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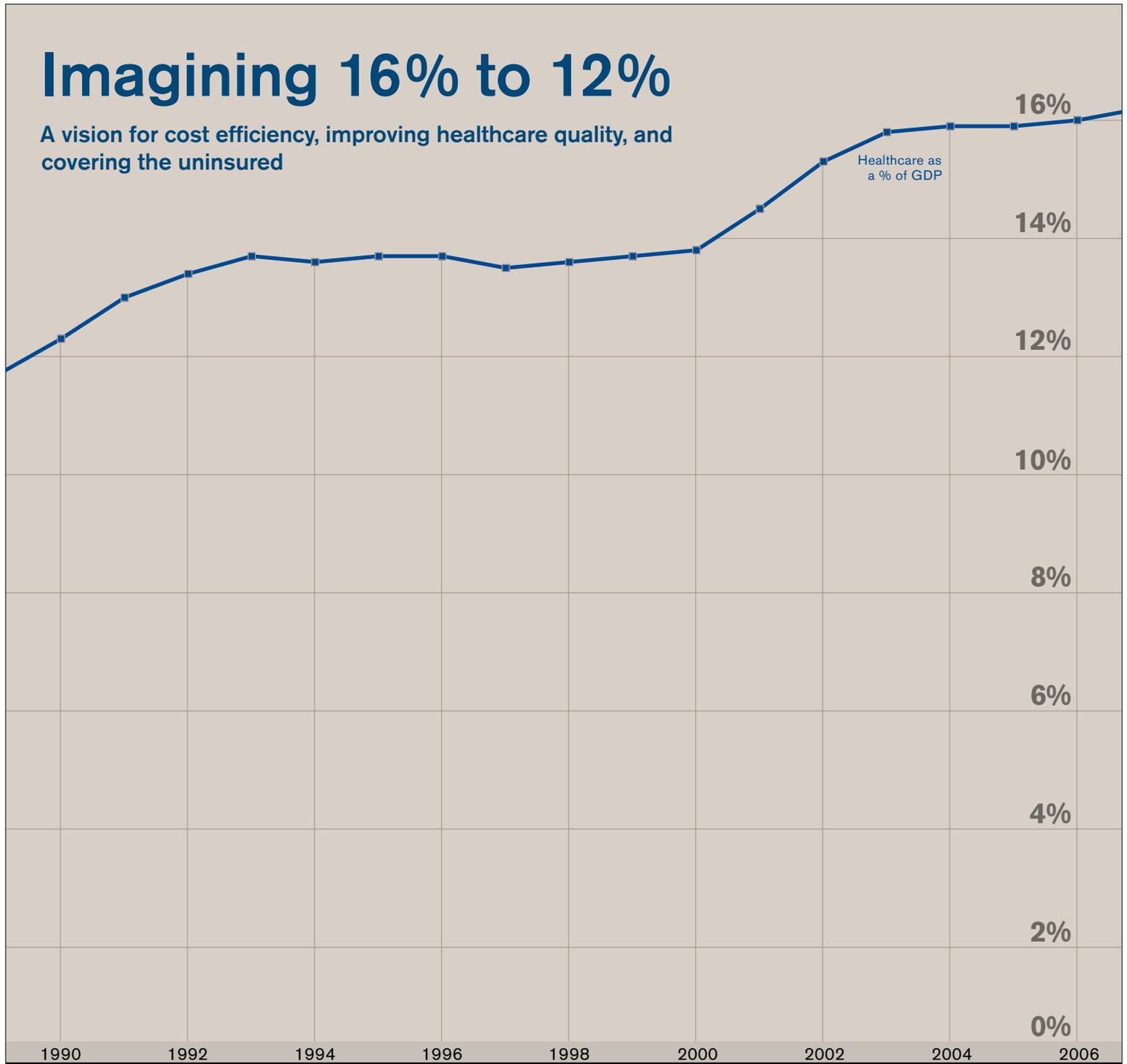
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# Imagining 16% to 12%

A vision for cost efficiency, improving healthcare quality, and covering the uninsured





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Cover image: National Health Expenditure as a percentage of GDP.

Source: Centers for Medicare & Medicaid Services.

National health expenditures by type of service and source of funds: calendar years 2007–1960.

Available at: [http://www.cms.hhs.gov/NationalHealthExpendData/02\\_NationalHealthAccountsHistorical.asp](http://www.cms.hhs.gov/NationalHealthExpendData/02_NationalHealthAccountsHistorical.asp)

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## INTRODUCTION: TRYING TO IMAGINE THE POSSIBLE

**If the United States reduced healthcare spending to only 12% of gross domestic product (GDP) instead of our current 16%, we would still spend FAR more than any other country. The 4% saved is less than many estimates of healthcare waste and is more than the annual expenditures on motor vehicles.**

If the United States reduced healthcare spending to only 12% of gross domestic product (GDP) instead of our current 16%,<sup>1</sup> we would still spend *far* more than any other country. The 4% saved is less than many estimates of healthcare waste and is more than the annual expenditures on motor vehicles.

This paper presents projections of achievable healthcare cost savings. These savings could pay for health insurance for everyone in the United States and still reduce total healthcare spending from 16% to 12% of GDP. Furthermore, these savings could be achieved while also improving the quality of care. The projections presented in this paper are based on actuarial modeling and are grounded in observed best practices in healthcare management. Certainly other scenarios for reducing healthcare spending are possible; our theme is that the right care is better care and is less expensive. Our purpose in writing this paper is to stimulate debate about how we will achieve these significant savings.

Although economic stimulus programs will likely increase healthcare spending in the near term, especially by federal and state governments, the authors demonstrate here the longer-term potential to redirect or even reduce spending associated with unexplained and ineffective variation in healthcare utilization, the value of which is rightfully under scrutiny. Of course, a drastic change in spending will not happen quickly, but it could reverse the current pattern of waste while making available huge resources for other uses in business, creating jobs, boosting personal consumption, and allowing more government spending for important initiatives. In this paper, the authors assemble evidence to support our contention that significant reduction in wasteful healthcare utilization is possible, while at the same time improving both healthcare quality and access.

We believe that a bold vision of effective and efficient healthcare delivery can help overcome obstacles to healthcare reform. This paper presents that vision in financial and actuarial terms. The debate over single-payer, private-coverage, or public plans remains essential, of course, but is not part of our review. Likewise, we don't address who pays, but rather examine the specifics of how payment could be affected. We offer a vision of what's possible as an antidote to the preoccupation with political roadblocks.

Many reform proposals already include well-reasoned ideas for fixing the system.<sup>2</sup> Thousands of efforts to improve efficiency and quality are underway, including programs sponsored by Medicare, Medicaid, commercial insurers, hospitals, and physicians. To those efforts we add an aggressive vision of how far we can go. We explore what a more efficient American healthcare system might look like: the better outcomes, and the potential winners and losers, in our medical-industrial complex. This information applies to virtually all proposed healthcare financing reforms, ranging from single-payer to incremental approaches.

### Our challenge and why it's possible

Our goal goes beyond reducing healthcare spending from 16% of GDP to 12%. The intent of our vision also includes:

- Covering the uninsured
- Improving quality
- Fixing core deficiencies and increasing resources for primary care<sup>3</sup>

**Transforming healthcare to reduce spending by 25% is dramatic, but we note prominent estimates that up to 50% of U.S. healthcare spending could be classified as waste.**

We see signs that agreement on healthcare reform—and, in particular, on the need to reduce waste and inefficiencies in healthcare—is closer than ever. Transforming healthcare to reduce spending by 25% is dramatic, but we note prominent estimates that up to 50%<sup>4 5</sup> of U.S. healthcare spending could be classified as waste. We note also the call by one prominent insurance trade group to reduce spending by 30%.<sup>6</sup> Senator Max Baucus, a leading proponent of reform, identifies “an absolute commitment to weed out waste” as critical to achieving a high-performing healthcare system.<sup>7</sup> Even before the 2008 general election, a broad consensus had emerged on needed changes in the healthcare system in addition to reducing costs: covering the uninsured, relying more on evidence-based medicine, using comparative effectiveness evaluations of new and existing treatments to determine which are most cost-effective,

## ACTUARIAL INSIGHTS FOR HEALTHCARE REFORMERS

This report's information is intended to help healthcare reformers of all stripes develop better proposals. In particular:

- The material applies to all kinds of reforms, from single-payer to privatization.
- We acknowledge the widespread concern over the current high spending on healthcare (about 16% of GDP) and show the potential to reach lower spending (12% of GDP); however, the material and models would also work for those who want to obtain more value at current spending.
- State-level reformers can apply the concepts in this paper, and the models could be customized for individual states.

setting quality standards and metrics, creating accountability for outcomes, encouraging informed patient choice, promoting electronic medical records, and more.

Our sense of waste or inefficiency is informed by what we believe is possible according to the expertise and healthcare cost analytics we have developed. Much spending in our healthcare system goes to services or administration that could be done more efficiently or that do not bring value to patients. Even worse, some spending also goes to services that may harm the patient, or to fix mistakes that should not have been made. Fortunately, the huge magnitude of waste is illuminated by comparing national averages to the bright spots of healthcare excellence.

To some, the 12% goal may at first be taken as a budget or an attempt to ration healthcare. The advantages and disadvantages of an enforceable national budget for healthcare spending are discussed in the Congressional Budget Office's recent health insurance reform report.<sup>9</sup> We consider 12% a target for what is possible, not a budget. We believe rationalizing care is far superior to rationing it.

The authors hope this material helps the nation reconsider what some experts might dismiss as impossible. Economic forecasts require assumptions and cannot capture all factors, and this limitation applies to this work. This paper reflects the research of the authors and should not be interpreted as expressing the endorsement of Milliman, Inc., for any particular proposals or policies.

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## THINKING BOLDLY ABOUT HEALTHCARE REFORM

The United States spends far more on healthcare than any other country, and by some prominent measures our health outcomes are among the worst of advanced nations.<sup>9</sup> In 2006, we spent approximately 16% of GDP on healthcare—about \$2.1 trillion dollars out of our total GDP of \$13.1 trillion, or more than \$7,000 per capita.<sup>10</sup> The next closest nation, Switzerland, spent only 11% of GDP, or approximately \$4,300 per capita. While precise international comparisons are difficult and vary with exchange rates and other factors, the high cost of healthcare in the United States is swelling government deficits (federal, state, and local), hurting competition with foreign companies, pushing people into the ranks of the uninsured, depressing wages, and diverting dollars from other needs.<sup>11</sup> Reducing U.S. healthcare spending by 25%—from 16% of GDP to 12%—would be less of a reduction than many prominent estimates of healthcare waste.<sup>12 13</sup> At 12%, we would still spend far more than any other country (down to \$5,300 per capita). Writing in 2009, the authors are not suggesting to further shrink the GDP. Rather, healthcare payers (governments, employers, and individuals) could reallocate more than half a trillion dollars realized each year from reduced healthcare spending, using the money for increased wages, infrastructure investments, etc. Alternatively, the savings could go to deficit reduction, reduced taxes and prices, or funding Medicare. Politics aside, we believe the 12% figure—or even lower—is possible. The purpose of our report is to lend credible, quantitative support for this bold notion and move the debate into the realm of how to get there.

**Writing in 2009, the authors are not suggesting to further shrink the GDP. Rather, healthcare payers (governments, employers, and individuals) could reallocate more than half a trillion dollars realized each year from reduced healthcare spending, using the money for increased wages, infrastructure investments, etc.**

Because the U.S. does not have a single-payer system, most analyses consider the sources of spending, which is sometimes called market segment. Figure 1 contains a summary of 2008 spending, which includes both insured and out-of-pocket spending.

**FIGURE 1: WHERE THE MONEY IS IN U.S. HEALTHCARE: 2008 EXPENDITURES**

MARKET SEGMENT	POPULATION (MILLIONS)	COST IN \$ BILLIONS BEFORE PAYER ADMINISTRATIVE COST
LARGE GROUP	132	\$502
SMALL GROUP	29	\$143
INDIVIDUAL	18	\$72
<b>SUBTOTAL: COMMERCIAL</b>	<b>179</b>	<b>\$717</b>
MEDICAID	44 <sup>i</sup>	\$334
MEDICARE	44	\$567
<b>OTHER COVERED POPULATIONS<sup>i</sup></b>	<b>12</b>	<b>\$144</b>
UNINSURED	41-77 <sup>iii</sup>	\$86
OTHER <sup>iv</sup>		\$374
<b>ADMINISTRATIVE COSTS,<sup>v</sup> ACROSS ALL MARKET SEGMENTS</b>		<b>\$166</b>
<b>TOTAL</b>	<b>304<sup>vi</sup></b>	<b>\$2,388</b>

Source: Milliman Healthcare Reform Model

- i Estimate based on average enrolled at a point-in-time rather than the number of persons enrolled at any point during the year.
- ii Other covered populations include the Department of Defense, Veterans Affairs, workers' compensation, maternal health, etc.
- iii Population of the full-year uninsured is 41 million and of partial-year is 77 million; costs reflect those of the uninsured at any point in the year.
- iv This service category includes other out-of-pocket spending and ancillary benefits, including private long-term care, home health, dental, vision, and over-the-counter drugs, as well as other government spending and private investment.
- v Administrative costs include insurer profits.
- vi Total population is not the sum of the column because some people fall into more than one category.

Applying demonstrated U.S. high-performance utilization metrics to the healthcare system's current spending will get us far below 12%—as would removal of other's figures for estimated waste. For this report, we applied a level of best-performance utilization metrics to reach 12% of GDP—*after we added spending to cover the uninsured*. Figure 2 presents these results by major health-related services categories. We also show the total potential for reduction that emerges from our models when all utilization is moved to best observed practice. See the methodology section for a description of the categories.

**For this report, we applied a level of best-performance utilization metrics to reach 12% of GDP—after we added spending to cover the uninsured.**

**FIGURE 2: OPPORTUNITIES FROM REDUCTION IN WASTE**

**POTENTIAL COST REDUCTION GRID BY SERVICE CATEGORY  
(REFLECTS ALL MARKET SEGMENTS INCLUDING THE UNINSURED)  
(ANNUAL COSTS IN \$ BILLIONS)**

SERVICE CATEGORY <sup>i</sup>	2008 ESTIMATE	MODEL AT 12% OF GDP	% CHANGE TO REACH 12%	POTENTIAL FOR REDUCTION
<b>INPATIENT SERVICES</b>	\$500	\$311	-38%	-43%
<b>SKILLED NURSING FACILITY</b>	\$49	\$45	-8%	-9%
<b>HOME HEALTH SERVICES</b>	\$64	\$62	-3%	-3%
<b>OUTPATIENT FACILITY SERVICES</b>	\$257	\$166	-35%	-40%
<b>PROFESSIONAL, INPATIENT SURGERY</b>	\$55	\$42	-23%	-26%
<b>PROFESSIONAL, OUTPATIENT SURGERY</b>	\$88	\$68	-23%	-26%
<b>INPATIENT VISITS</b>	\$27	\$15	-42%	-47%
<b>OFFICE VISITS / MISC.</b>	\$157	\$134	-15%	-17%
<b>OTHER PROFESSIONAL</b>	\$225	\$146	-35%	-40%
<b>OTHER MEDICAL</b>	\$54	\$27	-51%	-57%
<b>PRESCRIPTION DRUGS</b>	\$249	\$186	-25%	-28%
<b>DENTAL</b>	\$102	\$92	-10%	-11%
<b>NURSING HOME, OTHER LONG-TERM CARE</b>	\$218	\$192	-12%	-14%
<b>VISION</b>	\$22	\$18	-19%	-22%
<b>OVER-THE-COUNTER DRUGS</b>	\$22	\$22	0%	0%
<b>ADMINISTRATION</b>	\$166	\$131	-21%	-23%
<b>OTHER (RESEARCH, ETC.)</b>	\$135	\$135	0%	0%
<b>TOTAL</b>	<b>\$2,388</b>	<b>\$1,791</b>	<b>-25%</b>	<b>-28%</b>

Sources: Milliman Healthcare Reform Model, Milliman Medical Index 2008, Milliman's Health Cost Guidelines 2008

i Service categories are described in more detail in the methodology section.

The assumptions and models we used to project potential savings are based on observed, composite results of health benefits programs. While the shifts in utilization and spending are from actuarial models in Milliman's Health Cost Guidelines™, the results are broadly consistent with numerous published studies<sup>14</sup> and observed variation in aggregate utilization by HMOs and insurers. Certainly, there are other ways to reach the bottom line goals we set: cutting unit reimbursement, better management of chronic disease, better preventive care, etc. These other approaches could produce different distributions of spending than those presented here.

This report presents national average figures. Healthcare spending in some locales is already very efficient and there is probably little room for improvement. In other places, the potential reductions in spending are greater than those shown above.

The changes in spending shown above reflect shifts in utilization, not unit reimbursement. We assume the unit amount for an office visit or a CAT scan, for example, will not change. In particular, we kept Medicare hospital reimbursement at the current case rates. We also held constant total spending on public health and medical research, which currently amounts to more than \$100 billion annually. What changes in our model is the utilization—for example, reductions in unnecessary inpatient stays or inappropriate imaging. The site of service also changes to emphasize lower cost settings—for example, home care instead of nursing-home care, or office-based primary care instead of emergency room care.

Of course, there are enormous practical challenges in achieving a 25% reduction in healthcare cost and at the same time improving quality. But strong evidence to support the feasibility of significant cost reductions while improving healthcare quality includes:

- The fact that many other countries spend much less and get similar or better outcomes
- Studies that report more care and resources do not result in better quality and show that more care may in fact be worse
- Many studies that show the amount of waste is greater than 25% of spending
- Analyses showing that a large portion of healthcare spending is for conditions that are preventable or avoidable
- Milliman actuarial models showing large variation in outcomes and cost depending on healthcare delivery efficiency

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**This report uses actuarial models to create a vision of how spending for particular healthcare services will change in going from 16% to 12% of GDP.**

This report uses actuarial models to create a vision of how spending for particular healthcare services will change in going from 16% to 12%. The target for reduced spending is formed by adjusting the national average utilization for services to reach the significantly lower utilization in best-performance systems.

As noted earlier, we did not reduce some categories of spending, and other experts may well identify opportunities in these categories. For example, we kept constant the spending on public health, medical research, and infrastructure, which amounts to more than \$100 billion annually. Similarly, we did not reduce the \$22 billion for over-the-counter drugs. Payer administrative costs decrease, but only because we kept them as a constant percent of healthcare spending in relevant market segments. We did not reduce the billions that individuals spend out-of-pocket for cosmetic surgery. Certainly the billions spent on unproven, ineffective, or harmful alternative therapies (e.g., weight-loss products sold through infomercials, total body scans, or health-food remedies) could be considered waste and a consumer/public health hazard that can lead to higher healthcare costs covered by insurance programs.

Experts in healthcare management know thousands of ways to improve the system. These range from the simple, such as healthcare workers washing their hands to avoid spreading infections, to the high-tech, such as genomic testing so a patient will get the biotechnology drug most likely to work against his or her specific cancer. Allowing these techniques to flourish is, perhaps, the real goal of healthcare reform. Many advocates of reform point to how changing our current reimbursement systems can promote greater efficiency by changing providers' financial incentive from providing more care into providing better care.<sup>15</sup>

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**Of course, reducing inefficient and medically unnecessary utilization will result in some winners and some losers. Whether an organization finds itself a winner will depend on its ability to adapt to an efficiency- and quality-driven healthcare delivery model.**

Of course, reducing inefficient and medically unnecessary utilization will result in some winners and some losers. Whether an organization finds itself a winner will depend on its ability to adapt to an efficiency- and quality-driven healthcare delivery model. Over its history, the United States has seen industries grow and shrink even as the nation continued to prosper: the family farm, the auto industry, shipbuilding, and investment banking, to name a few. We have taken the optimistic view in this report that all of us will be better off and healthier when the healthcare system is more efficient.

#### **Covering the uninsured**

Our 12% model includes the cost of covering people who are currently uninsured or partly uninsured. Prominent estimates put the number of uninsured lives at about 41 million for the entire year to 77 million for at least part of 2008.<sup>16</sup> The uninsured do account for some spending, which may be from

out-of-pocket sources or charity care. We used estimates for the additional spending required to provide comprehensive coverage to the uninsured, and adjusted the total spending (current and additional) using our efficiency assumptions.

Kaiser Family Foundation has estimated that \$86 billion is currently spent on the uninsured, which includes out-of-pocket and government dollars spent on uncompensated care, and it estimates an extra \$123 billion is needed for full coverage.<sup>17 18</sup> We note that the Kaiser Family Foundation figures do not include reform process costs, such as changes to administrative systems to ensure enrollment. We applied our efficiency factors to the uninsured to reflect more efficient care delivery. The costs for the uninsured, like our other costs, do not address who pays, but do assume administrative costs and management opportunities.

## WHAT THE NEW SYSTEM WILL LOOK LIKE

Traditionally, the healthcare system is divided into three categories:

- Physicians and other healthcare professionals
- Hospitals
- Prescription drugs

While divisions among these categories are, in part, a symptom or cause of inefficiency, we use the categories to identify how the system can change. However, we begin with the most important element of the system—patients—and how the patient experience will change in the new system. We end the section by suggesting the new system will transform the “all healthcare is local” paradigm.

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### Healthcare reform is, of course, primarily about patients.

#### The patient experience

Healthcare reform is, of course, primarily about patients. Patients in our 12% system will definitely notice the difference:

- The patient will consistently receive attention and interventions according to treatment plans based on sources of evidence-based medicine, openly communicated.
- The patient's communications and interactions with the healthcare system will be through streamlined administrative systems, along with expanded hours and e-mail and phone access to clinical advice and healthcare educational resources.
- By receiving comprehensive and credible cost and quality information, the patient will be able to make more informed provider choices, even if consolidation or affiliations of healthcare providers mean the patient may appear to have fewer choices of distinct providers.
- Healthcare workers (including physicians) will change behaviors and processes to focus on patient safety (avoiding errors of commission or omission) and the delivery of efficacious and efficient care delivery.
- A team approach to healthcare, with clinical health information shared and used by multiple caregivers in a particular setting and, eventually, across the spectrum of care, will result in fewer medical errors, shorter hospital stays, and better outcomes.

Most or all of these characteristics appear in many healthcare reform proposals.<sup>19 20</sup>

#### The healthcare professional experience

We believe physicians and other healthcare professionals will work differently in the new system. For example, they will:

- Obtain bureaucracy relief thanks to simplified and standardized paperwork plus electronic communication for, at the very least, prescriptions
- Shift from practice based on professional norms to evidence-based practice
- Collaborate with primary care physicians who will have an expanded scope of practice
- Receive additional compensation for services not currently reimbursed, such as telephone calls, e-mail exchanges, care coordination, and disease-management services,<sup>21 22</sup> and receive performance-based reimbursement that supports appropriate care, but in which negative performance would encompass both gaps in care and inappropriate care<sup>23 24</sup>
- Face barriers or other scrutiny for preference-sensitive and supply-sensitive care delivery, which are often areas of overutilization<sup>25 26</sup>

- Connect and communicate with all treatment providers and operate in an organized system of care
- Make greater use of physician extenders

The new system will likely increase the prominence of primary care. More primary care physicians per capita, and increases in that ratio, have repeatedly been associated with better health outcomes, mortality, and decreased hospital admissions.<sup>27</sup> However, there is significant U.S. regional variation in the percentage of physicians who are primary care physicians, ranging from 33% to 47%.<sup>28</sup>

### Reengineered hospital care

Dramatic variations in inpatient utilization point to a significant opportunity to reduce inpatient admissions and improve the through-put of medically necessary admissions. John Wennberg, the founder of the Dartmouth Atlas and pioneer of small-area variation studies, notes potential reductions in Medicare inpatient spending of 28% under a Mayo Clinic model-care delivery system and of 43% under an Intermountain Health model-care delivery system.<sup>29</sup> Milliman's *Hospital Efficiency Index*<sup>TM</sup>, which identifies highly efficient practices through a risk-stratified analysis of hospital data, supports this conclusion.<sup>30</sup> Publicly available statistics from health plans also confirm wide variation in admissions and thus treatment and spending.<sup>31</sup> Wennberg correlates supply with increased utilization (supply-sensitive care) and reports increased utilization in regions with a higher per-capita supply of hospital beds and physicians.<sup>32</sup>

Regional variation is particularly evident when comparing utilization per capita for preference-sensitive care. Preference-sensitive discretionary surgeries such as joint replacement and back surgery have dramatic regional variation rates per capita. For example, Dartmouth Atlas of Health Care reports up to a twentyfold variation in lumbar fusion procedures across the United States.<sup>33</sup>

We believe the reengineered hospital system will have the following characteristics:

- Hospitals would operate on a 12/7 (12 hours a day, 7 days a week) or 24/7 basis. By contrast, many hospitals currently do not provide diagnostic and treatment services on weekends or after normal business hours; this delays the progression of care and has negative quality and cost implications.
- The focus of hospitals will be on the urgency of in-hospital treatment with hospitalists in clear control of medical patients, and appropriate and timely specialty consultations provided.
- Evidence-based clinical pathways and physician decision-support-order sets will guide care and allow for performance monitoring.
- Physicians working in hospitals will use computerized physician-order-entry applications for medications, diagnostic tests, ancillary services, and electronic reporting of diagnostic results.
- Hospitals will implement effective emergency room processes to avoid medically unnecessary admissions, and discharge to appropriate levels of care.
- Patients will benefit from effective discharge planning and appropriate follow-up care. One prominent report estimates that 18% of Medicare hospitalizations result in readmission within 30 days, and the majority of these readmissions are potentially avoidable.<sup>34</sup>
- Staff will inform, educate, and engage the patient and family throughout the hospital stay.
- Hospitals will coordinate with medicalized nursing-home and home care to reduce potentially avoidable admissions to acute-care hospitals.

### Prescription drugs

Prescription-drug use is subject to more intense scrutiny than other health services, partly because each drug has its own code and drug use is easily tracked through computer systems. We believe there is significant opportunity for improved efficiency. The reduction in drug cost in our 12% model comes largely through increased shifts to generics and tighter formulary management.

**The new system will likely increase the prominence of primary care. More primary care physicians per capita, and increases in that ratio, have repeatedly been associated with better health outcomes, mortality, and decreased hospital admissions.**

The economics behind prescription-drug costs are complex, with the food chain including research, clinical trials, patent law, Food and Drug Administration (FDA) approvals, marketing and various intermediaries such as prescription benefit managers (PBMs). The entire process is rarely considered holistically.<sup>35</sup> While not necessary for our 12% model, future efficiency improvements would probably include some of the following elements:

- Expedited FDA approvals that might include appropriate use of non-traditional effectiveness and safety measures such as biochemical markers and outcomes surveillance with insurer data
- Greater financial transparency and commoditization of manufacturer-to-distributor-to-consumer processes
- Alignment of interests between drug companies, providers, payers, and patients to improve drug therapy adherence and persistence
- Evidence-based prescribing combined with personalized medicine that can identify optimal treatments for individuals; this will likely reduce spending on inappropriate medications, trial-and-error prescribing, and marketing
- Extending prescribing rights to nurse practitioners, as is allowed in several states<sup>36</sup>

Technological innovations in healthcare are often associated with pharmaceuticals; our expectation is that, as in other industries, innovators will be rewarded for helping reduce costs.

#### **Will healthcare reform end the “all healthcare is local”<sup>37</sup> paradigm?**

The saying “all healthcare is local” is manifest in everything from local variations in physician practices to local health issues associated with socioeconomic and environment to hospital payment rates. However, local variation is synonymous with inefficiency and waste,<sup>38</sup> and few excuses for inefficiency and poor quality are more frustrating than the localism of “that’s how we do it here.” Certainly, the promulgation of benchmarks for healthcare quality and efficiency, along with evidence-based medicine, reflect a movement away from “all healthcare is local.” In this section we give examples of how innovators are challenging the “all healthcare is local” paradigm to bring lower costs.

Wal-Mart’s program of \$4 generics<sup>39</sup> illustrates that companies skillfully commoditizing healthcare products can put competitive pressure on others that heavily mark up the same products. Over-the-counter prices for some durable medical equipment (DME) items are significantly lower than Medicare’s regulated prices,<sup>40</sup> and that has demonstrated opportunities for Medicare to reduce costs.<sup>41</sup> Overseas radiology outsourcing, where an image is sent electronically to another country for interpretation, has become routine.<sup>42</sup> Drug re-importation and other dynamics prove that locally delivered healthcare can have international content.

While drugs, DME, and image-interpretation outsourcing may be considered the fringes of healthcare, medical tourism—which involves low-cost treatment at overseas hospitals—is closer to the core. Often the cost of transportation plus treatment is a fraction of U.S. costs.<sup>43</sup> An estimated 750,000 Americans traveled abroad for healthcare in 2007.<sup>44</sup> Two dynamics suggest the influence of medical tourism may be set to increase dramatically:

- Many of the largest insurers are offering medical tourism programs.
- Accreditation and quality-control organizations are actively involved.

As many other industries have learned, international competition at the margins can create pressure to reduce cost.

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**As many other industries have learned, international competition for healthcare services can create pressure to reduce costs.**

## SOME CONSIDERATIONS NOT IN OUR REDUCED-COST MODEL

In this section we consider some of the prominent issues in healthcare reform that could lead to savings beyond those in our models.

### Better end-of-life care

End-of-life care is an important healthcare quality and economic issue. About 32% of total Medicare dollars are spent on patients with chronic illness in their last two years of life.<sup>45</sup> End-of-life medical-care utilization varies dramatically by locale and by the hospital associated with a patient's physicians. Wennberg compares utilization patterns at 93 academic medical centers for individuals with nine chronic diseases (including cancer) during the last six months of life. Use of intensive-care-unit (ICU) and critical-care-unit (CCU) bed-days per person varied from 1.4 to 7.5 days. Medical-specialist visits varied from 6.2 to 55.8 visits per person. Hospice utilization (measured as days enrolled in hospice per person) varied by a factor of 19, and higher use was associated with lower inpatient day utilization and lower inpatient costs.<sup>46</sup> Recent evidence suggests that hospice care prolongs life.<sup>47</sup>

**End-of-life care is an important healthcare quality and economic issue. About 32% of total Medicare dollars are spent on patients with chronic illness in their last two years of life.**

We believe it is time to use the best care concepts of evidence-based medicine for end-of-life care, including:

- Development of best-practice criteria to guide end-of-life care delivery and to set patient expectations
- Continued promotion of palliative care-at-home concepts as an alternative to hospitalization or institutionalization
- Streamlined approaches that ensure compliance with patient and family wishes such as advanced directives
- Inclusion of hospice care as a control arm in clinical trials performed on patients with terminal illness<sup>48 49</sup>
- Comparative effectiveness standards for evaluating end-stage or end-of-life treatments, e.g., third-line chemotherapy, ICU treatment

Inevitably, the topic of spending on end-of-life care leads to discussion of societal choices—for example, spending on prolonging life versus covering the uninsured. Our approach and the assumptions in our models are about providing best care, not rationing care. We have not explicitly considered end-of-life care in our financial models, although we believe the more efficient systems and regions already have better end-of-life practices, and some of such savings are already counted in our 12% model.

### Medical malpractice

The direct cost of medical malpractice is about \$25 billion annually, an estimate of the premiums paid to medical-malpractice insurers and funding for self-insurance programs.<sup>50</sup> This is about 1% of medical spending. If this direct cost were to be cut in half, the 16% GDP would decrease by 0.1% points—not a huge help in our path to 12%. We have not separately considered direct medical-malpractice costs, nor the costs of defensive medicine, although one estimate places the latter at a significant 9% of total medical spending.<sup>51</sup> Some of such savings are likely already counted in our 12% model.

### Administrative cost

Our models itemize administrative costs for payers that, in aggregate, come to about 6.9% of total healthcare costs or nearly \$170 billion in 2008. Providers also have administrative expenses not included in that figure. One source estimates the waste in operations (both provider and payer) in the range of \$126 billion to \$315 billion. This waste consists of inefficiencies in claims processing, ineffective use of IT, avoidable staffing turnover, and paper prescriptions.<sup>52</sup>

In this paper, we assumed that administrative costs remain approximately constant as a percent of the total reduced healthcare costs that flow through insurance programs. We believe additional

administrative savings are possible. Reductions in payer administrative costs have been suggested as a component of healthcare reform and are widely acknowledged as feasible.<sup>53</sup> For example, Medicare has lower administrative fees than typical private payers, although the extent of the difference is contested.<sup>54</sup>

As another example, some healthcare reform proposals could displace the current broker-based distribution system. According to 2007 data from the Bureau of Labor Statistics, about \$2.5 billion in annual salary expense is associated with Insurance and Employee Benefits Funds.<sup>55</sup> Using a 2.0 multiplier to develop a total expense estimate of \$5.0 billion (salaries plus overhead) makes this expense about 0.2% of total healthcare spending. We have not considered any of these areas explicitly, other than to note they are opportunities for further cost reduction.

### What about the aging population?

The U.S. population may be aging—but very slowly. Our population is definitely growing—the birth rate in 2007 was 175% that of the death rate.<sup>56</sup> Immigration adds millions each year, accounting for nearly 40% of the U.S. population change from 2000–2007,<sup>57</sup> and many immigrants are younger. Some projections predict the U.S. population will age slowly, but aging is not the dominant force behind healthcare inflation or high U.S. costs.<sup>58,59</sup> In general, older people have higher medical costs, so the portion of older people in a country does have an impact on healthcare costs. However, the United States does not rank in the top 20 Organisation for Economic Co-operation and Development (OECD) countries in the portion of population 65 years and older compared to working-age people (Figure 3).<sup>60</sup> In short, it's difficult to blame our aging population for our high medical costs. If we don't fix the healthcare system, when the Baby Boomers retire it will be the high cost of medical care provided through Medicare, not aging, that will burden the future generation.

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We can do a better job of caring for the elderly. Long-term care (LTC), including nursing-home and home health, is a major burden, at \$282 billion or 12% of healthcare spending, most of which is funded by Medicaid. The opportunity for improvement can be realized by diverting or delaying institutional-based LTC (typically now in a nursing home) and substituting enhanced community-based LTC (in a home or assisted-living facility). Of Medicaid benefits for LTC, 56% of the people and 77% of the dollars are spent in nursing homes. States vary enormously in how they spend for LTC. Oregon, a leader in reducing nursing-home use, spends 55% of its LTC dollars on home services, while Tennessee spends only 1% of its LTC dollars on home services.<sup>61</sup>

The authors of a recent AARP Public Policy Institute report summarize the potential: “On average, Medicaid dollars can support nearly three older people and adults with physical disabilities in home and community-based services (HCBS) for every person in a nursing home. Thus, to the extent that states provide HCBS instead of nursing-home services, this shift in service delivery can be both cost-effective and responsive to the preferences of people with disabilities.”<sup>62</sup> Our model has the majority of LTC recipients receiving care in a home or home-like setting.

**FIGURE 3: WORLD HEALTH ORGANIZATION RANKINGS ON POPULATION AGING**

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) COUNTRY	OLD AGE DEPENDENCY RATIO
ITALY	29.8%
JAPAN	29.8%
GERMANY	28.1%
GREECE	27.1%
SWEDEN	26.4%
BELGIUM	26.3%
PORTUGAL	25.0%
FRANCE	25.0%
SPAIN	24.5%
UNITED KINGDOM	24.4%
FINLAND	23.9%
AUSTRIA	23.8%
DENMARK	22.9%
SWITZERLAND	22.7%
NORWAY	22.3%
HUNGARY	22.0%
LUXEMBOURG	21.1%
NETHERLANDS	21.0%
CZECH REPUBLIC	19.9%
AUSTRALIA	19.5%
CANADA	19.0%
POLAND	18.8%
UNITED STATES OF AMERICA	18.3%
NEW ZEALAND	18.3%
ICELAND	17.7%
SLOVAKIA	16.4%
IRELAND	16.3%
REPUBLIC OF KOREA	13.1%
MEXICO	9.2%
TURKEY	8.5%

Source: United Nations Population Division. The United Nations World Population Prospects: The 2006 Revision

### Wellness/prevention, disease management, and medical home

Variations on wellness, prevention, disease management, and medical home models factor prominently in many healthcare reform proposals. Improved exercise, diet, and other health behavior changes could dramatically shrink costs by reducing diabetes, cancer, hypertension, and heart disease, among other conditions.<sup>63</sup> Our cost-reducing models do not count on dramatic behavior changes, although we believe efforts to create a healthier population will be an important part of reform.

We have not explicitly included either the costs or benefits of wellness, disease management, and medical home programs in our model. Although there has been much enthusiasm about disease management, under current delivery models (telephonic outreach by nurses in call centers) medical-cost savings and clinical improvements have not been credibly reported.<sup>64 65 66</sup> The early results for the medical home model appear very promising, and it holds hope for dramatic improvements in outcomes as chronic-care management and coordination improve.<sup>67 68</sup> The verdict is not yet in on the cost and quality impact of wellness initiatives. Although there has been a dramatic increase in uptake of these programs in recent years by employer groups, the overall effect takes several years to achieve even if individuals actually change their health-risk behaviors and maintain that change long term. Steady gains in compliance with prevention and screening practices are commonly reported, but few cost-benefit analyses have been

**Our cost-reducing models do not count on dramatic behavior changes, although we believe efforts to create a healthier population will be an important part of reform.**

**There has been much enthusiasm about disease management, but under current delivery models medical-cost savings and clinical improvements are unclear.**

conducted on specific wellness-promotion programs. While the outcomes of these programs are not clear, they clearly come with costs.<sup>69</sup>

We did not explicitly consider prevention efforts, but we note that the U.S. Preventive Services Task Force recommendations are solidly evidence based and their cost effectiveness has been examined.<sup>70</sup> Many of these are promoted through insurance coverage legislation and pay-for-performance (P4P) programs. We feel that encouraging such evidence-based efforts is consistent with our vision for improved quality and efficiency.

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## AND THE WINNERS ARE...

Reducing healthcare spending from 16% of GDP to 12% could give a huge boost to the U.S. economy, and we believe it can happen even as we (and because we) improve the quality of healthcare. This reduction can help fuel coverage for the uninsured, who are among the biggest winners in our vision. The change will surely allow innovators to succeed, as well as those who adapt to the new efficiency/quality paradigm, but it will hardly be a win-win for everyone in the healthcare industry.

Some of the other winners are also easy to see:

- Patients and consumers will be big winners, with better care at lower cost.
- Workers, whose wages have been depressed by higher healthcare costs, and retirees whose fixed incomes have been strained by rising healthcare costs.
- The U.S. economy as a whole, which will see costs decrease.
- Social insurance programs, whose funding crisis will be eased.
- Taxpayers who fund social insurance programs.
- Healthcare workers, including physicians, who practice in organized systems of care designed to deliver efficient healthcare.
- Innovators who develop lower-cost, more efficient, and/or higher-quality care delivery.

However, any economic change or technological advancement creates losers. The losers will likely include:

- Some hospitals and other providers, their managers, and their suppliers, who are unable to adapt as evidence-based medical practices reduce demand, and as priorities shift from revenue maximization to improving efficiency
- Some insurers, especially if they are unable to make the transition to more streamlined operations
- Some health-related manufacturers, suppliers, middlemen, and distributors, as evidence-based medicine and comparative effectiveness approaches standardize and commoditize processes
- Benefits consultants and insurance brokers as streamlined processes require fewer intermediaries to manage inefficiency and friction costs

It is difficult to generalize about how physicians and other healthcare workers will fare under a smaller system. Certainly, many of the paperwork burdens and frustrations will go away, and these workers will have the benefits of patient-focused systems instead of processes designed to meet the needs of bureaucracies. Some physicians will benefit from performance-based compensation. More care will be community based instead of in hospitals and nursing homes. Primary, preventive, and compassionate care will grow.

We believe the economy overall will be a winner. In this economic downturn, it may be controversial to reduce any spending. However, lower healthcare costs will take some pressure off labor costs and possibly ease the pressure to reduce employment levels. Although the employer may pass some of the reduced healthcare costs back to workers in the form of higher wages, reduced healthcare costs may help the employer avoid staff reductions or even help increase staff.

If waste can be removed from healthcare services without compromising quality, it can be expected that the money spent on healthcare will be spent elsewhere. Consequently, the 12% model is not a reduction in GDP but a redistribution, and presumably one that produces better economic conditions. Expenditures for unnecessary healthcare can be used for more desirable goods and services.

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## METHODOLOGY

This section summarizes the methodology used in producing the 16% and 12% figures shown.

### A primer on actuarial models for healthcare

The work of actuaries often requires them to assess the risk and financial outcomes of insurance products and insurers, and actuaries are often called on to assess other kinds of outcomes. This applies to actuaries' work in healthcare as well as life insurance, property-casualty insurance, and pensions. Actuaries analyze data and construct mathematical models to perform their work.<sup>71</sup> The profession is principles based<sup>72</sup> rather than rules based, and the approaches and considerations actuaries typically use are described in the *Actuarial Standards of Practice*<sup>73</sup> and other actuarial literature. Actuaries working in different industries or on different problems use different models, of course, but common elements include using probabilities, considering the timing of events, and evaluating business consequences.

**To meet business needs, actuaries are accustomed to building models with assumptions from multiple sources.**

To meet business needs, actuaries are accustomed to building models with assumptions from multiple sources. Actuaries use historical experience, sources from medical literature, epidemiological studies, government and actuarial publications, other sources as available, and professional judgment to set assumptions and choose methodologies. Sensitivity testing, monitoring new information, and comparing actual results to those forecast by the model are techniques actuaries may use to improve their models.

Because data quality will affect the reliability and validity of their conclusions, actuaries generally pay close attention to data issues. Healthcare data almost always has known or unknown limitations, and the medical claim and demographic data that actuaries frequently use are subject to instability from changes in business practices (e.g., claim processing changes), technology changes (e.g., newly approved procedures), environmental changes (e.g., the severity of the influenza season or an insurer's membership turnover), and other factors. Consequently, actuaries have developed and use normative models as a tool for identifying potential data issues and to help recognize and investigate business trends.

To understand and forecast health insurance programs,<sup>74</sup> actuaries frequently use actuarial cost models that present costs in per member per month (PMPM) terms. While there is no single officially approved approach, the actuarial cost models that are commonly used for commercial as well as Medicare and Medicaid programs have similar formats, as described below.

Actuaries use actuarial cost models mostly to develop the premium rates insurers charge or to analyze the insurer's financial results. However, these models are useful for many other purposes, including forecasts, which is how we used the models in this paper. (We note that there are other distinct actuarial models in common use for other applications, such as estimating outstanding claim liabilities.)

Commonly available health insurance covers a wide variety of healthcare services, and the services can have very different characteristics. For example, hospital admissions are very different from office visits or prescription drugs (hospital admissions are more expensive and less frequent). For this reason, health cost models often separately consider different kinds of services. The level of detail depends on the model's purpose. Some models show details at individual procedure-code levels (e.g., CPT<sup>™</sup> codes<sup>i</sup> or HCPCS codes), while others use more aggregated categories such as hospital inpatient, hospital outpatient, physician, prescription drugs, etc. The Milliman *Health Cost Guidelines* models we used for this paper contain close to 100 service categories, which are defined at a very granular level (such as by provider type, site of service, CPT code, or diagnosis code).

Health actuarial cost models often show the following for each service category:

- Utilization (or frequency, generally expressed as annual procedures, services, admissions, days, or other unit per thousand members)

<sup>i</sup> Trademark of the American Medical Association (AMA)

- Unit cost (average allowed charge per unit in dollars, before patient cost sharing, such as deductibles or copays)
- Gross PMPM before cost sharing (calculated as utilization × unit cost/12,000)
- Cost sharing per unit of service
- Cost sharing PMPM (calculated as utilization × cost sharing/12,000)
- Net PMPM (calculated as gross PMPM less cost sharing PMPM)

Other factors in a cost model may include consideration of single or family out-of-pocket limits, population and morbidity assumptions, deductibles, other benefit features, administrative costs, reinsurance, and surplus. The factors of actuarial models may be inputs or outputs; for example, cost sharing might be modified to reach a target net PMPM, or the net PMPM may reflect cost-sharing targets.

### Key steps in our methodology

Our cost model development starts with current total U.S. healthcare spending divided into broad categories. Figure 1 in the Executive Summary shows our starting point.

Understanding where current healthcare spending goes is a critical part of our model. The *Milliman Healthcare Reform Model* contains cost details for U.S. subpopulations (market segments), including spending by healthcare service category. Its assumptions are based on a variety of sources, including proprietary databases, the U.S. 2008 Statistical Abstract, Centers for Medicare and Medicaid Services, the 2008 Medicare Trustees Report, and Census Bureau data. We also used the *Reform Model* to broadly define our starting service category allocations, which were refined based on a combination of the 2008 Milliman Medical Index and Milliman's *Health Cost Guidelines*. A summary of these service category allocations appears in the table in Figure 4.

**FIGURE 4: CURRENT COSTS BY SERVICE CATEGORY (REFLECTS ALL MARKET SEGMENTS)**

UTILIZATION CATEGORY	2008 ESTIMATE (\$ BILLIONS)
INPATIENT FACILITY	\$500
SKILLED NURSING FACILITY	\$49
HOME HEALTH	\$64
OUTPATIENT FACILITY	\$257
PROFESSIONAL, INPATIENT SURGERY	\$55
PROFESSIONAL, OUTPATIENT SURGERY	\$88
INPATIENT VISITS	\$27
OFFICE VISITS / MISC.	\$157
OTHER PROFESSIONAL	\$225
OTHER MEDICAL	\$54
PRESCRIPTION DRUGS	\$249
DENTAL	\$102
NURSING HOME, OTHER LTC	\$218
VISION	\$22
OVER-THE-COUNTER DRUGS	\$22
ADMINISTRATION	\$166
OTHER (RESEARCH, ETC.)	\$135
<b>TOTAL SPEND</b>	<b>\$2,388<sup>i</sup></b>

Source: Milliman Healthcare Reform Model

i Total is not the sum of the column due to rounding.

We modeled shifts in these service categories to reflect allocations based on a well-managed healthcare delivery system. We used known commercial and Medicare allocations from Milliman's *Health Cost Guidelines*, and assumed a blend for the market segments of Medicaid and other covered populations.

#### **Reducing costs with better utilization**

There were a number of ways we could move current spending to reach the 12% goal. The method we chose was to use the actuarial models that show normative values for utilization and unit cost based on actual health plan experience. For more than 50 years, Milliman has created normative actuarial models that reflect how benefit designs affect premium rates and for other purposes. During the past 20 years, these models have also captured the observed utilization and cost variations among health plans that correspond to more or less efficient clinical practice patterns and delivery systems. We have also extended these models to apply to social insurance programs. These models are licensed to the actuarial departments of the majority of large insurers in the United States. These actuarial models, like the estimates of waste and comparisons to other countries, could produce cost reductions greater than the 25% modeled for this report.

The well-managed models in our *Health Cost Guidelines* do not reflect any particular healthcare system; rather, they are a composite of best observed practices. Several organized systems of care—those where the physicians work together and have a significant influence on hospital practice—produce results that are close.

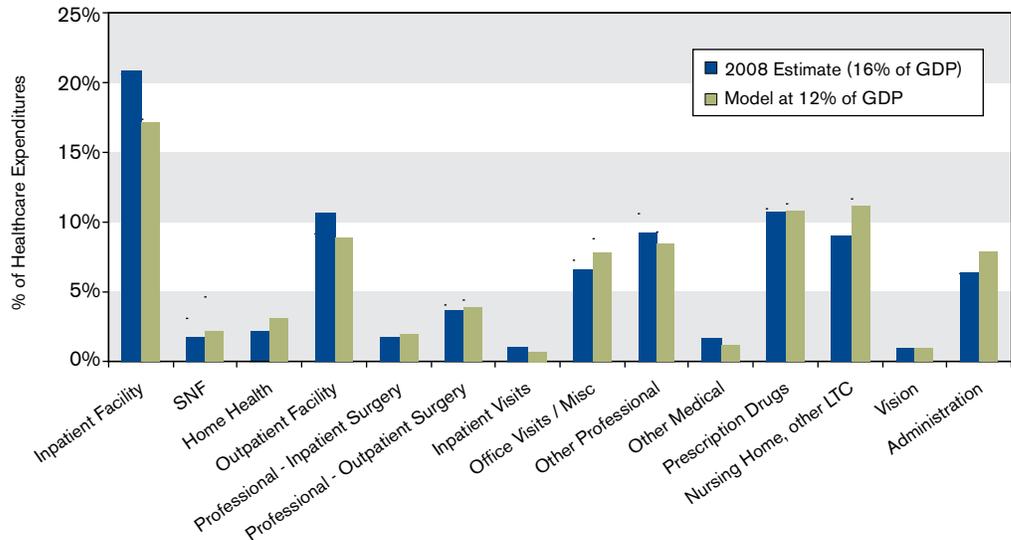
The service categories we used in our model are defined in the table in Figure 5.

**FIGURE 5**

<b>UTILIZATION CATEGORY</b>	<b>DESCRIPTION</b>
<b>INPATIENT FACILITY</b>	Hospital use for an inpatient stay in short-term hospitals.
<b>SKILLED NURSING FACILITY (SNF)</b>	Nursing facility use for an approved skilled nursing facility.
<b>HOME HEALTH</b>	Home visits by a home health professional (excludes custodial care).
<b>OUTPATIENT FACILITY</b>	Facility use for services provided in an outpatient facility setting (excludes professional charges). Includes emergency room, surgery, radiology, pathology, pharmacy, blood, cardiovascular, physical, occupational, and speech therapy, and other services.
<b>PROFESSIONAL, INPATIENT SURGERY</b>	Professional services for surgery by a primary surgeon, services by an assistant surgeon, and anesthesia for surgeries performed on an inpatient basis.
<b>PROFESSIONAL, OUTPATIENT SURGERY</b>	Professional services for surgery by a physician and anesthesia for surgeries performed in a hospital outpatient department, freestanding surgical facility, or physician's office.
<b>INPATIENT VISITS</b>	Physician visits to a hospital or skilled nursing facility.
<b>OFFICE VISITS / MISC.</b>	Visits to a physician's or other professional's office, visits to the insured's home or custodial facility, and some professional case-management services. Includes preventive services such as immunizations, physical, vision, hearing, and speech exams. Miscellaneous services include urgent-care visits, therapeutic injections, allergy testing, immunotherapy, and others.
<b>OTHER PROFESSIONAL</b>	Professional services for emergency room visits, consultations, physical and occupational therapy, cardiovascular services, radiology, pathology, chiropractor, podiatrist, psychiatric, and alcohol and drug-abuse outpatient treatment.
<b>OTHER MEDICAL</b>	Includes ambulance, durable medical equipment, prosthetics, and other services.
<b>PRESCRIPTION DRUGS</b>	Outpatient prescriptions ordered by an attending physician and dispensed by a pharmacist.
<b>DENTAL</b>	Dental procedures including diagnostic, preventive, basic, and major dental services. May include orthodontics.
<b>NURSING HOME, OTHER LONG-TERM CARE</b>	Includes custodial services provided in a skilled, intermediate, custodial-care, or assisted-living facility, medical and nonmedical services provided to persons in their residences or in a community-based facility, hospice and respite care, home modifications and equipment, and care-management services.
<b>VISION</b>	Eye exams conducted by a licensed ophthalmologist or optometrist, glasses, and/or contact lenses.
<b>OVER-THE-COUNTER DRUGS</b>	Pharmaceutical products available without a prescription.
<b>ADMINISTRATION</b>	Administrative costs of operating a health plan other than medical services, prescription drugs, and other benefits. Includes marketing and sales, claim-payment services, direct and indirect administration expenses, and the cost of reinsurance.

We applied our models of well-managed U.S. health plans to the healthcare system's current spending by major service category—hospital inpatient, hospital outpatient, physician, etc.—and by major payer categories. In going from 16% of GDP to 12%, some categories of healthcare spending will become a larger portion of total healthcare spending while others will become relatively smaller even as total healthcare spending overall will decrease (Figure 6).

**FIGURE 6: DISTRIBUTION OF SPENDING—AT 16% AND 12%  
(INCLUDES ONLY CATEGORIES WHOSE SPENDING CHANGED BETWEEN THE 16% AND 12% MODELS)**



Sources: Milliman Healthcare Reform Model, Milliman Medical Index 2008, Health Cost Guidelines 2008

## ARE WHO'S INTERNATIONAL HEALTH OUTCOMES RANKINGS APPROPRIATE FOR ADVANCED COUNTRIES?

Since 1995, the World Health Organization (WHO) has published an annual report assessing the status of global health and producing country-specific health statistics. In Figure 7, we show the rankings for healthcare spending among advanced countries, along with nine of the dozens of metrics produced in the 2008 WHO report. The WHO metrics have been widely publicized as portraying the quality of healthcare systems across many countries, although no single metric presents a comprehensive picture. Much of the report's focus is on palpable healthcare problems in the developing world. The United States generally ranks poorly compared to other advanced countries, although there is significant controversy over the validity of many of the WHO metrics for advanced countries.<sup>75</sup>

One controversy is that many WHO metrics describe mortality rates and life expectancy, which can reflect socioeconomic factors—genetics, murder and injury rates, consumption habits, stress levels, etc.—perhaps more than healthcare quality. Neonatal mortality rates depend on how a country measures gestational age and counts premature births, while accurate maternal mortality rates may vary depending on post-delivery tracking. The WHO reports have included financial fairness and similar metrics that may not be common-sense measures of healthcare quality. Compared to other nations, the United States performs better on many prevention measures, particularly cancer screening, although there is still room for improvement.<sup>76</sup> Nevertheless, the WHO reports have raised doubts about whether the high level of healthcare spending in the United States is delivering the value it should.<sup>77</sup>

**FIGURE 7: WORLD HEALTH ORGANIZATION RANKINGS ON QUALITY INPUTS AND OUTPUTS (EQUAL RANKINGS REPRESENT A TIE.)**

(#1 RANK REPRESENTS THE HIGHEST VALUE FOR THE INPUT OR OUTPUT, NOT BEST OR WORST)

30 OECD COUNTRIES	TOTAL EXPENDITURE ON HEALTH AS % OF GDP <sup>i</sup>	PER CAPITA TOTAL EXPENDITURE ON HEALTH AT PPP <sup>ii</sup>	PHYSICIANS PER CAPITA	FEMALE LIFE EXPECTANCY AT BIRTH <sup>iii</sup>	MALE LIFE EXPECTANCY AT BIRTH <sup>iii</sup>	LIFE EXPECTANCY AT BIRTH (BOTH SEXES) <sup>iii</sup>	NEONATAL MORTALITY AT 15 TO 60 YEARS (BOTH SEXES) <sup>iii</sup>	PROBABILITY OF DYING MORTALITY RATE FOR CARDIOVASCULAR DISEASES <sup>iii</sup>	AGE-STANDARDIZED MORTALITY RATE FOR CANCER <sup>iii</sup>	AGE-STANDARDIZED MORTALITY RATE <sup>iii</sup>	MATERNAL MORTALITY
USA ACTUAL	1	1	21	24	22	24	5	6	12	18	5
USA AT 12% OF GDP	1	?	?	?	?	?	?	?	?	?	?
SWITZERLAND	2	4	3	2	1	2	9	29	25	26	19
FRANCE	3	6	11	2	12	4	22	10	29	11	8
GERMANY	4	10	11	14	12	10	9	15	8	12	20
CANADA	5	5	28	7	6	4	9	21	26	15	12
PORTUGAL	5	23	11	14	22	18	9	9	9	13	5
AUSTRIA	7	7	6	7	12	10	9	17	10	23	20
GREECE	7	15	1	14	12	10	9	18	6	21	26
BELGIUM	9	12	2	14	12	18	22	12	24	9	8
DENMARK	9	9	9	22	20	18	9	11	14	6	26
NEW ZEALAND	11	21	24	14	6	10	9	19	19	14	7
ICELAND	12	11	4	7	1	4	29	22	22	17	20
NETHERLANDS	12	8	6	14	6	10	9	30	21	7	15
ITALY	14	18	6	2	6	4	9	27	20	18	26
SWEDEN	15	14	14	7	1	4	22	27	18	26	26
AUSTRALIA	16	13	22	2	1	2	9	26	27	23	20
NORWAY	16	3	4	7	6	10	22	23	16	16	12
UK	18	17	23	22	12	18	9	16	14	10	8
SPAIN	19	22	14	2	6	4	22	19	28	22	20
JAPAN	20	19	24	1	1	1	29	25	30	25	15
FINLAND	21	20	14	7	20	18	22	8	11	28	12
HUNGARY	21	26	18	27	30	29	3	1	3	1	15
IRELAND	23	16	19	14	12	10	5	21	7	8	30
LUXEMBOURG	24	2	20	7	12	10	9	14	17	18	4
SLOVAKIA	25	27	17	27	29	27	5	3	2	4	15
CZECH REPUBLIC	26	24	9	24	25	25	22	7	5	3	20
S. KOREA	27	25	29	14	22	18	5	13	13	5	3
MEXICO	28	29	26	29	26	2	2	5	23	30	1
POLAND	28	28	26	24	27	26	3	2	4	2	8
TURKEY	30	30	29	30	27	29	1	4	1	29	2

Sources: Organisation for Economic Co-operation and Development (OECD), World Health Organization (WHO), Centers for Medicare & Medicaid Services (CMS), U.S. Department of Commerce (Bureau of Economic Analysis [BEA]), U.S. Census Bureau.

i World Health Statistics 2008, WHO, except for the U.S., where health expenditures were updated from 2005 to 2006 CMS figures, GDP was updated to 2006 actual figures from the U.S. BEA, and census figures were updated to 2006 from the U.S. Census Bureau.  
 ii Purchasing Power Parity (PPP), attempts to normalize the relative purchasing powers of individual countries and allows for direct dollar comparisons.  
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