual transition rates from one functional state to another or from the absence to the presence of one or more of eight chronic conditions or to death are modeled using data from the Medicare Current Beneficiary Survey (MCBS). The models are then used to construct health “histories” of simulated individuals. Transition probabilities are altered to simulate health improvements from medical advances (for example, reduced probabilities of functional decline), and new sets of health histories are constructed. The new histories are summarized to produce estimates of longevity and health spending under the new assumptions.

Although microsimulation is an elegant approach, its results are built on educated guesses about future technological advances. The RAND project synthesized the results of

expert panels to predict future advances, which were then modeled to analyze the interactions among health, demographic, and technological changes and health spending.

A common finding of three of these papers is that future changes in the functional status among the future elderly will have little effect on spending, in contrast to the view that the current trend in improved functioning will moderate cost pressures.<sup>4</sup> An elderly population with better functional status would have,

on the one hand, lower annual costs, but on the other, more years to accumulate costs. And they would still face the high costs of the last year of life, and greater longevity would bring an increased likelihood of high long-term care costs.<sup>5</sup>

In fact, the greatest rate of increase in health spending recently has been among

those with no limitations in activities of daily living (ADLs). This could reflect increased spending to preserve and restore health.<sup>6</sup> The percentage of total health spending now accounted for by the elderly with no ADL limitations now almost equals the percentage accounted for by those with three or more limitations (Exhibit 1).

The paper by Dana Goldman and colleagues illustrates some principles about the relation between technologies and costs.<sup>7</sup> All of the technological advances add costs. Their costs overwhelm any savings from improved health. There is no relation between the annual per person treatment cost and the impact of the technology on total spending (Exhibit 2). A hypothetical anti-aging compound is the most costly intervention, and it has the greatest cost impact, even when, under the best assumption, it extends healthy, not unhealthy years of life. And its high cost comes not from a high cost per treatment but from the cost of treating everyone from age thirty-five on and from an elderly population that is 18 percent higher in 2030 than it would have been. This is the ultimate “treatment expansion effect”

**“The greatest rate of increase in health spending recently has been among those with no limitations in activities of daily living.”**

**EXHIBIT 1**  
**Percent Distribution Of Beneficiaries And Total Medical Spending, By Functional Status, Medicare Beneficiaries Age 65 And Older, 1992 And 2001**

Functional status	People (%)		Spending (%)	
	1992	2001	1992	2001
All	100.0	100.0	100.0	100.0
No limitations	52.0	56.2	24.8	31.4
IADL limitations only	13.6	13.6	12.1	12.8
1-2 ADL limitations	20.2	17.7	23.4	21.7
3-6 ADL limitations	14.1	12.5	39.7	34.2

**SOURCE:** Medicare Current Beneficiary Survey (MCBS) tables in the Data Warehouse on Trends in Health and Aging, www.cdc.gov/nchs/agingact.htm (27 July 2005).

**NOTES:** IADL is instrumental activity of daily living. ADL is activity of daily living.

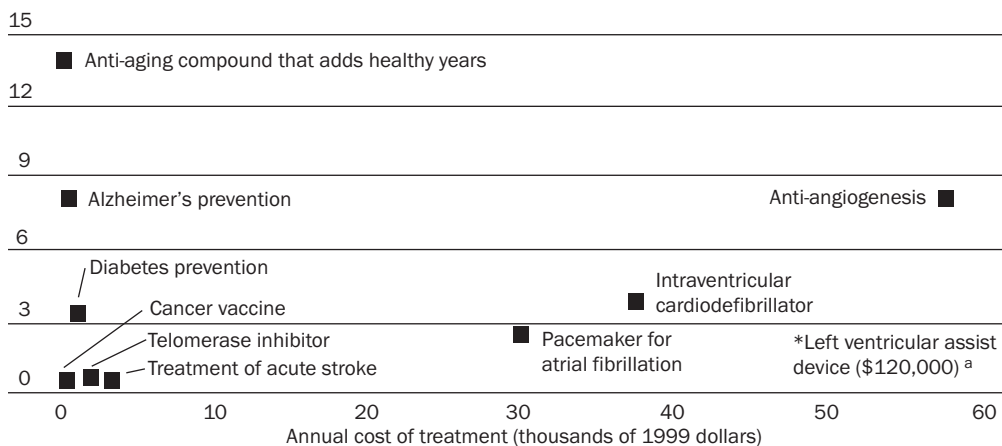
where a new technology is applied to everyone.<sup>8</sup>

One obvious reason that the new treatments increase Medicare costs for the elderly is that they are applied to the population age sixty-five and older. Improvements in the health of the pre-Medicare population that improve the health of older Americans might reduce the elderly's health spending. There is ev-

idence that good health profiles in middle age predict lower cumulative Medicare spending later. The effect even extends to spending in the last year of life—an intriguing finding that needs confirmation.<sup>9</sup> The findings of Martha Daviglius and colleagues are consistent with those of Geoffrey Joyce and colleagues, who estimate large differences in cumulative spending for those with and without chronic condi-

**EXHIBIT 2**  
**Estimated Annual Costs Of Treatment Per Patient And Projected Impact Measured By Percentage Increase In Total Spending For People Age 65 And Older For Selected Technologies In 2030**

Percent increase in spending over status quo



**SOURCE:** D.P. Goldman et al., "Consequences of Health Trends and Medical Innovation for the Future Elderly," *Health Affairs*, 26 September 2005, content.healthaffairs.org/cgi/content/abstract/hlthaff.w5.r5.

<sup>a</sup> Spending increase of 2.3 percent; treatment cost point (\$120,000) is well to the right of the end of this graphic.

tions at age sixty-five.<sup>10</sup> The RAND model also estimates modest cost savings from reductions in obesity and smoking in new cohorts of sixty-five-year-olds.<sup>11</sup> More findings from the RAND project on the cost effects of reducing risk factors for chronic diseases would help clarify whether reduction of chronic illnesses might moderate health spending for the elderly. If so, perhaps a “welcome to middle age” benefit for people turning fifty, similar to the new “welcome to Medicare” health assessment benefit, would make sense.

■ **Effect of technology.** In “The Health Care Quadrilemma,” Burton Weisbrod hypothesized an interaction between insurance coverage and the development of cost-increasing new technologies, an interaction that drove the increase in health spending.<sup>12</sup> Up until the implementation of Medicare prospective payment and the growth of managed care, Weisbrod believed that there was no incentive to develop cost-reducing technologies. At the time of his article’s publication (1991), Weisbrod believed that “the current climate and incentives facing the R&D [research and development] sector are not conducive to the development of costly new technologies,” and that “the new signal is as follows: Develop new technologies that reduce costs, provided that quality does not suffer ‘too much.’”

We cannot state how fast spending would have risen without prospective payment and other payment and delivery reforms, but it seems that the current climate is not as unfavorable to technology development as Weisbrod had thought it would be. The percentage of Medicare beneficiaries in health maintenance organizations (HMOs) has fallen since 2000. Traditional Medicare has little control over the number of treatments—witness the growth in coronary angioplasties and joint replacements. The Medicare national coverage decision (NCD) process continually integrates medical advances into Medicare and now intends to combine coverage with data gathering to monitor effectiveness—“coverage with evidence development.”<sup>13</sup>

Because Medicare is still open ended—fee-for-service at the beneficiary level and no firm

budget at the national level—it is not surprising that spending and technology continue to grow. Beneficiaries have no financial incentive to choose less expensive treatments: The only benefit for Medicare beneficiaries is medical care; about 90 percent have other insurance to cover Medicare’s cost sharing.

The RAND project demonstrates that neither new health-enhancing technologies nor improved functional status at age sixty-five is likely to relieve the budget pressure on Medicare. Even though recent technical advances are cost-effective at generally accepted values of an added year of life, we must ask how much society will want to pay in the future for these benefits.<sup>14</sup> Cost-effectiveness has no necessary relation to affordability at the societal level. A deeper understanding of biology might lead to preventive and curative approaches that actually lower costs, but it seems unwise to rely on that possibility to solve the budget crisis of the next few decades.<sup>15</sup>

**I**N THE WORDS OF Eugene Steuerle, “The legacy we are about to leave our children is a government whose almost sole purpose is to finance our own consumption in retirement.”<sup>16</sup> Policies suggested to address the crisis include incentives to promote greater labor-force participation by older people (to increase national output, tax revenues, and savings), to promote good health habits, and to deal with the open-ended structure of Medicare, including incentives for cost efficiency at the global, not just at the disease or treatment, level.<sup>17</sup> These changes could involve a change in expectations about Medicare, but the readjustment should be eased by the knowledge of the benefits in better health and longer life that the program has provided.

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## NOTES

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