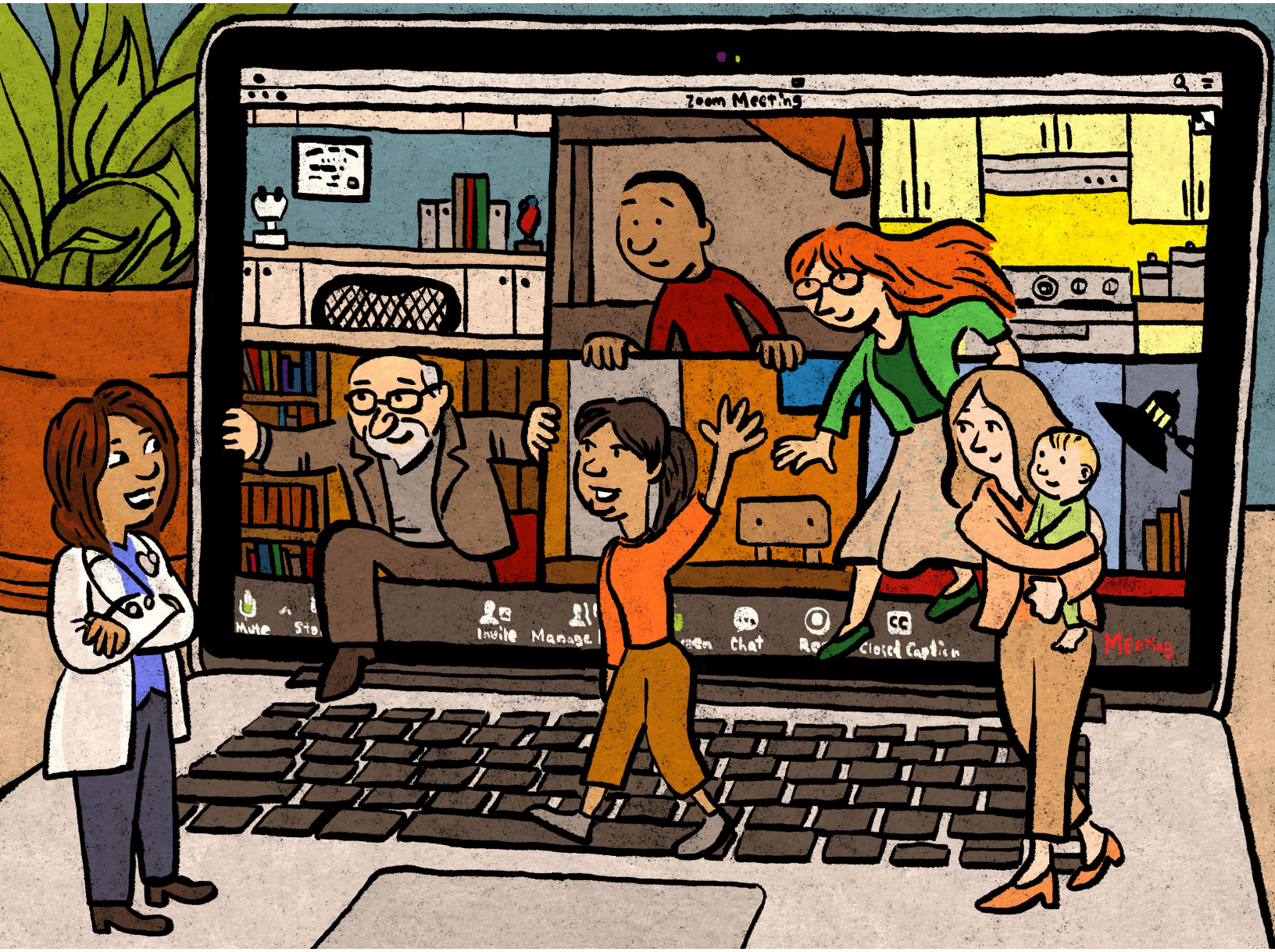
MILLIMAN RESEARCH REPORT

2021 Milliman Medical Index

May 2021

Paul Houchens, FSA, MAAA
Dave Liner, FSA, CERA, MAAA
Annie Man, FSA, MAAA, PhD
Andrew Naugle, MBA
Doug Norris, FSA, MAAA, PhD
Scott Weltz, FSA, MAAA



Milliman

Table of Contents

Cover illustration by Andy Rash.

Executive summary

In 2021, the cost of healthcare for a hypothetical American family of four covered by an average employer-sponsored preferred provider organization (PPO) plan is $28,256, according to the Milliman Medical Index (MMI).[1,2]

KEY FINDINGS OF THE 2021 MMI INCLUDE:

Figure 1 summarizes restated MMI family values from 2019 through 2021.

FIGURE 1: ANNUAL HEALTHCARE COST FOR MMI FAMILY OF FOUR

The 2021 MMI is based on 2019 claims data projected to 2021 with estimated healthcare cost increases. With this approach, we estimate a 2021 MMI value and restate 2020 and 2019 MMI values because we have more recent information from last year's publication.

2020: LOOKING BACK

For the first time in the history of the MMI, healthcare costs decreased year over year with our restated 2020 MMI being 4.2% lower than the 2019 MMI value. Eliminated and deferred care has more than offset the cost of COVID-19 testing and treatments. All categories of healthcare costs except prescription drugs with and without rebates are lower in 2020 compared to 2019.

We published last year's MMI on May 21, 2020, near the beginning of the COVID-19 pandemic. At that time, we suspected that the pandemic would have an effect on healthcare costs but we did not have enough data to understand the duration and extent of the impact. We now know much more about how COVID-19 has affected 2020 but there is still much unknown for 2021 and beyond.

Our 2020 MMI report suggested that COVID-19 testing and treatment costs "may be dwarfed by the spending reductions resulting from deferrals of care." This hypothesis turned out to be true although it appears that much of the care has actually been eliminated rather than deferred. It is unclear to what extent this eliminated care will lead to future adverse health outcomes, if any.

The year 2020 was unique in many regards. Lifestyle changes may have contributed to less demand for acute care in the short term. Digital health, telehealth, and mail-order pharmacy utilization increased as individuals accessed care in new ways. It is uncertain whether these new behaviors will persist, revert to pre-COVID-19 behaviors, or change in some new way when the public health emergency is over.

Last year, we examined the effects of managed care on healthcare costs. Care management will be a key in controlling healthcare costs in 2021 and beyond, perhaps by leveraging the new care access habits formed by many individuals during the height of the pandemic.

1 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, pharmacy rebates, or insurance company profit loads.

2 As discussed in the following section of this report, the 2021 MMI dollar amount is not directly comparable to the amount published in last year's MMI report. This year's figure and last year's figure differ due to the availability of more current cost information, in addition to the one-year impact of healthcare cost inflation.

2021: LOOKING AHEAD

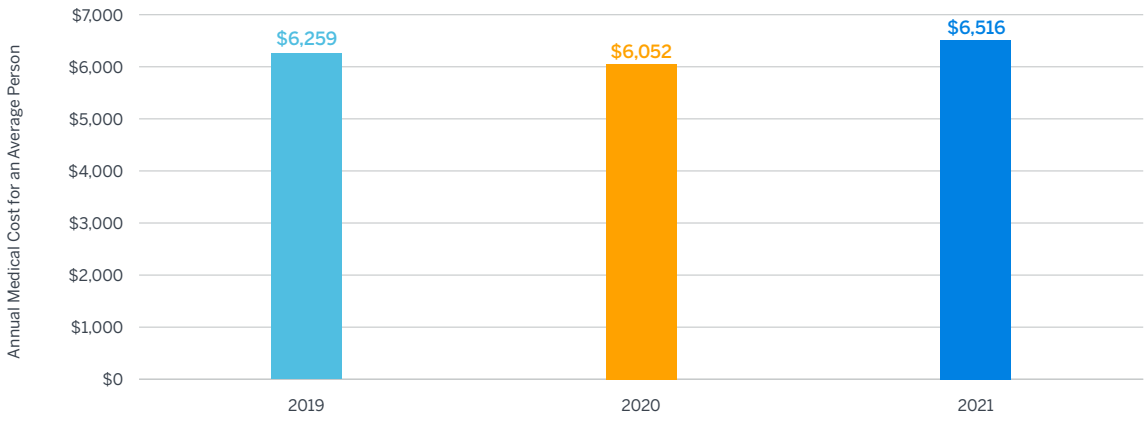
We project healthcare costs will grow by approximately 8.4% for the MMI family from 2020 to 2021. This rate, driven by a forecasted rebound in healthcare utilization, is higher than historical healthcare cost increases and gross domestic product (GDP) growth over the past five years.[3]

As we look ahead to 2021, we are faced with more uncertainty than ever before. COVID-19 vaccine penetration rates and efficacy, public health policy and individual responses to new developments, and new utilization patterns and behaviors all add to this uncertainty. However, we have never been better equipped to navigate this new level of uncertainty. Our resources, including our COVID-19 modeling suite, Milliman's Health Trend Guidelines, and Milliman's MedInsight® Emerging Experience data, give us an early look at how healthcare costs are shaping around COVID-19.

What the MMI represents

Since its first publication in 2005, the MMI has proven a valuable measure of healthcare costs and changes in those costs for a hypothetical "typical American family of four." We have always defined that family as a male age 47, a female age 37, a child age 4, and a child under age 1. In reality, family compositions vary, and different families can experience different levels of healthcare expenses. This variation results from differences in family size, the family members' ages and genders, where they live, their income levels, their unique health conditions, and a host of other variables. Figure 2 summarizes MMI average person values from 2019 through 2021.

FIGURE 2: ANNUAL HEALTHCARE COST PER PERSON



Changes in healthcare costs are different for the average person, the MMI family, and other groups of people. Our interactive tool gives readers the ability to see health costs for the MMI family and different groups of people.[4] While the "typical family of four" construct has allowed us to maintain consistency across the years, we recognize that variations from the averages can be significant and there is not a single typical American family. The remainder of this report will discuss healthcare costs for the average person.

3 Real GDP increased by approximately 1.0% per year over the five-year period ending in 2020. See **https://www.bea.gov/data/gdp/gross-domestic-product** (accessed May 19, 2021).

4 Visit the MMI interactive tool to build your own family and understand their healthcare costs: **milliman.com/mmifamilies**

COVID-19

As we navigate through the second year of the global COVID-19 pandemic, we find ourselves with enough emergent data to begin analyzing the pandemic's impact on U.S. healthcare costs. Certainly the largest pandemic in the era of managed healthcare, COVID-19 not only caused immense strain on hospitals and inpatient care settings nationwide, the fear of infection caused many people to defer and eliminate avoidable healthcare; additionally, some employees lost their jobs (and the employer-sponsored medical coverage that came along with it).[5, 6]

The impacts on health costs were (and continue to be) myriad in nature. Healthcare is a local phenomenon, and the pandemic continues to ebb and flow as vaccinations offset the introduction of new variants. These counteracting factors will impact future health trends to some degree for years to come. With that said, we now have reasonably good data on the impact from the pandemic's initial wave in the spring of 2020; this period had the greatest impact on overall medical trends, because the nationwide fear of infection and government-mandated suspension of elective care[7] was at its greatest during the spring 2020 months. The second wave (late in 2020) had more overall hospitalizations than the earlier wave, yet more of the country felt comfortable seeking elective care (relative to the spring), leading to a more muted impact on trends.

According to a March Peterson-KFF Health System Tracker report, health services spending decreased by 2.7% (seasonally adjusted) from 2019 to 2020, the first time in recorded history that overall U.S. health spending has decreased from one year to the next.[8] We also collected proprietary data from our Milliman Health Trend Guidelines and Milliman's MedInsight Emerging Experience data. Our data exhibits a similar (and slightly starker) conclusion; we estimate that healthcare costs decreased by 3.3% from 2019 to 2020 for an average person. We saw costs decrease across all service categories other than prescription drugs.

FIGURE 3: MMI AVERAGE PERSON COST TREND, CY2018 TO CY2021[9]

SERVICE CATEGORY	CHANGE FROM 2018 TO 2019	CHANGE FROM 2019 TO 2020	CHANGE FROM 2020 TO 2021
INPATIENT FACILITY CARE	2.1%	-4.2%	10.2%
OUTPATIENT FACILITY CARE	2.8%	-6.4%	8.0%
PROFESSIONAL SERVICES	2.3%	-6.8%	8.3%
PHARMACY	5.3%	7.2%	4.3%
OTHER	3.9%	-6.8%	8.1%
TOTAL	**3.1%**	**-3.3%**	**7.7%**

5 Milliman's COVID-19 Advanced Population Shift (CAPS) model develops regional estimates of pandemic-related market shifts (demographics and morbidity). Additional details at: **https://us.milliman.com/en/insight/the-covid19-recession-and-healthcare-coverage-in-the-us**.

6 Fronetin, P. & Woodbury, S.A. (January 11, 2021). Update: How many Americans have lost jobs with employer health coverage during the pandemic? Commonwealth Fund. Retrieved May 19, 2021, from **https://www.commonwealthfund.org/blog/2021/update-how-many-americans-have-lost-jobs-employer-health-coverage-during-pandemic**.

7 Ambulatory Surgery Center Association (April 20, 2020). State Guidance on Elective Surgeries. Retrieved May 19, 2021, from **https://www.ascassociation.org/asca/resourcecenter/latestnewsresourcecenter/covid-19/covid-19-state**.

8 Cox, C., Amin, K., & Kamal, R. (March 22, 2021). How Have Health Spending and Utilization Changed During the Coronavirus Pandemic? Peterson-KFF Health System Tracker. Retrieved May 19, 2021, from **https://www.healthsystemtracker.org/chart-collection/how-have-healthcare-utilization-and-spending-changed-so-far-during-the-coronavirus-pandemic**.

9 CY2018 to CY2019 trends are based upon actual (and essentially completed) data, CY2019 to CY2020 trends are restated based upon information at the time of publication, and CY2020 to CY2021 trends are projected.

As we hope to return to some level of normalcy in 2021, what we see is that the pandemic has led to a "lost year" of medical trend, which can be seen in Figure 3 above. There is still much that we do not know about the future, and the answer will be largely determined on how communities react to the virus' evolution, and approaches and measures designed to combat future outbreaks.

Components of cost

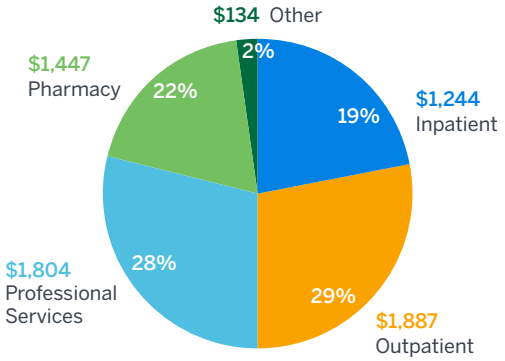
The MMI breaks up healthcare costs into five categories of services:

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

As shown in Figure 4, for the MMI's average person covered by an employer-sponsored PPO plan, approximately one-half of healthcare expenses are for hospital services, including both inpatient and outpatient services. After increasing by 2.5% from 2018 to 2019, emerging data from 2020 suggests that total hospital expenses (inpatient plus outpatient) decreased by 5.6% from 2019 to 2020, driven by the significant reduction in elective care from March through May 2020.[10] In 2021, we are projecting that the increase in hospital costs will jump up to 8.9%, driven by pent-up demand for services as the COVID-19 pandemic abates.

For the average person, approximately 19% of total expenses are attributable to inpatient hospital services, as shown in Figure 4. However, inpatient hospital costs for very young people are higher, due to complications associated with birth and infancy. For the MMI's hypothetical family of four, which includes a child age less than 1, approximately 33% of total expenses are attributable to inpatient hospital services. These variations are illustrated in the updated MMI interactive tool, which also gives users the option of exploring cost allocations for other individual and family constructs.

FIGURE 4: 2021 MMI COMPONENTS OF SPENDING FOR AN AVERAGE PERSON



Percentages may not add to 100%, due to rounding.

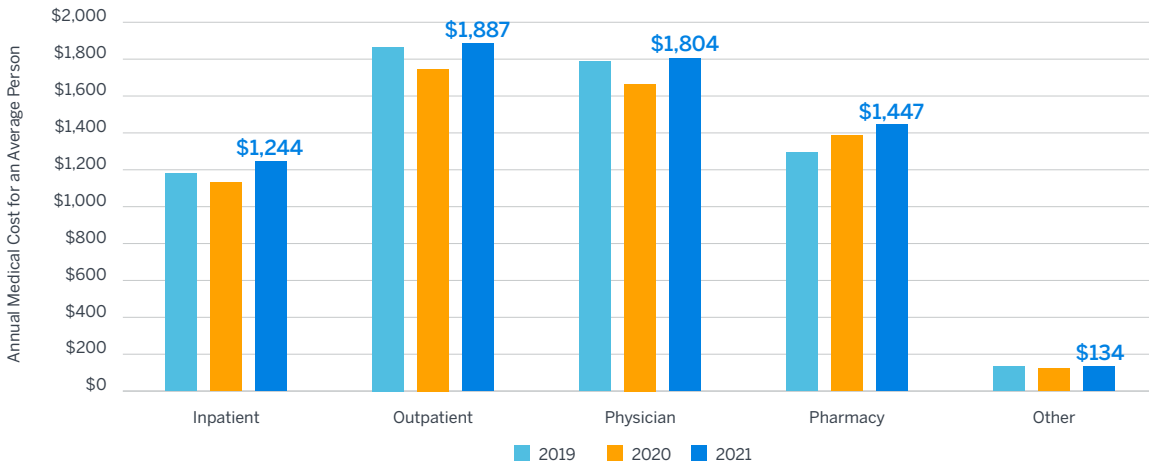
10 See https://www.milliman.com/-/media/milliman/pdfs/2021-articles/4-6-21-commercial-health-insurance.ashx, Figure 15, for more information.

Professional services are also a large category of healthcare costs, representing 28% of total healthcare spending for the average person in 2021. These costs 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, stand-alone lab or imaging center, or a physician office. Physician services were also significantly impacted by COVID-19 in 2020. Emerging data from 2020 suggests that physician costs were reduced by 6.8%, an even larger decrease than the hospital expense component. From 2020 to 2021, we are projecting physician cost to increase by 8.3%. Both the 2019 to 2020 and 2020 to 2021 physician trend rates are significant departures from the 2.3% trend rate observed from 2018 to 2019. Trend rates for physician expenses may differ materially between children and adults. Data published by the Commonwealth Fund indicated pediatric visits experienced the largest decrease in utilization from the beginning of the pandemic through the end of 2020.[11]

Deviating from COVID-19-influenced trends observed for both hospital and professional services, we are projecting that pharmacy costs for the average person will grow by 7.2% from 2019 to 2020, and by 4.3% from 2020 to 2021. As mail-order drug delivery surged at the onset of the pandemic, utilization reductions experienced by other components of care did not materialize for prescription drugs.[12]

The remaining 2% of expense is for "other" services, which include home healthcare, ambulance services, durable medical equipment (DME), and prosthetics. Similar to trend patterns for hospital and physician services, costs for these services declined by 6.8% from 2019 to 2020 but are estimated to increase by 8.1% from 2020 to 2021.

FIGURE 5: MMI ANNUAL SPENDING GROWTH BY COMPONENT OF CARE FOR AN AVERAGE PERSON



11 Mehrotra, A. ,et al. (February 22, 2021). The Impact of COVID-19 on Outpatient Visits in 2020: Visits Remained Stable, Despite a Late Surge in Cases. Commonwealth Fund. Retrieved May 19, 2021, from https://www.commonwealthfund.org/publications/2021/feb/impact-covid-19-outpatient-visits-2020-visits-stable-despite-late-surge.

12 Adams, K. (May 12, 2020). Mail-order drug delivery surges amid pandemic. Becker's Hospital Review. Retrieved May 19, 2021, from https://www.beckershospitalreview.com/pharmacy/mail-order-drug-delivery-surges-amid-pandemic.html.

Impact of prescription drug rebates

The MMI measures the total cost of healthcare benefits and excludes prescription drug rebates. When the MMI was first published in 2005, rebates were a much smaller amount relative to total healthcare costs. Health insurers report rebates and paid drug claims for fully insured business. In 2020, rebates represented 23.4% of paid drug claims, up from 10.2% in 2013.[13]

Rebate agreements between drug manufacturers and pharmacy benefit managers (PBMs) are treated as proprietary information. We project that rebates are approximately 20% to 25% of allowed drug costs in 2021. We estimate that the 2021 MMI for an average person would decrease by about 5% if rebates in this range are shared with employers. Figure 6 illustrates the impact of rebates on the 2021 MMI for the average person.

FIGURE 6: IMPACT OF ILLUSTRATIVE REBATES ON MMI

CATEGORY	2021 MMI AVERAGE PERSON AMOUNT	NET OF ILLUSTRATIVE REBATES
MEDICAL	$5,069	$5,069
PHARMACY	$1,447	$1,124
TOTAL	**$6,516**	**$6,193**

Drug rebates are generally paid by pharmaceutical manufacturers to PBMs for preferred formulary placement. PBMs often share a portion of rebates with the health plan and employer clients.[14] In most employer-sponsored PPO plans today, rebates do not affect employee's out-of-pocket costs. Rebates shared with employers may be used to reduce the cost of healthcare benefits.

Employees' share of healthcare costs

In the employer group insurance market, the total cost of healthcare is shared by employers and employees. To clearly define each payment source, we use three main categories:

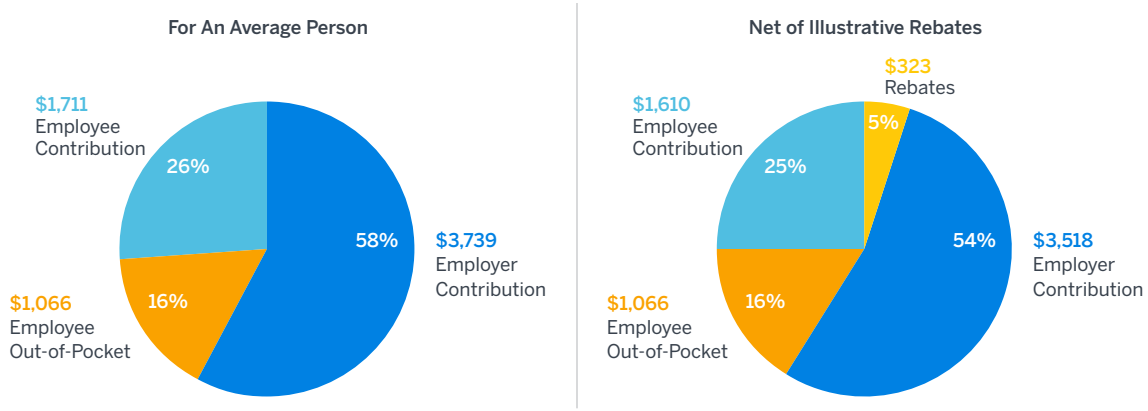
1. **Employer contribution.** Employers that sponsor health plans subsidize the cost of healthcare for their employees by allocating compensation dollars to pay a large share of the cost. The portion paid by the employer varies according to the benefit plan option the employee selects.
2. **Employee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

13 Based on analysis of Supplemental Healthcare Exhibit data published by statutory health insurance entities.

14 Alston, M., Dieguez, G., & Tomicki, S. (May 21, 2018). A primer on prescription drug rebates: Insights into why rebates are a target for reducing prices. Milliman Insight. Retrieved May 19, 2021, from https://www.milliman.com/en/insight/a-primer-on-prescription-drug-rebates-insights-into-why-rebates-are-a-target-for-reducing.

Figure 7 shows the relative proportions of the three categories. We project that employers will subsidize their employees' healthcare costs by paying an average of 58% of the total cost in 2021. Of the $6,516 total cost for an average person, the employer pays about $3,739 while the employee pays the remaining $2,777, which is a combination of $1,711 in employee payroll deductions and $1,066 in out-of-pocket costs paid when utilizing healthcare services. Figure 7 also illustrates the impact of pharmacy rebates on employer and employee contributions described in the prior section.

FIGURE 7: RELATIVE PROPORTIONS OF 2021 MEDICAL COSTS



Employees paid 1.2% more per person in 2020 than they did in 2019 while employers paid 6.7% less, largely due to self-funded employers incurring lower claims costs due to the pandemic.[15] We predict employee costs will increase 2.8% in 2021 while employer costs will increase 11.6%. Employee paycheck deductions are expected to be flat versus 2020 while employee out-of-pocket costs will increase more significantly with less deferred care this year. Likewise, employers will see their costs rise more significantly than the employee contributions as utilization of healthcare returns to a more "normal" state this year.

Figure 8 compares the employer and employee spend breakdown for an average person as well as the MMI family of four. While the distribution of costs is similar, we can see that the family of four shares 27% of the cost via employee contributions while the average person shares 26.3%. This is a common situation, as employers tend to require employees to pay more toward the coverage of dependents.

FIGURE 8: EMPLOYER AND EMPLOYEE PORTIONS OF SPENDING FOR AVERAGE PERSON AND MMI FAMILY OF FOUR

	AVERAGE PERSON	MMI FAMILY OF FOUR
EMPLOYER CONTRIBUTION	$3,739	$16,007
EMPLOYEE PORTION		
EMPLOYEE CONTRIBUTION	$1,711	$7,629
EMPLOYEE OUT-OF-POCKET	$1,066	$4,620
EMPLOYEE TOTAL	**$2,777**	**$12,249**

15 Employers paying fully insured premiums may not have had a reduced 2020 contribution because their premiums were established prior to the onset of the pandemic.

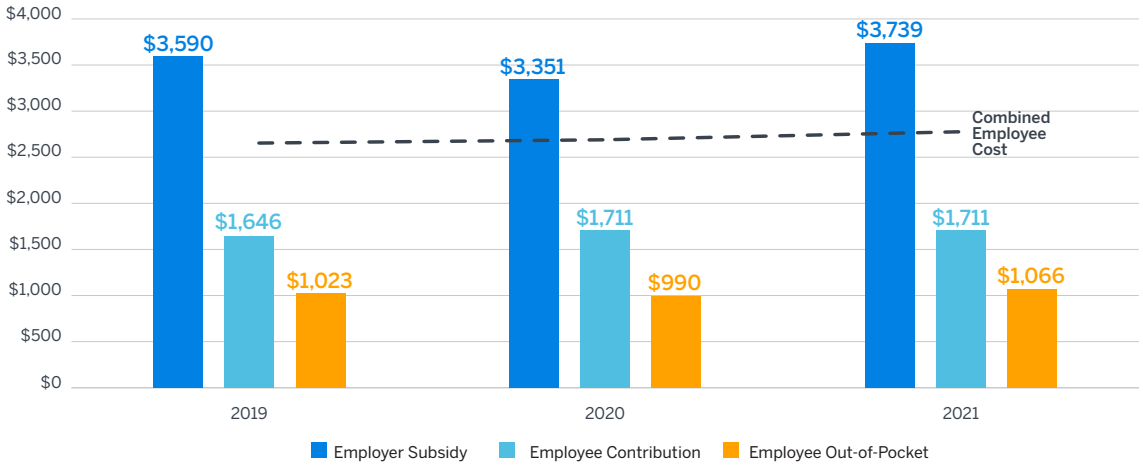
Figure 9 provides additional information on how cost sharing has evolved over time. In 2019, our data indicated that 16.3% of all costs, or $1,023, were paid at the point of service by an average person. We assume that employers will maintain a similar plan in 2020 and 2021 that continues to result in a similar percentage of point-of-service employee payments, or an actuarial value of about 84%. Due to healthcare cost growth, this translates to a projected 2021 employee out-of-pocket cost of $1,066.

Employee contributions were $1,646 per person in 2019 and increased to $1,711 in 2020. Based on early indicators, we project 2021 contributions of $1,711 per average person, in part to reflect the lower healthcare costs employers incurred in 2020.

The employer subsidy decreased from $3,590 in 2019 to $3,351 in 2020 largely because of the reductions in costs due to COVID-19. We project the employer subsidy will rebound this year to $3,739 in 2021.

From 2019 to 2021, we predict employees will see a cumulative 4.0% increase in their total average costs (employee contributions, plus out-of-pocket expenses incurred at point of care). In the same time period, we predict employers will see a 4.2% bump in their portions of employee benefit costs.

FIGURE 9: MEDICAL COST BY SOURCE OF PAYMENT FOR AN AVERAGE PERSON



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 portrays the projected total cost of medical care for an average person, and for a hypothetical family of four (two adults and two children), covered under an average 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
- Utilization levels representative of the average for people covered by large employer group health benefit plans in the United States

The Patient Protection and Affordable Care Act (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, or 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 83.6% in 2021.

VARIATION IN COSTS

While the MMI measures costs for an average person, and for a hypothetical 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 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.

THE MMI DIFFERS FROM SOME OTHER TYPES OF INDICES

The MMI dollar amounts are best estimates of annual healthcare costs, estimates that can and will be restated over time as new information becomes available. The dollar amounts are grounded in actual health insurance claims incurred over multiple years. The most recent year of data reflects approximately 65 million lives. However, the published MMI dollar amounts for the most recent two years are estimates, using actual claims data that is trended forward to the most recent two years. For example, dollar amounts published in the 2021 report were grounded in 2019 claims, and then projected forward from 2019 to 2020 and 2021 using estimated trend rates. The trend rates are estimated after considering a variety of industry data sources and other information, including the impact of the COVID-19 public health emergency. Some degree of judgment is applied when integrating the most recent data points into single best estimates of nationwide average trend rates for each major type of service. Further, we intend to routinely restate past published numbers as new information becomes available. For example, in the 2021 MMI report, we have restated the 2019 and 2020 numbers that were published in last year's report. As such, we view the MMI numbers as continually restated best estimates of costs.

Some MMI readers have asked whether it is reasonable to reference the MMI in performance guarantee contracts. To illustrate, contracts between health plans and very large employers sometimes require financial settlements between the two parties when, for example, the employer's actual healthcare costs grow by more or less than a specified benchmark. The MMI is not the optimal benchmark for such purposes, as it is based—at least in part—on estimates and professional judgment, as described above. In our opinion, a contractual trend guarantee should be based on an index that is a purely objective reflection of actual trends from a large, stable, and highly credible data source that is not prone to influence from judgment. Milliman has a resource that was developed specifically for that purpose, the Milliman Health Trend Guidelines (HTGs). The HTGs are a series of indices providing per capita data on the cost, utilization, and unit costs of healthcare services. Formerly known as the S&P Healthcare Claims Indices, Milliman collaborated with S&P on the indices since their inception, before acquiring them in January 2019. The HTGs provide purely objective, data-driven, backward-looking indices of actual healthcare trends by geographic area, line of business, and type of service. They were developed with the intention of being reliable indices for contractual performance guarantees. Data underlying the HTGs are also used to help inform Milliman's Health Cost Index Forecast (HCIF). The HCIF is a forward-looking three-year projection of healthcare trends.

Milliman

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.

milliman.com

CONTACT

Paul Houchens
paul.houchens@milliman.com

Dave Liner
dave.liner@milliman.com

Annie Man
annie.man@milliman.com

Andrew Naugle
andrew.naugle@milliman.com

Doug Norris
doug.norris@milliman.com

Scott Weltz
scott.weltz@milliman.com