MILLIMAN RESEARCH REPORT

2018 Milliman Medical Index

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Cover illustration by Andy Rash.

Executive summary

In 2018, the cost of healthcare for a typical American family of four covered by an average employer-sponsored preferred provider organization (PPO) plan is $28,166 (see Figure 1 below), according to the Milliman Medical Index (MMI).[1]

KEY FINDINGS OF THE 2018 MMI INCLUDE:

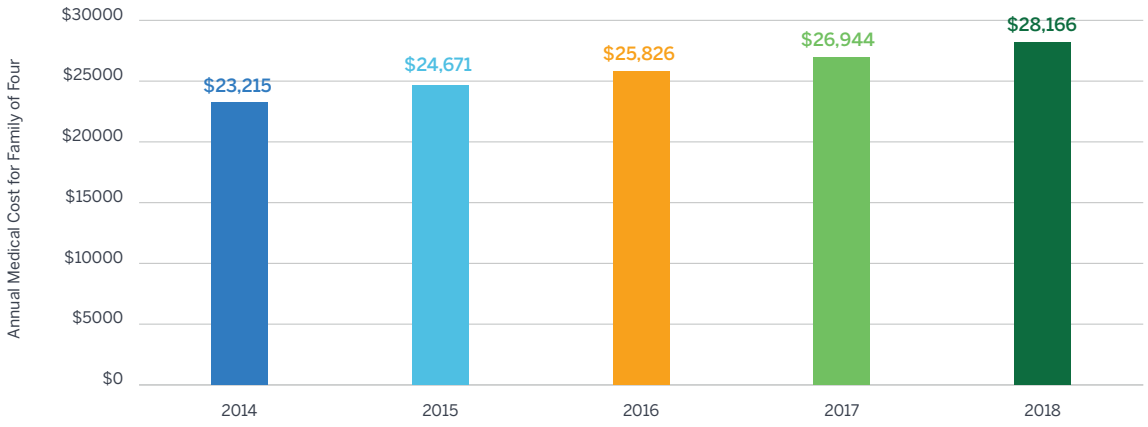
Bad news: The MMI increased by $1,222 from 2017 to 2018. For more than 10 years now, the MMI has been increasing at an average of just over $100 per month.

Good news: At 4.5%, the MMI's annual rate of increase is nearly the lowest in 18 years. Only last year was lower, at 4.3%. Over the 18 years since the MMI was first measured in 2001, the annual rate of increase has averaged 7.4%. But for eight years in a row now, the rates have been below that average. As discussed later in this report, although the MMI's dollar amount continues to grow, the rate at which it grows is clearly slowing.

Prescription drug trends are down for the third consecutive year. Annual increases in prescription drug expenditures for the family of four have declined to levels last seen just prior to the great hepatitis C treatment spike of 2015 (see Figure 2 on page 4). This year's increase is 6.0%. Drug costs will continue to be prone to volatility, however, as new and expensive drugs enter the market, lower cost alternatives emerge, and drug price changes are deployed very quickly.[2]

Employers pay more; employees pay a lot more. The MMI's healthcare expenditures are funded by employer contributions to health plans and by employees through their payroll deductions and out-of-pocket expenses incurred when care is received. Over the long-term, we have seen employees footing an increasingly higher percentage of the total. That trend continues in 2018, with employee expenses increasing by 5.9% while employer expenses increased by only 3.5%.

FIGURE 1: MILLIMAN MEDICAL INDEX (MMI)



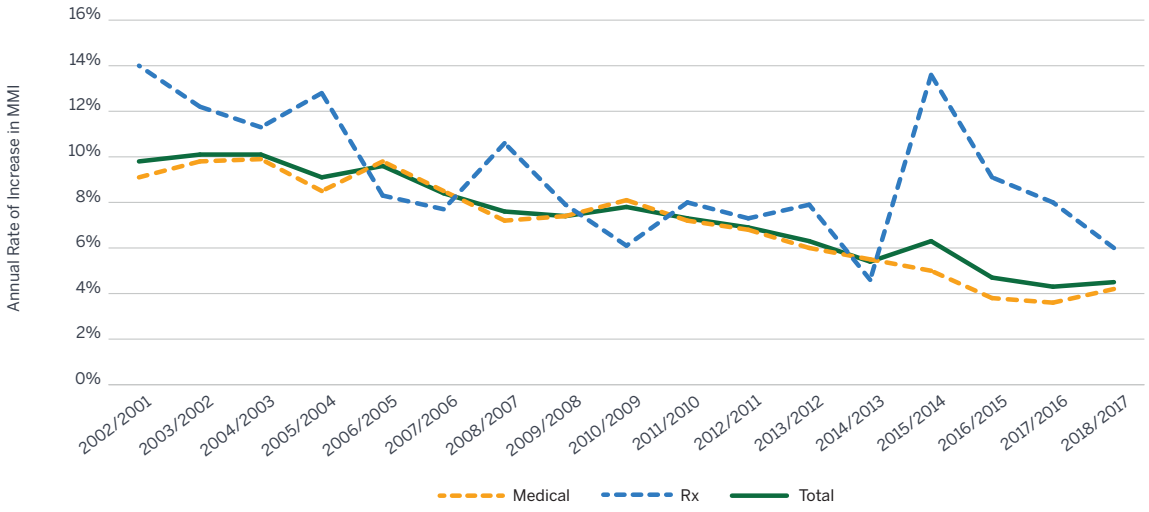
1 The Milliman Medical Index is an actuarial analysis of the projected total cost of healthcare for a hypothetical family of four covered by an employer-sponsored preferred provider organization (PPO) plan. Unlike many other healthcare cost reports, the MMI measures the total cost of healthcare benefits, not just the employer's share of the costs, and not just premiums. The MMI only includes healthcare costs. It does not include health plan administrative expenses or insurance company profit loads.

2 The MMI's prescription drug expenses do not reflect the savings from most manufacturer rebates. Those rebates are discussed more in a later section of this report.

For this year's edition of the MMI, we look back in time and explore what is behind the long-term slowdown in cost increase, drawing on input from Milliman's clients. The popular media is full of stories about the high cost of new healthcare technologies, expensive life-changing or even life-saving new drugs, and the devastating financial impact of healthcare needs on patients and their families. And yet quietly, outside the spotlight, our healthcare financing and delivery systems have evolved in ways that seem to be producing consistent, long-term reductions in expenditure growth rates.

The various major stakeholders in healthcare—healthcare providers and suppliers, plan sponsors, and plan participants—have each contributed in their own way to the declining growth rates. Government also gets some credit, although it is not typically viewed as a stakeholder in the employer health plan market that the MMI measures. However, as we explore in this report, each of these stakeholder groups operating in their own self-interest also hold keys to the barriers which prevent us from taming costs even further.

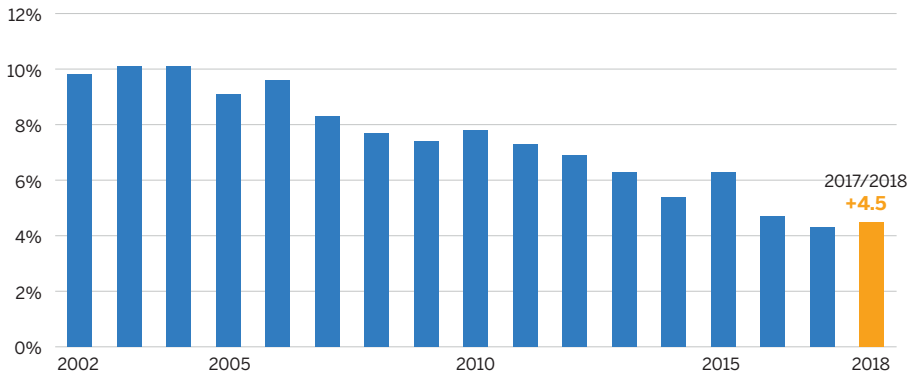
FIGURE 2: ANNUAL CHANGES IN THE MILLIMAN MEDICAL INDEX



Looking at the big picture

One focus of this year's report is to explore a notable trend: Why over the past 18 years has the pace of MMI healthcare costs slowed? Figure 3 illustrates the MMI's annual growth rates since 2001.

FIGURE 3: ANNUAL CHANGES IN MMI GROWTH RATE



This question does not mean to ignore the fact that the overall cost of healthcare for a typical family of four still stands at $28,166—but the decrease in growth rate does tell a story. This year, Milliman solicited input from the industry to get insight on the driving forces. We reached out to key stakeholders across the employer-sponsored healthcare landscape to address the following questions:

- What do you believe are the primary factors contributing to the decline in healthcare cost growth rates for employer-sponsored health plans?
- What forces are keeping cost growth from being even lower?

We found some common themes in the answers to our solicitation that also align with our day-to-day experiences working with healthcare stakeholders.

Provider engagement. Managed care organizations have existed for decades and have lowered costs through utilization management and care coordination programs. While efforts continue in these areas, many stakeholders credit the involvement of healthcare providers with the more recent strides in reducing healthcare cost trends. Various approaches to involving providers in controlling costs (including value-based reimbursement, risk-sharing arrangements, and the increasing prevalence of commercial accountable care organizations [ACOs]) were frequently cited as contributors to the decline in growth rates. Engaging providers through aligned financial incentives is helping to temper trends, but strong incentives are rare in many regions where fee-for-service medicine prevails. As a result, the system still contains financial incentives to provide more care.

> "I also believe costs will not go lower until we change the system to incentivize providers to keep costs low. Despite penalties for readmission etc., you still receive more compensation the more you do. Until that paradigm is changed, nothing else will be effective."
>
> – ACO healthcare executive

Effective provider contracting. Some respondents cited the impact of more sophisticated provider contracting by employers, insurers, and third-party administrators as a factor in reducing trends over time. On the flipside, provider consolidation, including hospital purchase of physician groups and the resulting increased leverage in some markets, keeps trends from being lower.

Plan designs encouraging efficient purchasing. A number of respondents cited increased member cost sharing and high deductible health plans as factors dampening the growth rates. While the shift to high deductible plans is not included in the MMI annual cost change,[3] the MMI does reflect increases in PPO member out-of-pocket costs over time, which can affect healthcare purchasing decisions. Changes insurers and employers are making to plan designs may help steer consumers to appropriate care in cost-effective settings—out of the emergency room, to in-network providers, retail clinics, and standalone centers for services, such as lab and radiology services. However, there is room for consumers to drive additional gains as patients and their doctors still often do not have the information they need to make cost-effective decisions.

Role of the government and public programs. While federal healthcare reform has had little direct impact on the large employer plan costs addressed by the MMI, there are spillover effects. Many of the value-based care initiatives discussed earlier were sparked by developments in the public markets, Medicare most notably. However, as provider payment rates in those public health programs are much lower than employer market payment rates and tend to grow only very slowly, cost shifting to employer plans will continue to be a barrier to further expenditure reductions.

Impact of pharmacy initiatives. Prescription drugs are regularly cited as reasons for the recent cost trend reductions, and for being a barrier to further dampening of cost growth. As can be seen in Figure 2, pharmacy trends have certainly come down over the past 18 years, playing a key role in the reduction in the overall MMI growth rate. Reasons cited for the reduction in prescription drug cost trends include consumerism, continued movement to generics, and more recently, reduced use of some high-cost drugs such as those treating hepatitis C. But drug costs, particularly for the specialty pipeline and emerging gene therapies, continue to be cited as a major reason that total healthcare expenditure growth will most likely not come down further.

> "Specialty drugs and medical pharmacy continue to trend at high rates, both on unit cost (due to manufacturer increases) and utilization (due to new drugs and new indications for existing drugs). Many of these drugs provide great social value treating disease. At the same time, rates for certain drugs can seem unduly inflated."
>
> – Chief actuary, a national healthcare company

As can be seen in the discussion above, many factors have contributed to controlling healthcare cost growth. But change is likely to continue at only a gradual pace. Cost control in the employer market occurs through free-market forces, with demand for changes producing supply. As stakeholders demand cost control, changes are implemented piecemeal, often in the form of checks on the activities of other stakeholders.

3 The MMI reflects expenditures in a typical PPO-style benefit plan with a deductible and coinsurance applied to most hospital services, and copays applied to many physician services. More description is provided in the Technical Appendix to this report.

Often, however, fundamentally incongruent incentives remain. For example, although employers and health plans want to control costs, they also need to offer attractive healthcare benefit plans. Employees would also like costs to be lower, but could accept more responsibility for their own health. Providers are conflicted, too, as healthcare cost reductions often translate into reduced income. These misaligned incentives will likely persist, but they are being addressed to some degree by the downward trend drivers bulleted above. Perhaps some of the newest partnerships in the healthcare arena will be more effective in addressing the incentives and impediments to change.[4]

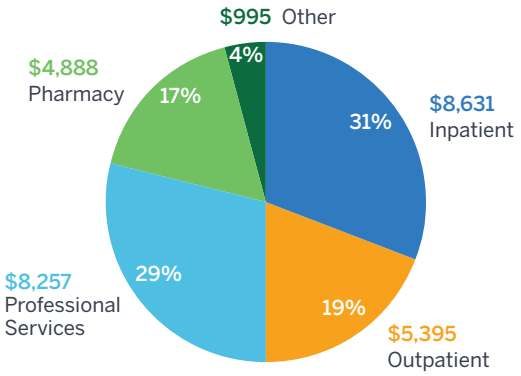
Components of cost

To further explore how the MMI costs have grown, we examine the cost of healthcare in five separate categories of services:

1. Inpatient facility care
2. Outpatient facility care
3. Professional services
4. Pharmacy
5. Other services

As shown in Figure 4, for the MMI family of four, approximately one-half of healthcare expenditures are for hospital services, including both inpatient and outpatient. The total increase in hospital expenses from 2017 to 2018 was only 4.8%, its third-lowest rate of increase since the MMI was first measured in 2001, but higher than last year's 3.9% increase. Inpatient hospital costs grew by 4.5% and outpatient costs grew by 5.2%.

FIGURE 4: 2018 MMI COMPONENTS OF SPENDING



The second-largest category of medical expenditures is physician services, which represents 29% of the family of four's healthcare spending in 2018. These expenditures are for all professional fees, including those from physicians and other healthcare professionals that are incurred when a patient uses a hospital, clinic, surgical center, standalone lab or imaging center, or a physician office. When the MMI was first measured back in 2001, physician expenses were 40% of the total. Over the years, the annual rate of increase in physician expenses has averaged 5.3%, while all other expenditures averaged 8.5%. Physicians now collect a smaller slice of the healthcare expenditures pie, although the pie's size has grown immensely.

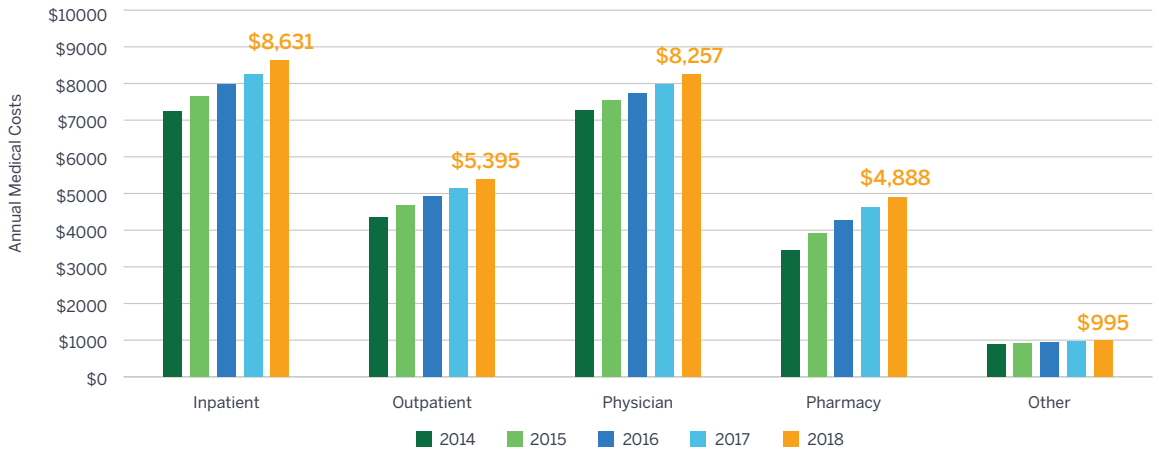
Outpatient prescription drugs continue to be an increasingly important driver of MMI expenditures. Because prescription drug expenses have grown more quickly than other healthcare costs, outpatient drugs (e.g., those obtained from a retail pharmacy) have increased from 13.2% of the total MMI in 2001 to 17.4% in 2018. In other words, more than one-sixth of the family of four's healthcare expenses now go to prescription drugs. Further, these figures do not include medications delivered to patients in hospitals, outpatient infusion centers, and physician offices.[5] When you throw those costs in, the total cost of all drugs represent more than 20% of a family's healthcare expenditures.

The remaining 4% of expenditures is for "other" services, which includes home healthcare, ambulance services, durable medical equipment, and prosthetics.

4 For comments on one example, see **http://us.milliman.com/Five-ways-the-Amazon-Berkshire-Hathaway-JPMorgan-Chase-deal-could-change-healthcare-in-the-US/**.

5 Those medications are included in the hospital and physician services portions of the MMI.

FIGURE 5: MMI ANNUAL SPENDING GROWTH BY COMPONENT OF CARE



Point of sale prescription drug rebates

The financing of prescription drugs is complex and one contributing factor continues to be the increasing prevalence of manufacturer rebates. The issue is that the retail price for a brand name prescription at the pharmacy counter is often far more than its true cost—sometimes the rebates are as much as 50% or more of the retail price. Why? Drug manufacturers pay large rebates to pharmacy benefit managers (PBMs) and plan sponsors (e.g., insurers or employers) to include these drugs on insurance plans. However, those rebates often only make their way back to the consumer in terms of insurance premium reductions spread across all consumers rather than discounts at the drug counter for the people taking these drugs.

With more brand name and specialty drugs now subject to deductibles and coinsurance rather than flat dollar copays, some PBMs have begun to price drugs net of rebates at the point of sale so consumers most affected by the high costs reap the rebates' rewards. Doing so reduces the sticker price of high-cost drugs and helps consumers reduce their out-of-pocket spend at the pharmacy, but at the expense of marginally increasing premiums for all consumers.

Figure 6 shows what a member with the MMI's PPO coverage pays for an illustrative $200 brand drug under the current situation where rebates of 35% are paid solely to the employer.

Figure 7 shows what the same member would pay under the same situation except the drug rebate is applied at the point of sale to reduce the member's cost. The member's out-of-pocket cost is 35% lower in this scenario ($50 versus $32.50) as they gain the full benefit of the additional discount provided by the rebate.

FIGURE 6

BRAND DRUG COST	$200.00
25% MEMBER COINSURANCE	- $50.00
DRUG REBATE	- $70.00
EMPLOYER COST	= $80.00

FIGURE 7

BRAND DRUG COST	$200.00
DRUG REBATE	- $70.00
BRAND COST LESS REBATE	= $130.00
25% MEMBER COINSURANCE	- $32.50
EMPLOYER COST	= $97.50

To be sure, point of sale rebates are not this straightforward and stakeholders must weigh a number of issues as they consider this method of claims administration. For example, in many instances, people who benefit most from rebates also meet their health plan's out-of-pocket maximum so they really see no benefit from this change. Similarly, people with flat dollar copays pay the same amount regardless of the drug's price. A related challenge is that most rebates are determined well after the drugs are sold, making it difficult to estimate an accurate rebate at the point of sale. Another downstream effect is that premiums need to be set slightly higher as the rebate savings are shared more with the people using these drugs rather than the entire insured population. Given all the issues at hand, careful evaluation of point-of-sale rebate programs is needed as these options become more prevalent in the market.

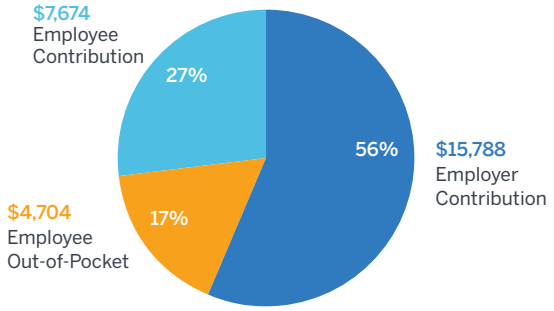
Employees' share of healthcare costs

The total cost of healthcare for the MMI family of four is shared by employers and employees. To clearly define each payment source, we use three main categories:

1. **Employer subsidy.** Employers that sponsor health plans subsidize the cost of healthcare for their employees by allocating compensation dollars to pay a large share of the cost. The portion paid by the employer typically varies according to the benefit plan option the employee selects.
2. **Employee contribution.** Employees who choose to participate in the employer's health benefit plan typically also pay a substantial portion of costs, usually through payroll deduction.
3. **Employee out-of-pocket cost at time of service.** When employees receive care, they also often pay for a portion of these services via health plan deductibles and/or point-of-service copays. While these payments are capped by out-of-pocket maximums, as legislated by the Patient Protection and Affordable Care Act (ACA),[6] the costs can still be substantial.

Figure 8 shows the relative proportions of the three categories we track annually. Employers continue to subsidize their employees' healthcare costs by paying an average of 56% of the total cost in 2018. Of the $28,166 total cost for a typical family of four, the employer pays about $15,788 while the employee pays the remaining $12,378, which is a combination of $7,674 in employee payroll deductions and $4,704 in out-of-pocket costs paid when using healthcare services.

FIGURE 8: RELATIVE PROPORTIONS OF 2018 MEDICAL COSTS



The percentage growth of employee costs has outpaced employer growth for nine of the past 10 years. In 2018, employees pay almost 44% of healthcare costs, compared to under 40% in 2008. So not only are healthcare costs continuing to increase but employees are also covering more of those costs than they ever have in the past. As a result, the gap between employer and employee shares continues to slowly narrow. Healthcare expenses have grown at rates that make it increasingly difficult for employers to continue funding the benefits. Employer responses, such as defined contribution funding or simply limiting the increase in their contributions to healthcare benefits, have transferred more of the expenditure growth risk to employees.

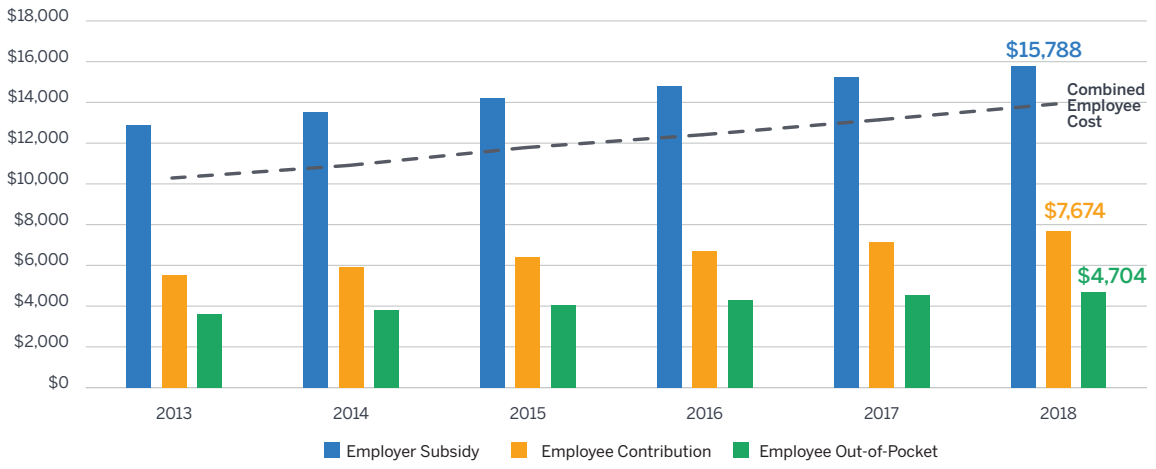
6 Out-of-pocket maximums for 2018 must not exceed $7,350 per person and $14,700 per family.

Figures 9 and 10 provide additional information on how cost sharing has evolved over time. Employers adjust benefits each year in line with their healthcare budget constraints. In 2018, employers assumed $529 of the total increase in the cost of care for the family of four. The total employer subsidy increased by 3.5% from 2017 to 2018. Employees saw a greater increase, at 5.9%, or $693 ($523 from increased payroll deductions and $170 from higher out-of-pocket expenses). In other words, while both employer and employee costs increased, the employee had a larger increase in costs.

FIGURE 9: ANNUAL INCREASE IN SPENDING SPLIT BY EMPLOYER AND EMPLOYEE PORTIONS

	2014/2013	2015/2014	2016/2015	2017/2016	2018/2017
EMPLOYER SUBSIDY	4.9%	5.0%	4.2%	3.2%	**3.5%**
EMPLOYEE PORTION					
EMPLOYEE CONTRIBUTION	6.6%	8.5%	4.8%	6.5%	7.3%
EMPLOYEE OUT-OF-POCKET	5.2%	7.3%	6.2%	5.1%	3.7%
EMPLOYEE TOTAL	6.0%	8.0%	5.3%	5.9%	**5.9%**
TOTAL FOR EMPLOYER + EMPLOYEE	5.4%	6.3%	4.7%	4.3%	4.5%

FIGURE 10: MEDICAL COST BY SOURCE OF PAYMENT



Technical appendix

The Milliman Medical Index (MMI) is made possible through Milliman's ongoing research on healthcare costs. The MMI is derived from Milliman's flagship health cost research tool, the Health Cost Guidelines™, as well as a variety of other Milliman and industry data sources, including Milliman's MidMarket Survey.

The MMI represents the projected total cost of medical care for a hypothetical American family of four (two adults and two children) covered under an employer-sponsored PPO health benefit program. The MMI reflects the following:

- Nationwide average provider fee levels negotiated by insurance companies and preferred provider networks
- Average PPO benefit levels offered under employer-sponsored health benefit programs [7]
- Utilization levels representative of the average for people covered by large employer group health benefit plans in the United States

The ACA introduced the concept of "metallic tiers" for benefit plans starting in 2014. Individual and small group policies must have a metallic tier level of "bronze" or higher (silver, gold, and platinum). Bronze implies that, on average, the plan will pay 60% of the costs for the essential health benefits (EHBs) that must be provided by the benefit plan. To help avoid penalties, larger employers must provide plans that, on average, pay at least 60% of the cost of covered services, a threshold deemed "minimum value." The MMI plan has an actuarial value of approximately 83.3% in 2018.

VARIATION IN COSTS

While the MMI measures costs for a typical family of four, any particular family or individual could have significantly different costs. Variables that affect costs include:

- **Age and gender.** There is wide variation in costs by age, with older people generally having higher average costs than younger people. Variation also exists by gender. Our MMI-illustrated family of four consists of a male age 47, a female age 37, a child age 4, and a child under age 1. This mix allows for demonstration of the range of services typically utilized by adult men, adult women, and children. Average utilization and costs of specific services will be different for other demographic groups.
- **Individual health status.** Tremendous variation also results from health status differences. People with severe or chronic conditions are likely to have much higher average healthcare costs than people without these conditions.
- **Geographic area.** Significant variation exists among healthcare costs by geographic area because of differences in healthcare provider practice patterns and average costs for the same services. For example, the relative cost of living affects healthcare costs, as labor costs (e.g., nurses and technicians) tend to be higher in areas where the cost of living is higher. Access to advanced technology also affects the utilization of services by geographic area.
- **Provider variation.** The cost of healthcare depends on the specific providers used. Even in the same city, costs for the same service can vary dramatically from one provider to another. The cost variation results from differences in billed charge levels, discounted payment rates that payers have negotiated, and implementation of payment methodologies that may influence utilization rates, such as capitation or case rates.
- **Insurance coverage.** The presence of insurance coverage and the amount of required out-of-pocket cost sharing also affects healthcare spending. With all other variables being equal, richer benefit plans usually have higher utilization rates and costs than leaner plans.

7 For example, for 2018, average benefits are assumed to have an in-network deductible of $1,026, various copays (e.g., $160 for emergency room visits, $34 for physician office visits), and coinsurance of 19% for other medical services. Prescription drugs are assumed to have an $11 copay for generics, and coinsurance of 25%/40%/30% on preferred brand, non-preferred brand, and specialty drugs, respectively.

Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

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