October 2018

On the Rise

Out-of-Pocket Healthcare Spending in 2017

JPMorgan Chase & Co.
INSTITUTE

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Contact

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On the Rise:

Out-of-Pocket Healthcare Spending in 2017

Diana Farrell
Fiona Greig

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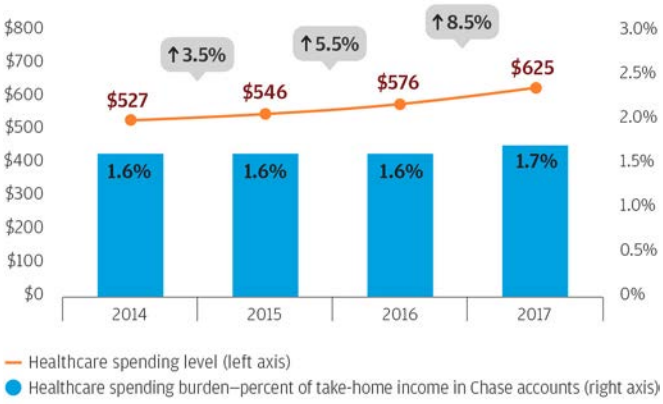
Executive Summary

Leveraging financial transaction data, the JPMorgan Chase Institute provides a unique cash flow view of families' healthcare out-of-pocket spending and financial burden. In 2017 we released the first estimates of out-of-pocket healthcare spending levels and burden at the state and county level from 2013 to 2016, from our JPMorgan Chase Institute Healthcare Out-of-pocket Spending Panel (JPMCI HOSP) data asset. In this brief, we describe enhancements to, and key findings from, the updated JPMCI HOSP data asset that includes the first available estimates of 2017 healthcare out-of-pocket spending trends, as well as a first-ever look at year-over-year trends at the state and county level and for different demographic groups.

Our key findings are:

1. Year-over-year growth in out-of-pocket healthcare spending levels accelerated since 2014 to 8.5 percent in 2017. The burden of healthcare spending as a percent of take-home income ticked up slightly.
2. In 2017 high-income families experienced the fastest growth in healthcare spending, while low-income families experienced the highest growth in healthcare spending burden.
3. In 2017 families in Utah spent the most on and were the most burdened by out-of-pocket healthcare spending, while families in California saw the highest growth in spending levels.
4. Out-of-pocket healthcare spending grew the most at hospitals and 'other medical services, equipment, and labs' and decreased at drug stores for the third consecutive year.

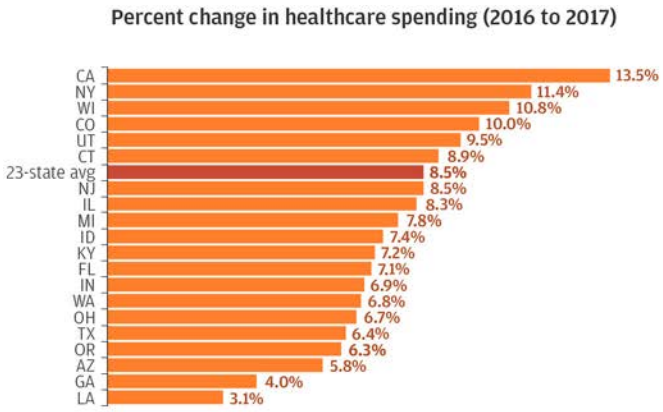
Average annual out-of-pocket healthcare spending level grew the fastest in 2017, while healthcare spending burden ticked up slightly.

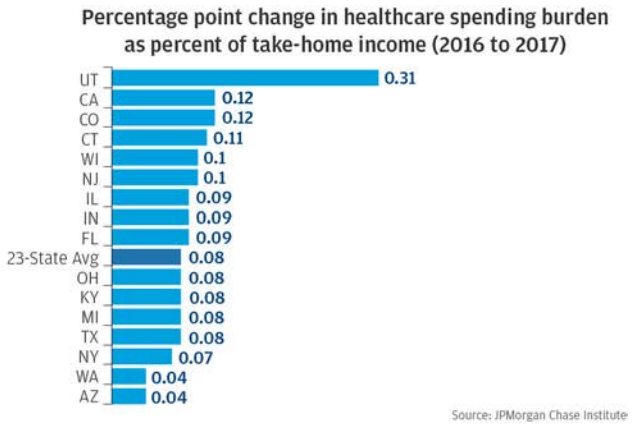


Source: JPMorgan Chase Institute

In conclusion, for three consecutive years, out-of-pocket healthcare spending has accelerated. We observed positive growth across every state and demographic group. For the first time in three years, we observed an uptick in healthcare spending burden as a percent of take-home income. The increase in burden occurred across demographic groups, but was largest among families in the lowest income quintiles and families living in Utah. Families in California experienced the highest growth in healthcare spending levels. At the county-level, the coastal region of California showed especially high growth in spending. It is important that we continue to monitor levels and trends in out-of-pocket healthcare costs borne by families, as we seek to do with the JPMCI HOSP data asset, because they affect people's choices regarding whether and when to consume care.

From 2016 to 2017, healthcare spending grew the most in California and healthcare spending burden grew the most in Utah.





Source: JPMorgan Chase Institute

Introduction

With the growth of high deductible plans, families are at risk of incurring higher out-of-pocket healthcare costs (Kaiser Family Foundation, 2017). The JPMorgan Chase Institute set out to understand families' out-of-pocket healthcare expenditures and the financial burden they imposed on families over time. It is important to track out-of-pocket healthcare spending trends because healthcare spending is intricately linked to families' cash flows. As we have previously demonstrated, account holders increase their out-of-pocket healthcare spending by 60 percent in the week after receiving a tax refund, and the majority of the increase goes towards in-the-moment, in-person care (Farrell, Greig and Hamoudi, 2018). In other words, cash flow dynamics affect not just when people pay for healthcare but also when they consume it. Leveraging financial transaction data, we are able to provide a uniquely granular view of families' out-of-pocket spending levels and burden at the state and county level and as recent as 2017. We found positive growth in healthcare spending across every state and demographic group and an acceleration since 2014.

In 2017 we released estimates of out-of-pocket healthcare spending levels and burden from our JPMCI HOSP data asset from 2013 to 2016. In this brief we describe enhancements to, and key findings from, the updated HOSP data asset that include our latest estimates of 2017 healthcare out-of-pocket spending trends, as well as a first-ever look at year-over-year trends at the state and county level and for different demographic groups.

From a universe of 37 million families with Chase checking accounts, we assembled a sample of regular Chase customers who reside in the 23 states with a Chase branch footprint and for whom we have good insight into their financial lives. As we describe in the Data Asset section, our unit of analysis is the primary account holder, whom we subsequently refer to as a family. Also, given our sample size, our estimates generally have very small standard errors. However, since Chase Bank has different levels of geographic coverage across states, our sample sizes are not distributed evenly. As a result, estimates for some states have larger standard errors than others. Hence, for state-level and county-level estimates of means and ratios, we follow a precision guideline where we report estimates with relative standard errors (standard error/estimate) less than 30 percent without caution. More details on our precision guideline can be found in the Data Asset section.

As we detailed in our previous report, "Paying Out-of-Pocket: The Healthcare Spending of 2 Million US Families," the JPMCI HOSP data asset offers a lower bound estimate of out-of-pocket healthcare spending (Farrell and Greig, 2017). It excludes insurance-related costs such as premiums, which are often deducted directly from an employee's paychecks, but includes out-of-pocket payments that might be subsequently reimbursed by insurance.[1] In this sense, JPMCI HOSP provides a cash flow view of families' out-of-pocket healthcare spending.

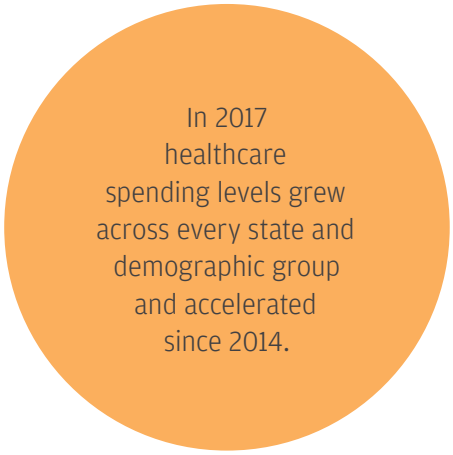
Our key findings are:

1. Year-over-year growth in out-of-pocket healthcare spending levels accelerated since 2014 to 8.5 percent in 2017. The burden of healthcare spending as a percent of take-home income ticked up slightly.

2. In 2017 high-income families experienced the fastest growth in healthcare spending, while low-income families experienced the highest growth in healthcare spending burden.

3. In 2017 families in Utah spent the most on and were the most burdened by out-of-pocket healthcare spending, while families in California saw the highest growth in spending levels.

4. Out-of-pocket healthcare spending grew the most at hospitals and 'other medical services, equipment, and labs' and decreased at drug stores for the third consecutive year.



Findings

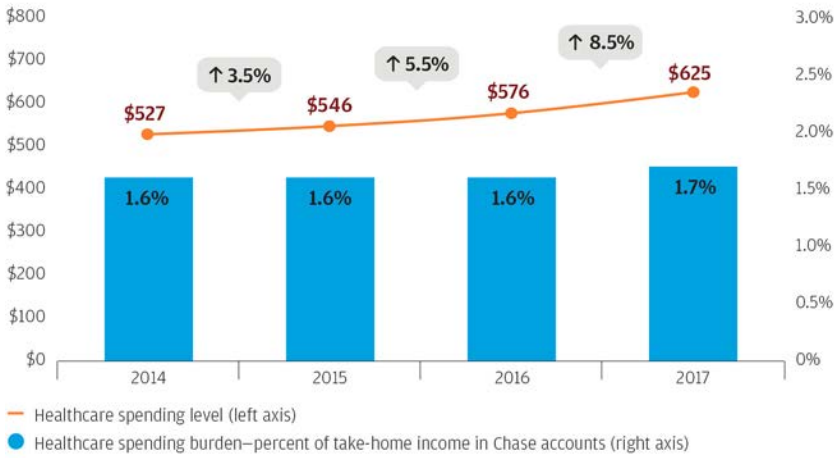
Finding One

Year-over-year growth in out-of-pocket healthcare spending levels accelerated since 2014 to 8.5 percent in 2017. The burden of healthcare spending as a percent of take-home income ticked up slightly.

From the JPMCI HOSP data asset, we estimated that 2017 out-of-pocket healthcare spending was $625 on average, a lower bound estimate.[1] From 2014 to 2017, out-of-pocket healthcare spending grew by an average annual rate of 5.8 percent from $527 in 2014 to $625 to 2017, with 2017 exhibiting a year-over-year growth rate of 8.5 percent, the fastest over the last three years (Exhibit 1). The financial burden of out-of-pocket healthcare spending as a fraction of take-home income was stable between 2014 and 2016, hovering around 1.6 percent, but ticked up to 1.7 percent in 2017.

Exhibit 1

Average annual out-of-pocket healthcare spending level grew the fastest in 2017, while healthcare spending burden ticked up slightly.



Source: JPMorgan Chase Institute

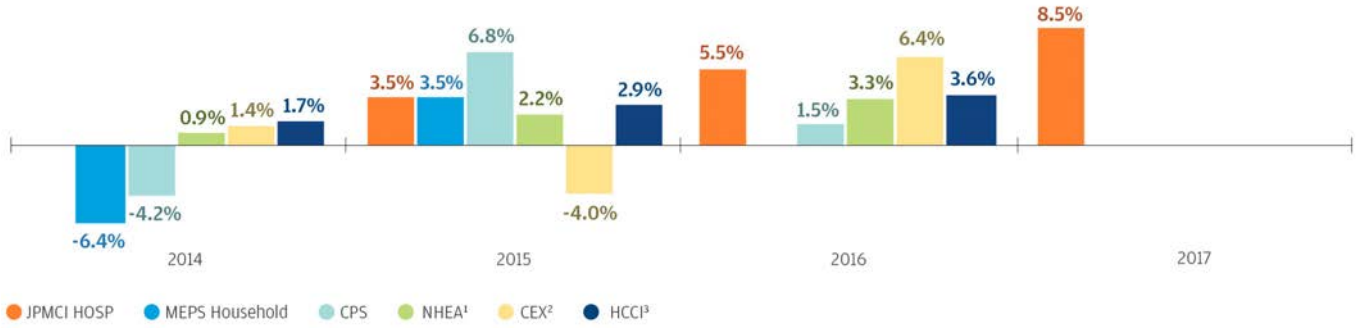
JPMCI HOSP is the first available glimpse into 2017 out-of-pocket healthcare spending. JPMCI HOSP data show that out-of-pocket healthcare spending grew by 8.5 percent in 2017, accelerating from the prior two years.

In Exhibit 2, we compare the annual growth rates of our estimates based on the latest 2017 data with available national benchmarks.[2] The annual growth rates of out-of-pocket healthcare spending vary widely across different national statistics. In 2015, for example, the year-over-year growth in the average spending level ranges from -4.0 percent according to Consumer Expenditure Survey (CEX) to 6.8 percent in the Current Population Survey (CPS). In addition, while the National Health Expenditure Accounts (NHEA), the Health Care Cost Institute (HCCI), and JPMCI HOSP show consistent positive growth in out-of-pocket healthcare spending each year, the Medical Expenditure Panel Survey (MEPS), CPS, and CEX estimate a decline in healthcare spending in at least one year.[3] Part of this wide variation in growth rate estimates could be due to differences in target populations included in these surveys. For example, data provided by the Healthcare Cost Institute (HCCI) only includes those age 0-64 covered by employer-sponsored insurance plans. Notwithstanding the differences in target populations, the growth ranges were still stark.

Across these sources, JPMCI HOSP is the first available glimpse into 2017 out-of-pocket healthcare spending. JPMCI HOSP data show that out-of-pocket healthcare spending grew by 8.5 percent in 2017, accelerating from the prior two years.

Exhibit 2

National benchmarks show wide variations in estimates of year-over-year out-of-pocket healthcare spending growth.



[1] NHEA data reflect growth in per capita out-of-pocket healthcare spending by dividing total out-of-pocket spending by population. Includes population of all ages.
[2] Includes population of all ages.
[3] Includes population age 0-64 covered by employer-sponsored insurance.

Source: JPMorgan Chase Institute

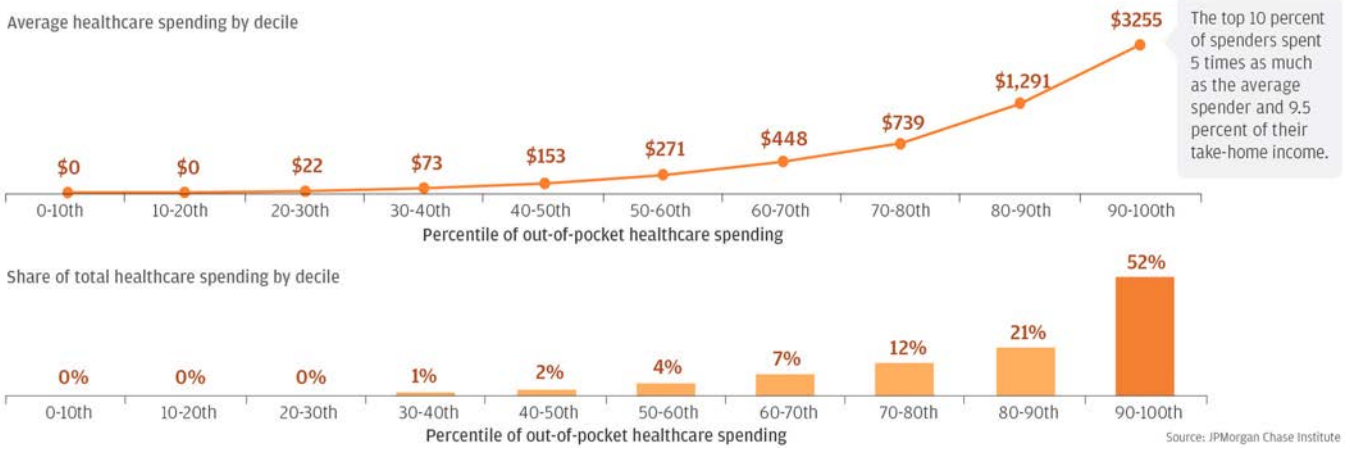
The accelerated growth in out-of-pocket healthcare spending could be driven by factors such as changes in prices, utilization, and increasing prevalence of high-deductible plans that require more cost-sharing from consumers. The Consumer Price Index for urban consumers' medical care grew by 2.4 percent in 2014, 2.6 percent in 2015, 3.8 percent in 2016, and 2.5 percent in 2017, suggesting an increase in healthcare prices that would not fully account for the growth in out-of-pocket healthcare spending observed in JPMCI HOSP and some other sources (U.S. Bureau of Labor Statistics, 2018). An annual survey of health insurance plans found that overall cost sharing has increased through an increase in deductibles, higher enrollment in high-deductible health insurance plans, and also higher enrollment in plans with an out-of-pocket maximum above $6,000 (Kaiser Family Foundation, 2017). It is important to note that we cannot make any conclusions regarding the implications of growing out-of-pocket spending for health outcomes since JPMCI HOSP only measures the cash flow picture of healthcare spending, and we do not observe healthcare outcomes.

Out-of-pocket healthcare spending is highly concentrated among a small fraction of the population. In 2017 the top 10 percent of spenders spent on average $3,255, which is five times as much as the average spender and represents 9.5 percent of their take-home income (Exhibit 3). These top 10 percent of spenders accounted for 52 percent of total out-of-pocket healthcare spending we observed in 2017. In fact, out of the 8.5 percent growth in average spending levels we observed from 2016 to 2017, these top 10 percent of spenders contributed almost half (48 percent) of the total growth (Exhibit 4).

Out of the 8.5 percent growth in average spending levels we observed in 2017, the top 10 percent of spenders contributed almost half (48 percent) of the total growth.

Exhibit 3

In 2017 the top 10 percent of spenders spent five times as much as the average spender and accounted for 52 percent of total out-of-pocket healthcare spending.



Source: JPMorgan Chase Institute

Exhibit 4

The top 10 percent of spenders contributed to 48 percent of the growth in aggregate average healthcare spending from 2016 to 2017.

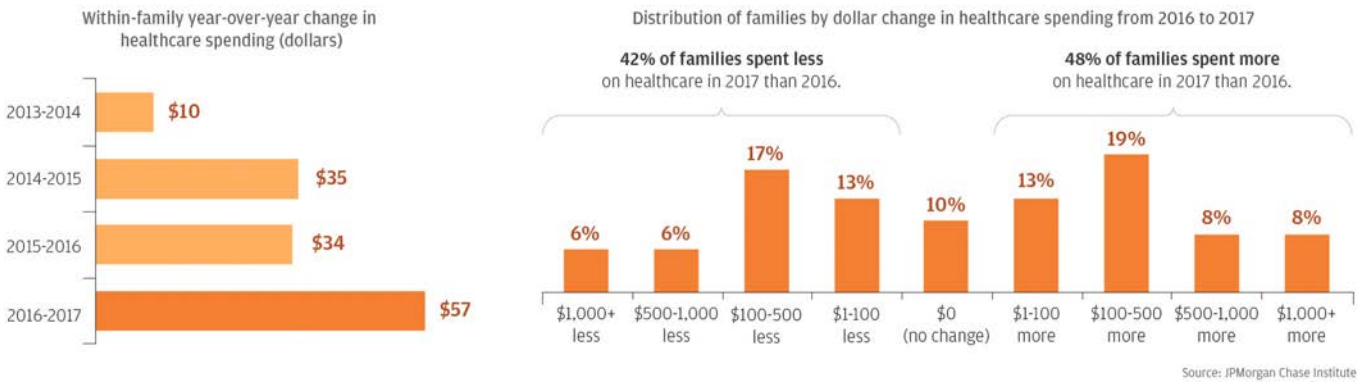
Percentile of out-of-pocket healthcare spending	Contribution to aggregate growth in average healthcare spending by decile (2016-2017)	Year-over-year growth in average healthcare spending by decile (2016-2017)
0-10th	0%	0%
10-20th	0%	0%
20-30th	1%	15%
30-40th	2%	14%
40-50th	3%	11%
50-60th	5%	10%
60-70th	8%	9%
70-80th	13%	9%
80-90th	21%	9%
90-100th	48%	8%

Source: JPMorgan Chase Institute

Thus far, we have examined year-over-year growth in healthcare spending at the aggregate level and by decile of healthcare spending, meaning that we compared across each year average spending among all families in our sample. We also looked at within-family year-over-year change in out-of-pocket healthcare spending in dollars. Over the last four years, within-family year-over-year dollar change was the highest in 2017, rising from an average of $10 change from 2013 to 2014 to $57 change from 2016 to 2017.[4] From 2016 to 2017, 10 percent of families observed no change in their healthcare spending, 42 percent of families spent less than the year before, and 48 percent of families spent more than the year before. Notably, 8 percent of families spent $1,000 more than what they spent last year (Exhibit 5).

Exhibit 5

2017 showed the highest within-family year-over-year dollar change in out-of-pocket healthcare spending, with 48 percent of families spending more than last year.

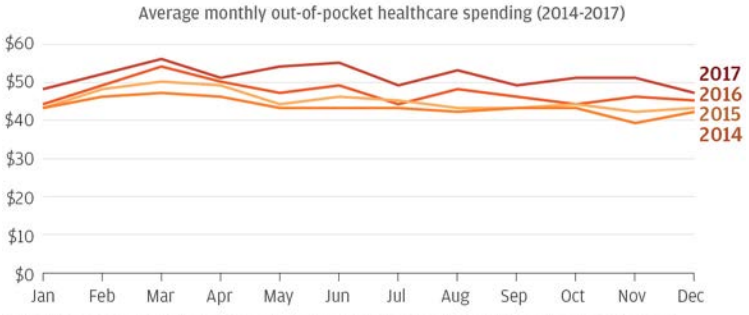


Source: JPMorgan Chase Institute

The high-frequency nature of our data allows us to also look at monthly trends. Out-of-pocket healthcare spending is concentrated within a few months of the year. Typically, families spent on healthcare in just three months out of the year with a median month-to-month percent change of 140 percent and dollar change of $61 (Farrell and Greig, 2017). March is consistently the month with the highest spending (Exhibit 6). In our report, "Deferred care: how tax refunds enable healthcare spending," we demonstrated that tax refunds—the single largest cash infusion of the year for many families and that often arrives in February or March—results in a spike in healthcare payments (Farrell, Greig and Hamoudi, 2018).

Exhibit 6

March is consistently the highest spending month because of cash flow dynamics related to timing of tax refund arrivals.



Note: The average month spending values are normalized by the number of days in each month.

Source: JPMorgan Chase Institute

Finding **Two**

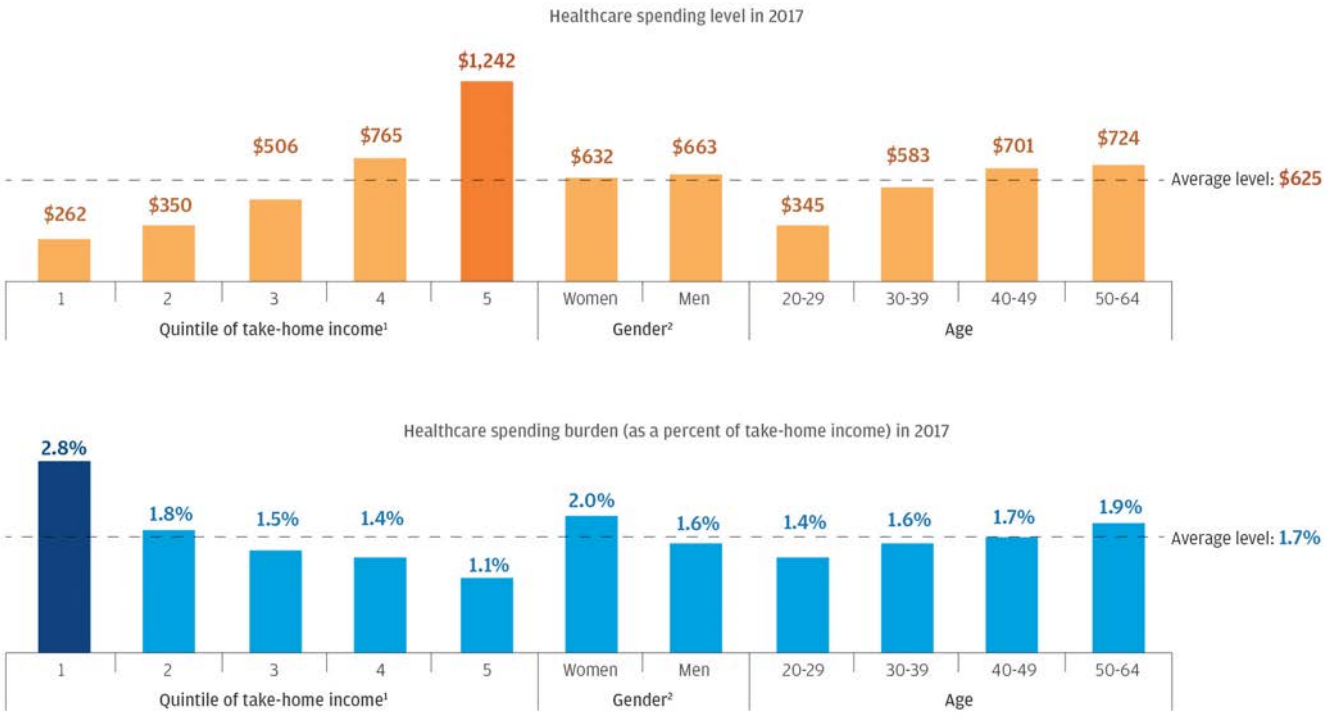
In 2017 high-income families experienced the fastest growth in healthcare spending, while low-income families experienced the highest growth in healthcare spending burden.

Healthcare spending was almost double the 23-state average among families in the top quintile of take-home income ($1,242 compared to $625).[5] Older account holders also had higher spending than the 23-state average. In terms of burden, families in the lowest quintile of take-home income spent a higher percent of their take-home income on healthcare (2.8 percent) compared to the 23-state average (1.7 percent). Older and female account holders also had higher than average spending burden (Exhibit 7).[6] We provide the cross-tab of age and income groups for both spending levels and burden in Exhibit 20 of the Appendix. The trends of higher income groups having higher healthcare spending and lower healthcare spending burden holds true when we looked at account holders in the same age bin, albeit less stark.

In 2017 families in the top income quintile spent almost double the 23-state average and also experienced the largest percent increase in healthcare spending.

Exhibit 7

High-income families had the highest levels of healthcare spending while low-income families had the highest levels of healthcare spending burden in 2017.



¹ Ranges of take-home income quintiles in 2017: Quintile 1 (<$14K), Quintile 2 ($14K - $25K), Quintile 3 ($25K - $42K), Quintile 4 ($42K - $72K), and Quintile 5 (>$72K).

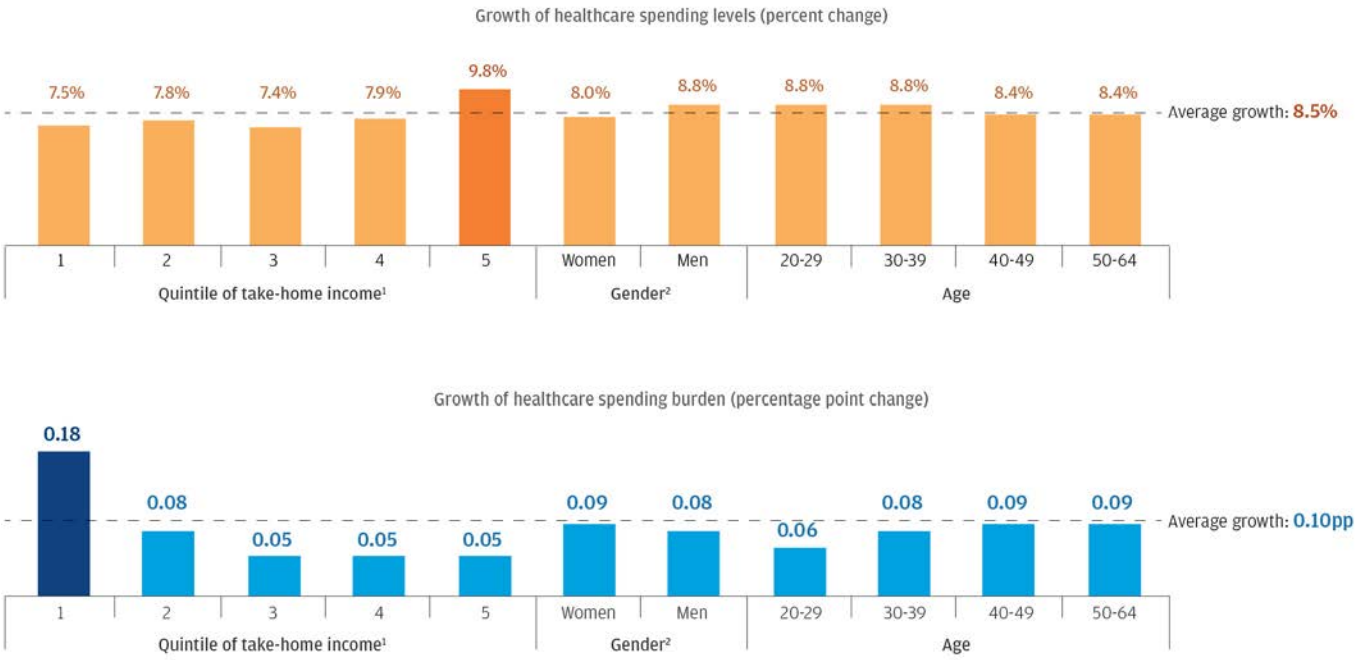
² We report statistics by the gender of the primary account holder for the roughly 80 percent of account holders for whom gender could be inferred.

Source: JPMorgan Chase Institute

From 2016 to 2017, growth for healthcare spending for high-income families (9.8 percent) exceeded the 23-state average of 8.5 percent. While the average healthcare spending burden had remained relatively stable from 2016 and 2017, growing by 0.08 percentage points, low-income families' out-of-pocket healthcare spending burden grew by 0.18 percentage points (Exhibit 8).

Exhibit 8

Healthcare spending levels grew the fastest among high-income families while healthcare spending burden grew the fastest among low-income families from 2016 to 2017.



[1] Ranges of take-home income quintiles in 2016: Quintile 1 (<$14K), Quintile 2 ($14K - $24K), Quintile 3 ($24K - $41K), Quintile 4 ($41K - $69K), and Quintile 5 (>$69K). Ranges of take-home income quintiles in 2017: Quintile 1 (<$14K), Quintile 2 ($14K - $25K), Quintile 3 ($25K - $42K), Quintile 4 ($42K - $72K), and Quintile 5 (>$72K).

[2] We report statistics by the gender of the primary account holder for the roughly 80 percent of account holders for whom gender could be inferred.

Source: JPMorgan Chase Institute

While the average healthcare spending burden had remained relatively stable from 2016 to 2017, growing by 0.08 percentage points, low-income families' out-of-pocket healthcare spending burden grew by 0.18 percentage points.

Finding Three

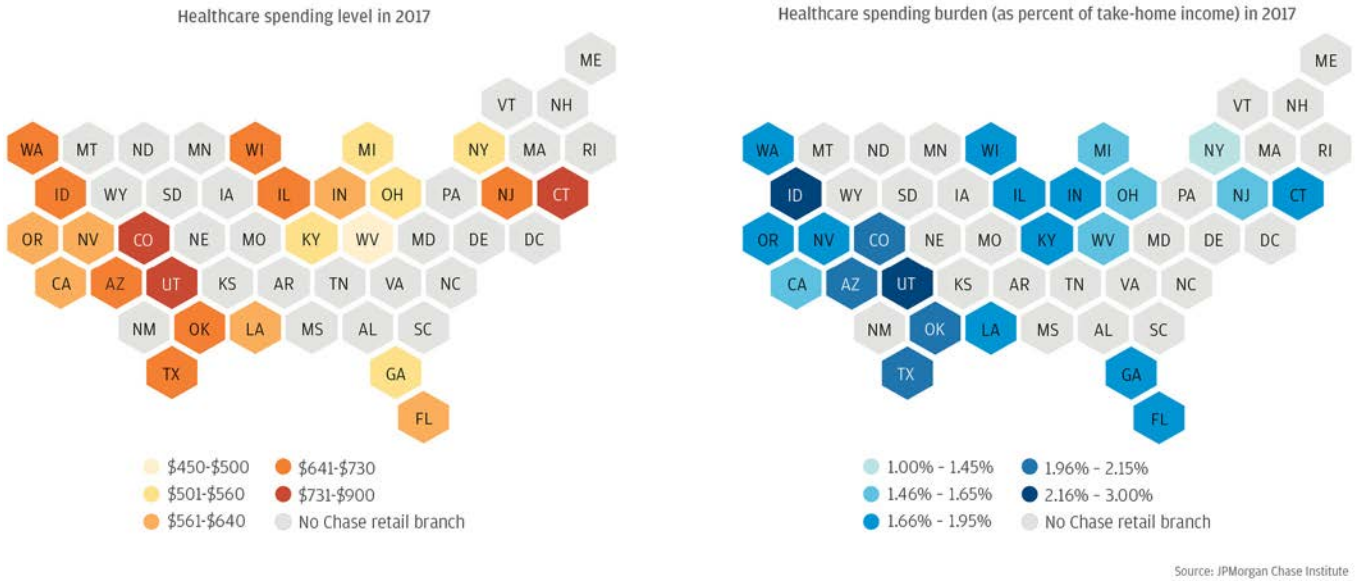
In 2017 families in Utah spent the most on and were the most burdened by out-of-pocket healthcare spending, while families in California experienced the highest growth in spending levels.

As documented in our first release of JPMCI HOSP data asset, we continue to observe high variation in out-of-pocket healthcare spending and burden levels across states (Exhibit 9) (Farrell and Greig, 2017). In 2017 the average out-of-pocket healthcare spending level was highest among families in Utah ($864) and Colorado ($797) and lowest among families in West Virginia ($495) and Kentucky ($540) among our 23 states—a nearly two-fold difference between Utah and West Virginia. In terms of healthcare spending burden, families in Utah (2.8 percent) and Idaho (2.4 percent) were the most burdened, in contrast with families in New York (1.4 percent) and Ohio (1.5 percent), who were the least burdened. The maps in Exhibit 9 shed light on regional patterns of out-of-pocket healthcare spending. We observed high spending and burden in the Mountain States, such as Utah, Colorado, and Idaho, and also in Connecticut and New Jersey on the East Coast.

Utah stood out not only for high levels of healthcare spending and burden but also high growth in healthcare spending burden in 2017.

Exhibit 9

There is wide variation in out-of-pocket healthcare spending and burden levels across states.



Source: JPMorgan Chase Institute

By looking at state-specific spending levels and burden across the last four years (Exhibits 10 and 11), we reveal other stark trends at the state level. Utah stood out not only for high levels of healthcare spending and burden but also high growth in healthcare spending burden in 2017. California and New York started at similar levels of spending in 2014, but California experienced faster growth in healthcare spending over the past four years.[7]

Exhibit 10

Families in Utah spent the most on healthcare in 2017.

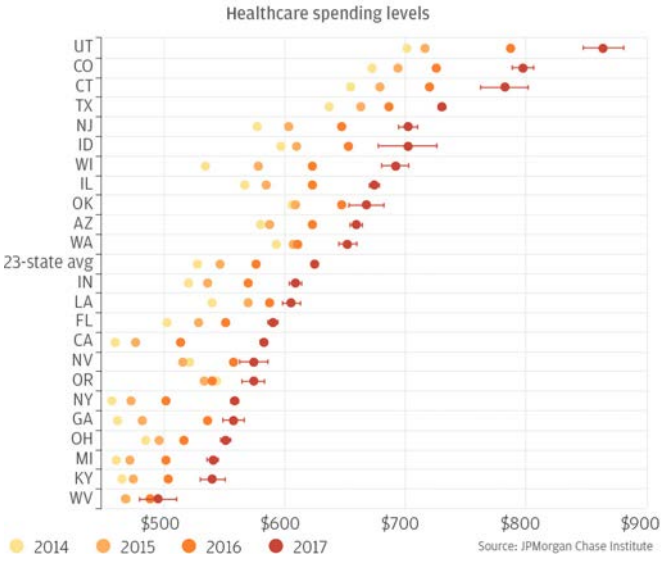
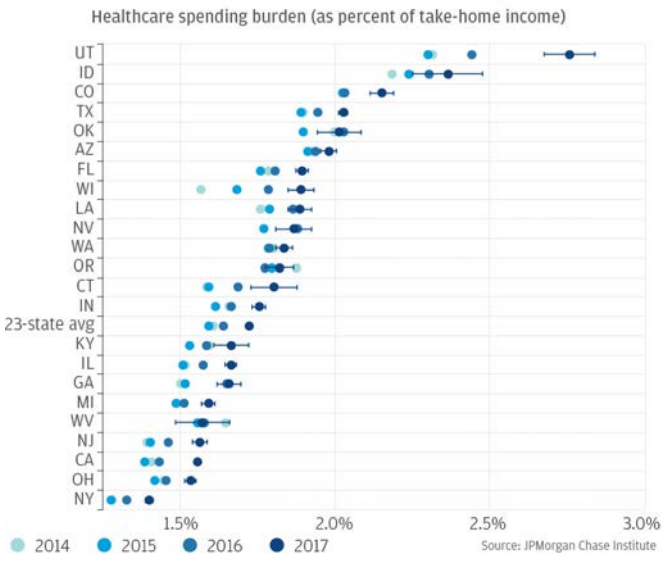


Exhibit 11

Families in Utah were also the most burdened by healthcare in 2017.

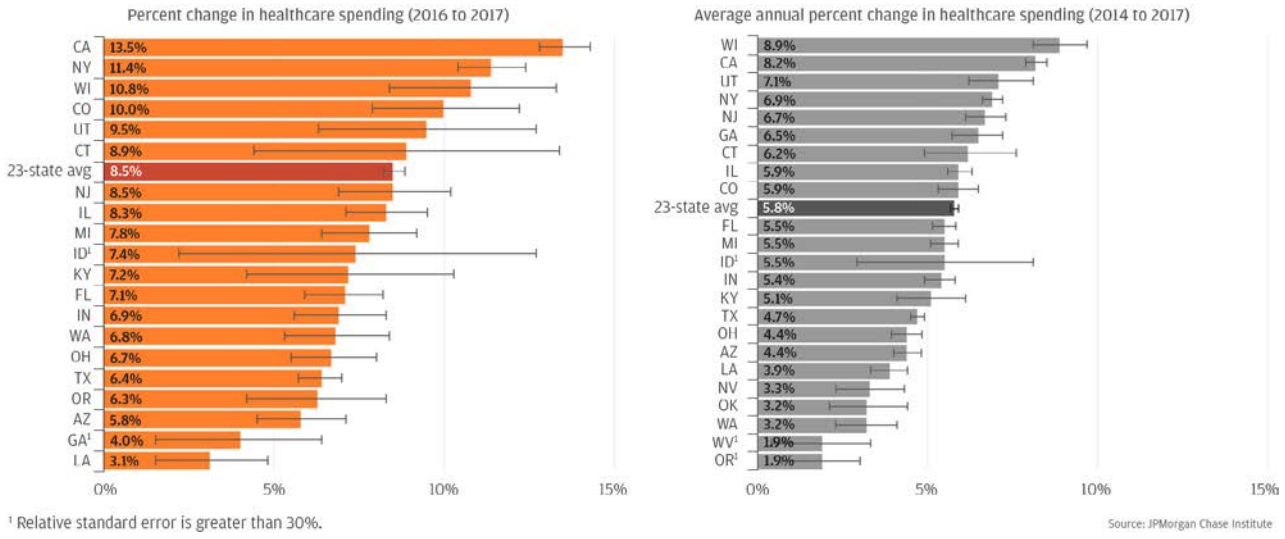


Exhibits 12 and 13 display annual growth in healthcare spending and burden levels in 2017 and between 2014 and 2017 for states within the bounds of our reporting precision guidelines (less than a 50 percent relative standard error), detailed in the Data Asset section. California showed the fastest growth in spending levels (13.5 percent) from 2016 to 2017. Other high-growth states include New York (11.4 percent), Wisconsin (10.8 percent), and Colorado (10.0 percent). These states are noteworthy for the growth in healthcare spending not just in 2017 but also on average since 2014. Over a four-year time frame, California's average year-over-year growth rate remained high (8.2 percent), along with Wisconsin (8.9 percent), Utah (7.1 percent), and New York (6.9 percent), compared to a 23-state average of 5.8 percent. Utah, the state with the highest levels of healthcare spending in 2017, was also among the states with the highest growth rates over the four-year period.

At the low end, Louisiana exhibited the slowest growth in healthcare spending in 2017 at just 3.1 percent, compared to the 23-state average of 8.5 percent. Over the last four years, Washington's average annual growth rate was 3.2 percent from 2014 to 2017, the slowest among states with relative standard error less than 30 percent (Exhibit 12).

Exhibit 12

California had the highest growth in healthcare spending from 2016 – 2017.

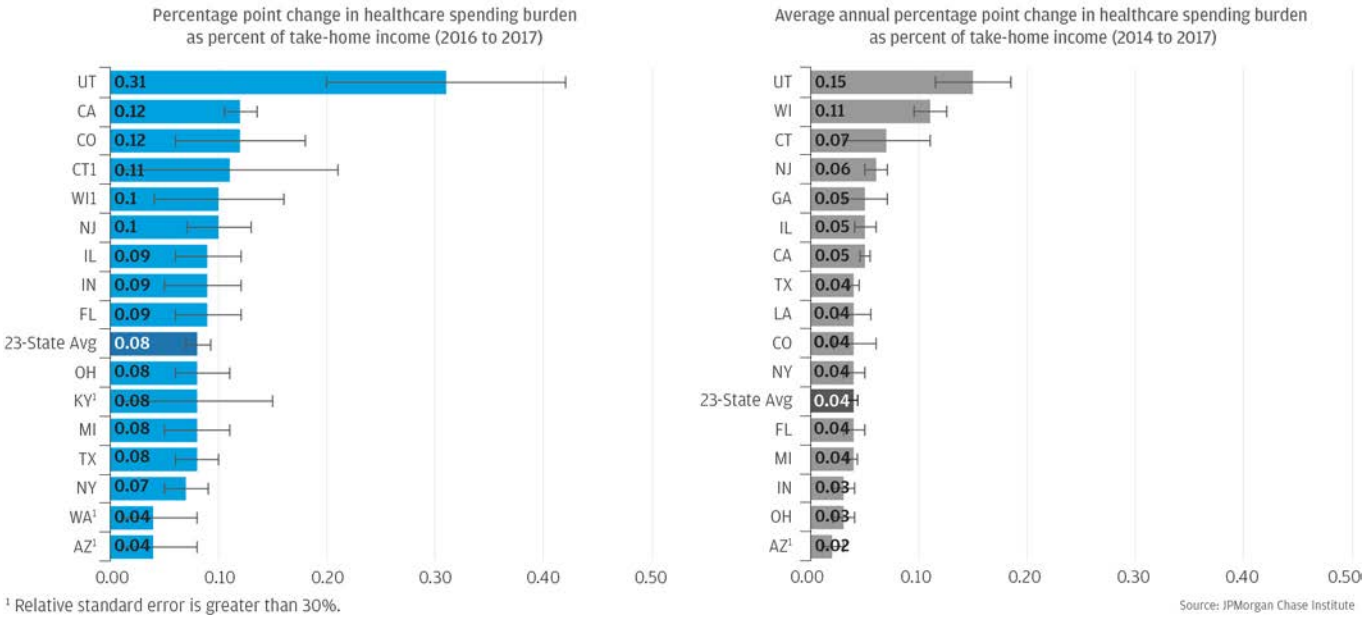


[1] Relative standard error is greater than 30%.

In terms of growth of healthcare spending burden, Utah stands out among all 23 states with the fastest growth in burden. From 2016 to 2017, Utah's average healthcare spending burden increased by 0.31 percentage points to 2.8 percent of annual take-home income, making Utah the state most burdened by out-of-pocket healthcare spending.[8] Over a longer four-year time frame, Utah's healthcare spending burden increased by 0.15 percentage points per year on average and was the fastest growing among all 23 states (Exhibit 13).

Exhibit 13

Healthcare spending burden grew the most in Utah by 0.31 percentage points from 2016 to 2017.



[1] Relative standard error is greater than 30%.

Source: JPMorgan Chase Institute

Next we zoom into within-state trends for Utah and California. In Utah we explore what accounts for the high levels of healthcare spending and burden. For California we explore what accounts for the high spending growth in 2017.

Utah's comparatively high healthcare spending burden holds true even when we look at sub-groups among our sample—by age, income groups, and gender (Exhibit 14). Generally across our 23 states, lower-income families, women, and older families are the most burdened, spending 2.8 percent, 2.0 percent, and 1.9 percent of their take-home income on healthcare respectively (Exhibit 7). Among these most burdened groups, those in Utah continue to rank the highest compared to those in other states. For example in 2017, healthcare spending burden among low-income families was 5.7 percent in Utah compared to 2.8 percent among all 23 states (Exhibit 14). Estimates and standard errors for demographic groups shown in Exhibit 14 are included in Exhibit 22, 23, and 24 of the Appendix.

Utah's comparatively high healthcare spending burden holds true even when we looked at sub-groups among our sample—by age, income groups,and gender.

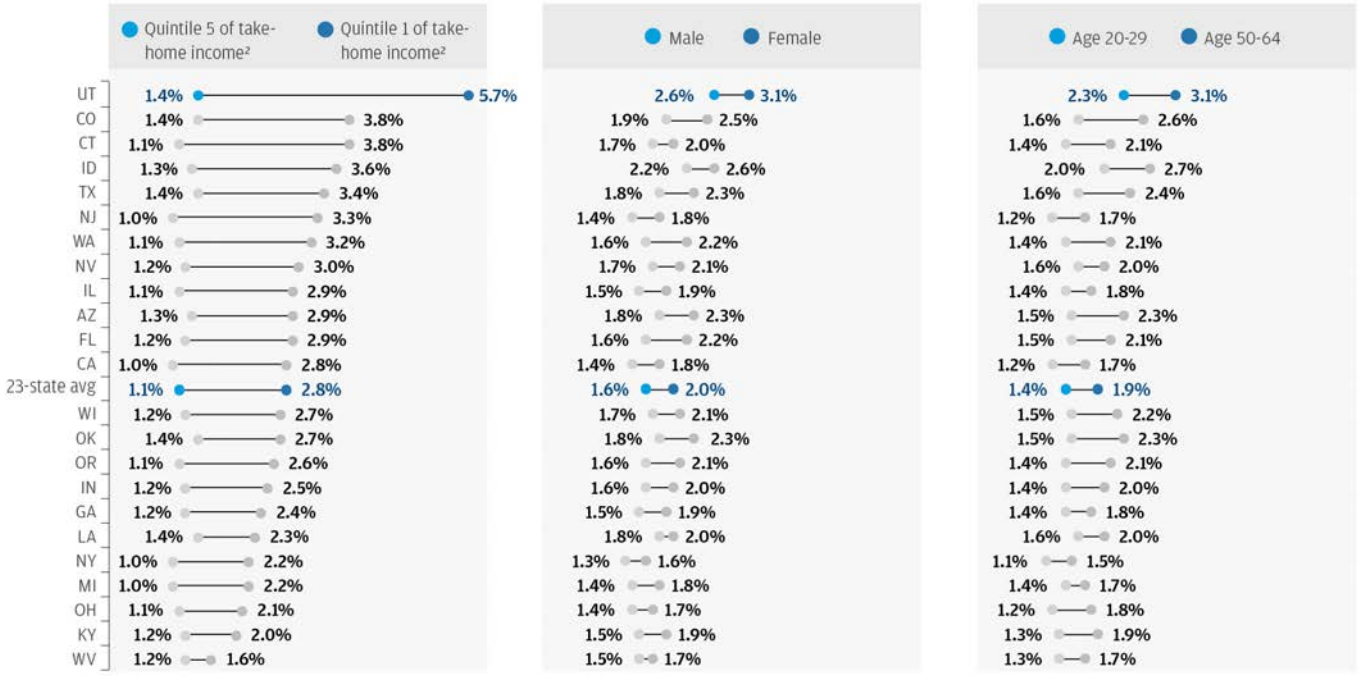
In terms of total healthcare expenditure per capita, Utah has typically been identified as a low-spending state (Centers for Medicare & Medicaid Services, 2017) due to its unique demographic profile, which involves a small elderly population, a sizable middle class, as well as more active lifestyle (Utah Foundation, 2018). However, there is very limited information on Utah's out-of-pocket healthcare costs, which is what we measure. There are several plausible explanations for Utah's high out-of-pocket healthcare spending and burden based on JPMCI HOSP data. First, Utah has by far the largest household size of 3.19 persons per household in the nation, compared to the national average of 2.65 (University of Utah, 2018). Since JPMCI HOSP's unit of analysis is the primary account holder, it is likely that Utah's larger household size may contribute to higher spending observed because the primary account holder could be paying for more family members' out-of-pocket costs. Second, enrollment in HSA-eligible high-deductible plans in Utah has increased significantly in just the last four

years—from 19 percent in 2013 to 30 percent in 2016 (Utah Insurance Department, 2014 and 2017). The national average increased from 17 percent to 24 percent over the same time frame (Kaiser Family Foundation, 2017). In the past decade, the average deductible for a family plan in Utah increased by 47 percent from $1,777 in 2006 to $2,606 in 2016 (Utah Foundation, 2018). If such trends sustained through 2017, higher deductibles could have led to higher out-of-pocket costs.

Exhibit 14

Utah tops the charts for healthcare spending burden, especially among women, older, and lower-income account holders in 2017.

Healthcare spending burden in 2017 by demographic group and state[1]



[1] We display estimates below for the youngest and oldest age groups and the lowest and highest income quintiles. Estimates for the other age groups and income quintiles are in the Data Asset sections. In general quintiles are in the Data Asset sections. In general healthcare spending burden increased monotonically with age and income.

[2] Ranges of take-home income quintiles in 2017: Quintile 1 (<$14K), Quintile 2 ($14K - $25K), Quintile 3 ($25K - $42K), Quintile 4 ($42K - $72K), and Quintile 5 (>$72K). We report statistics by the gender of the primary account holder for the XX percent of account holders for whom gender could be inferred.

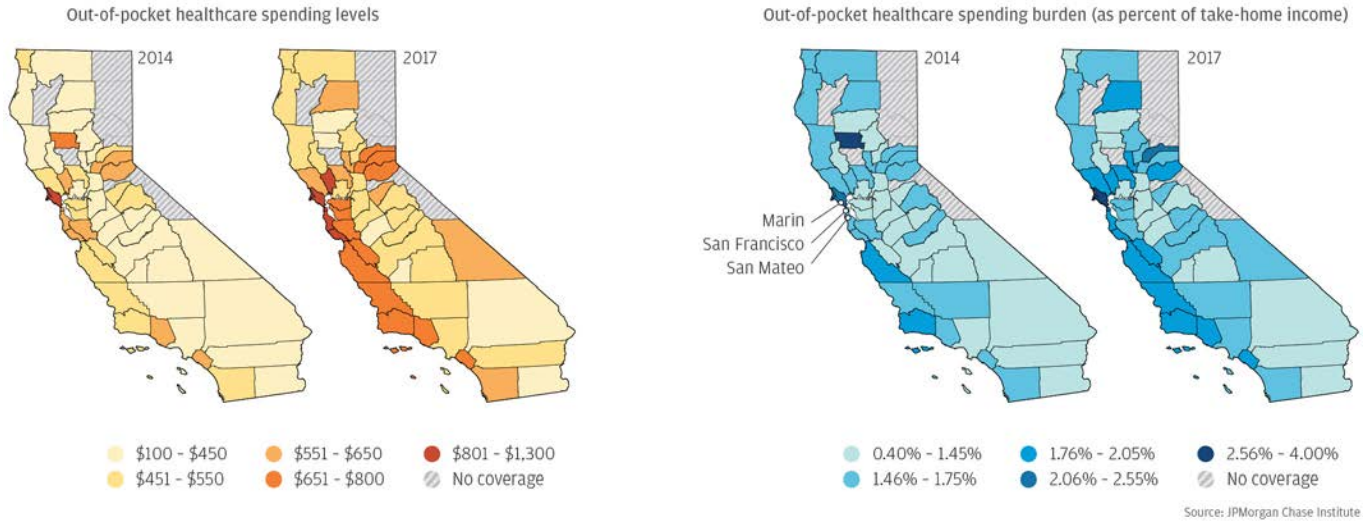
Source: JPMorgan Chase Institute

The high healthcare spending growth we observed in California in 2017 holds true across different demographics groups, indicating that all sub-populations experienced roughly comparable increases in out-of-pocket healthcare expenditures.[9]

In Exhibit 15 we show healthcare spending and burden in California by county. Top-spending counties in California tend to be high-income and located along the coast, especially in the Bay Area. For example, Marin County, a Bay Area county, had the highest level of healthcare spending in 2017. The top three counties in terms of spending levels are Marin, San Francisco, and San Mateo (Exhibit 16), where the average annual growth rates exceeded 10 percent from 2014 to 2017. In fact, there were a total of 13 counties in California that had average annual growth exceeding 10 percent during this time period. High-income groups generally tend to spend more on healthcare (Exhibit 7). These coastal areas in California have high income and high costs of living, which may translate to high county averages in healthcare spending, leading to the geographic gradient we see in Exhibit 15. However, it is noteworthy that the growth in these high-income counties exceeded the growth in spending across our 23 states even among the high-income group. This underscores that these coastal regions in California have experienced considerable growth in healthcare spending during the last few years, and especially in 2017.

Exhibit 15

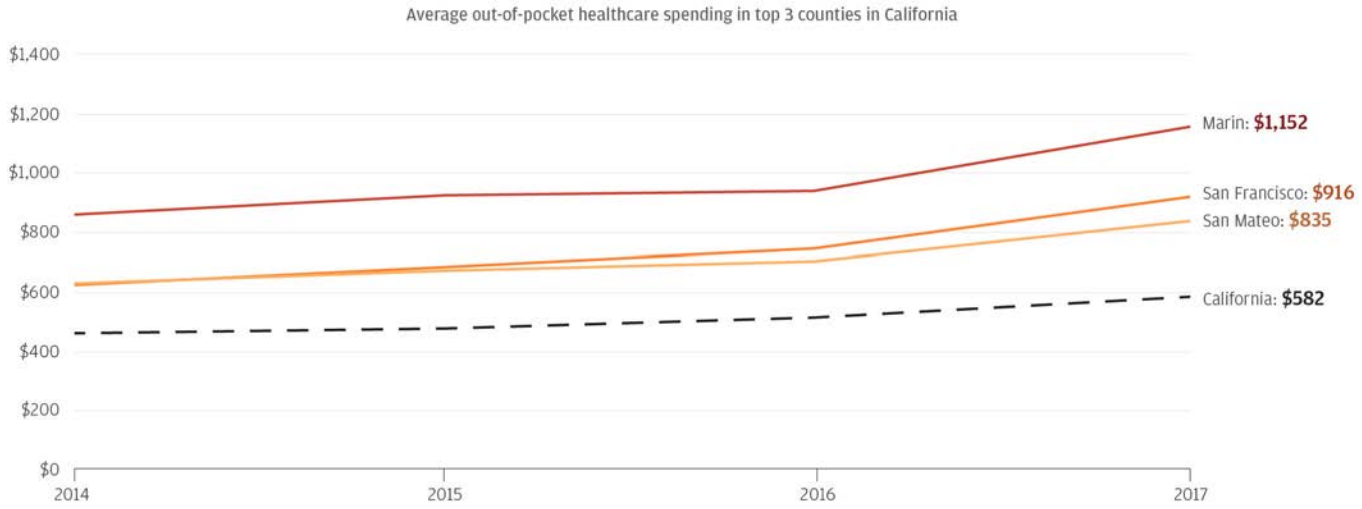
California saw high growth in healthcare spending in 2017, especially in coastal areas.



Source: JPMorgan Chase Institute

Exhibit 16

Marin, San Francisco, and San Mateo are California's top 3 counties for healthcare spending in 2017.



Source: JPMorgan Chase Institute

Finding Four

Out-of-pocket healthcare spending grew the most at hospitals and 'other medical services, equipment, and labs' and decreased at drug stores for the third consecutive year.

Payments to dental offices, doctors' offices, and 'other' healthcare providers, including other medical services, equipment, and labs, represented the largest spending categories and accounted for 68 percent of all the healthcare spending dollars we observe. Over the last three years, the largest and fastest growing category of spending is 'other'. The vast majority of this 'other' category (roughly 85 percent) represents medical services we cannot further specify but also small service categories, such as nursing, home health services, and ambulance. These other medical services represent the subcomponent of 'other' that has been growing the fastest, with double digit growth in 2016 and 2017. The remaining roughly 15 percent of 'other' represents medical and dental equipment and labs, which have also been growing each year but considerably slower, with single digit growth in each year. Out of the 8.5 percent growth in spending we observed from 2016 to 2017, the 'other' category accounted for 45 percent of the growth (Exhibit 18). Aside from the spending at 'other', spending at hospitals also grew significantly by 8.0 percent on average over the last four years.

Exhibit 17

Spending at other medical services, equipment, and labs and hospitals saw the fastest average annual growth from 2014 to 2017.

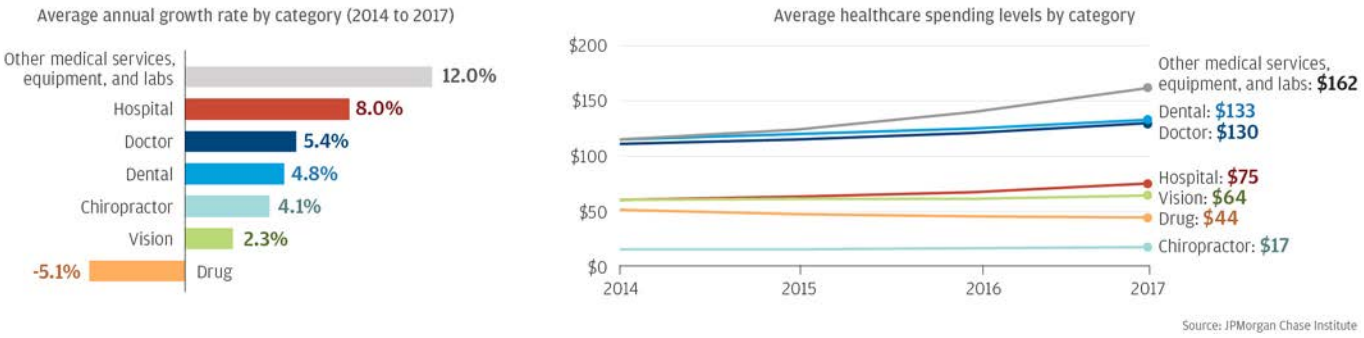
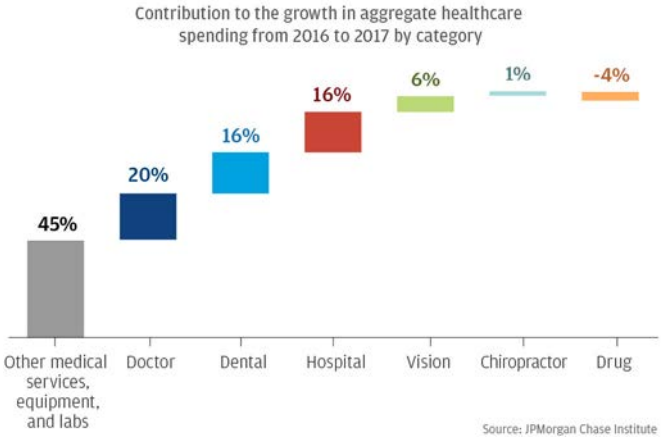


Exhibit 18

Spending at other medical services, equipment, and labs contributed 45 percent of the aggregate growth in average healthcare spending from 2016 to 2017.

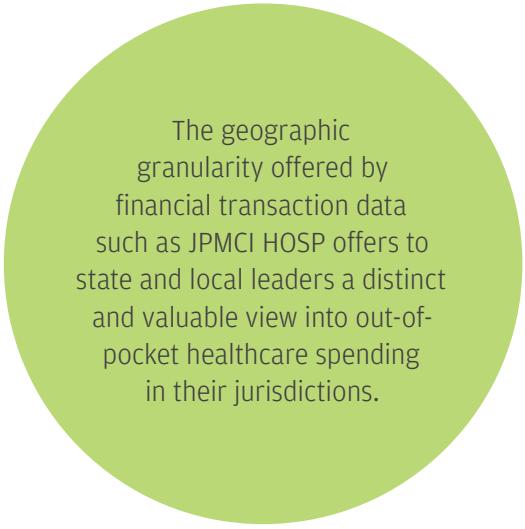


While every other category has shown positive growth, spending at drug stores has trended downwards consistently every year. On average, drug spending slowed by 5.1 percent annually between 2014 and 2017. It is important to note that our estimates of the levels of drug spending are particularly conservative, as we assessed drug spending differently depending on the type of merchant in order to exclude non-drug purchases at drug stores.[10] For example, we only classified transactions at major drugstore chains that were multiples of $5 to $300 as drug spending based on the assumption that these were co-pays. In contrast, we included all transactions at online and independent drug stores. As a result, we have a conservative estimate of drug spending that may also be sensitive to aggregate changes in how people are sourcing their drugs. For example, if a significant amount of drug spending migrated from independent pharmacies, where we included all transactions, to major drugstore chains, where we included only transactions that were multiples of $5, estimated drug spending could decrease.

Implications

For three consecutive years, out-of-pocket healthcare spending has accelerated. We observed positive growth across every state and demographic group and an acceleration since 2014. In addition, for the first time in three years, we observed an uptick in the burden of healthcare spending as a fraction of take-home income. This increase in burden occurred across demographic groups but was largest among families in the lowest income quintile and families living in Utah. Those in Utah spent almost three percent of their take-home pay on out-of-pocket healthcare costs in 2017, higher than the 23-state average of 1.7 percent.

The growth in overall spending could be attributed to a number of factors including changes in healthcare prices, utilization, and cost sharing arrangements within healthcare insurance plans. For example, a decrease in the uninsured population has increased utilization and propelled a shift towards high deductible plans, boosting out-of-pocket spending (Hartman et al. 2017). Evidence from bank account and credit card transactions presented here suggest that these changes in the healthcare landscape have ultimately contributed to an acceleration in out-of-pocket healthcare spending for families in the past three years.



The one exception to the growth pattern was drug spending, which ticked downwards in all three years. The evolution of the drug market and the healthcare landscape could jointly account for this downward inclination seen in drug spending growth. An uptick in regulations, competitive negotiations between suppliers and purchasers, and increased competition in the generic drug market may have resulted in lower drug prices (IMS Institute for Healthcare Informatics, 2015). In addition, an increase in use of generic drugs relative to patented drugs or a decrease in drug utilization overall could also have resulted in lower drug spending. Finally, expanded health insurance coverage has also stimulated the creation of more cost-containment policies like rebates and discounts to target drug spending (Hartman et al. 2017).

Our large sample size allows us to offer granular data that complement national benchmarks in important ways. In fact, our data revealed important state and local trends in healthcare spending. At the state-level, California saw high growth in healthcare spending, and Utah saw high growth in healthcare spending burden. At the county-level, we observed high healthcare spending growth especially along the coastal region of California. The geographic granularity of JPMCI HOSP offers to state and local leaders a distinct and valuable view into out-of-pocket healthcare spending in their jurisdictions.

The growth in out-of-pocket healthcare spending is important because it may increase the extent to which people's cash flow dynamics affect their decisions about when to pay for and receive healthcare. As detailed in our report "Deferred Care: How tax refunds enable healthcare spending," account holders increased their out-of-pocket healthcare spending by 60 percent in the week after receiving a tax refund, and the arrival of the tax refund influenced when people received care, not just when they paid for it (Farrell, Greig, and Hamoudi, 2018). Put differently, out-of-pocket healthcare costs affect decisions about whether and when to seek medical care. Because of the importance of prevention and early intervention in mitigating total healthcare costs, deferring care could result in worse healthcare outcomes and larger costs. Therefore it is critical that we continue to monitor the levels and trends in out-of-pocket healthcare costs borne by families, as we seek to do with the JPMCI HOSP data asset.

Data Asset

JPMC Institute Public Data Privacy Notice

The JPMorgan Chase Institute utilizes rigorous security protocols to ensure all customer information is kept confidential and secure. Out strict protocols and standards are based on those employed by government agencies and we work with technology, data privacy and security experts to maintain industry leading standards.

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- Removing all unique identifiable information – including names, account numbers, addresses, dates of birth, and Social Security Numbers before the Institute receives the data.
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The Institute prides itself on providing valuable insights top policymakers, businesses, and nonprofit leaders. But these insights do not come at the expense of JPMorgan Chase customer privacy or security.

Updates to sampling and weighting approaches

In order to provide a more reliable and representative estimate of healthcare spending, we made two key changes to the JPMCI HOSP data asset since its first release in Farrell and Greig (2017): sampling and weighting. First, we shifted our sampling approach from a stable cohort of families who met our sampling criteria for 48 consecutive months from January 2013 through December 2016 in our last release to now rolling cohorts of families with a Chase checking account who met the following criteria for minimum two years prior. They have:

(a) at least five outflows from their checking account every month for all 12 months,

(b) at least $5,000 in annual take-home income, and

(c) less than 50 percent of their annual spending on channels we cannot categorize, such as checks, cash, and non-Chase credit cards.

For example, the estimates for 2014 are based on a sample of customers with at least five outflows every month, at least $5,000 in annual take-home income, and less than 50 percent of spending on uncategorized channels in 2013 and 2014. Similarly, the estimates for 2015 are based on a sample of customers who meet these criteiria for 2014 and 2015, or from 2013 to 2015. Because the JPMCI HOSP data asset ranges from 2013 to 2017, we no longer provide estimates for 2013 based on our minimum two-year rolling cohort sampling approach since our data series only start in 2013. The sample is balanced for monthly estimates within a calendar year, but changes from one calendar year to the next. Our total sample sizes across all 23 states were 3.8 million in 2014, 3.9 million in 2015, 4.2 million in 2016, and 4.7 million in 2017.

This rolling cohort sampling approach has several advantages over the stable cohort sample in our previous release. While the stable cohort measured the same people every single year, it selected for account holders with long and potentially increasingly strong relationships with Chase over the four years. The minimum two-year rolling cohort allows each annual observation to have a more comparable relationship with Chase and include families who may have shifted their banking activities to Chase more recently. Moving to the rolling cohort also has the ancillary benefit of increasing our annual sample size from 2.3 million in Farrell and Greig (2017) to 4.7 million in 2017.

The second key change we made to the HOSP data asset was the sample weighting approach. The HOSP sample draws on families who reside within the 23 states with a Chase branch footprint. In order to make each state sample more representative of the general population within that state, we re-weight each state's sample to match the joint age and gross income distribution within that state according to the American Community Survey (ACS) for each year from 2014 through 2017.[11] Our unit of analysis is the primary account holder, whom we refer to as a family. When reweighting our sample, we match the joint age and income distribution of our primary account holders to the heads of family in the ACS.[12]

The income estimates we previously used for weighting were only available as recently as 2014, and weights were calculated for 2014 and applied uniformly across the timeframe. Our new approach leverages the new JPMorgan Chase Institute Income Estimate (JPMC IIE), which is an estimate of gross family income developed using machine learning techniques to generate an income estimate based on checking account and credit card attributes. Since at the time of publishing, ACS estimates for 2017 were not available whereas JPMC IIE was, we extrapolated the ACS income tercile cut-offs by multiplying 2016 cut-offs with the average annual growth in tercile cut-offs from 2013-2016 to reweight our 2017 population.

As a result of these sampling changes, our revised estimates of out-of-pocket healthcare spending for 2014 through 2016 are slightly lower than previously published. For example, our updated estimate for 2016 is $625, roughly 12 percent lower than our previous estimate of $714. Since we observe out-of-pocket healthcare spending exclusively through payments made via debit cards, credit cards, and electronic channels, our estimated out-of-pocket spending levels are lower-bound estimates to begin with (Farrell and Greig, 2017). Our new estimates put us slightly further away from the benchmarks in terms of overall levels of out-of-pocket healthcare spending, but offer more reliable estimates of year-over-year growth in healthcare spending. The new sampling and weighting approaches did not result in changes to our estimates of the burden of healthcare spending as a fraction of take-home income of 1.6 percent in 2014, 2015, and 2016.

Precision guidelines

Given our sample size, our estimates generally have very small standard errors when we are reporting for the 23 states where we have branch coverage and hence large sample sizes. However, since Chase Bank has different levels of geographic coverage across states, our sample sizes are not distributed evenly. As a result, estimates for some states have larger standard errors than others. Hence, for state-level and county-level estimates of means and ratios, we provide standard errors and confidence intervals. Across our estimates, we do not display any estimates that have relative standard errors (RSE) larger than 50 percent, mark any estimates with RSE between 30 and 50 percent to caution the lack of precision. We display estimates with RSE less than 30 percent without caution.[13] We calculate RSE as standard error / estimate. We calculate standard errors and 95 percent confidence intervals for all our estimates of means and ratios using a bootstrap method. If RSE > 0.5, we do not display the estimates due to large standard errors. If 0.3<=RSE<=0.5, we report the estimates with caution on the lack of precision. If RSE < 0.3, we display the estimates without caution. This standard is in accordance with Medical Expenditure Panel Survey's precision guidelines (Agency for Healthcare Research and Quality).

Appendix

Exhibit 19

Ranges of take-home income quintiles

	2014	2015	2016	2017
Quintile 1	< $13K	< $14K	<$14K	<$14K
Quintile 2	$13K - $22K	$14K - $23K	$14K - $24K	$14K - $25K
Quintile 3	$22K - $38K	$23K - $39K	$24K - $41K	$25K - $42K
Quintile 4	$38K - $64K	$39K - $66K	$41K - $69K	$42K - $72K
Quintile 5	> $64K	> $66K	> $69K	> $72K

Source: JPMorgan Chase Institute

Ranges of gross income quintiles based on JPMorgan Chase Institute Income Estimate (JPMC IIE)

	2014	2015	2016	2017
Quintile 1	< $27.4K	< $28.6K	<$29.2K	<$29.7K
Quintile 2	$27.4K - $40.1K	$28.6K - $41.5K	$29.2K - $42.5K	$29.7K - $44.3K
Quintile 3	$40.1K - $65.6K	$41.5K - $68.1K	$42.5K - $69.6K	$44.3K - $71.7K
Quintile 4	$65.6K - $97.5K	$68.1K - $101.4K	$69.6K - $105.3K	$71.7K - $107.9K
Quintile 5	> $97.5K	> $101.4K	> $105.3K	> $107.9K

Source: JPMorgan Chase Institute

Exhibit 20

Average out-of-pocket healthcare spending levels by age and take-home income quintile (2017)

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 4	Mean
20-29	$190	$246	$363	$579	$901	$345
30-39	$259	$320	$458	$718	$1,139	$583
40-49	$290	$368	$518	$763	$1,274	$701
50-64	$287	$429	$626	$851	$1,307	$724
Mean	$262	$350	$506	$765	$1,242	

Source: JPMorgan Chase Institute

Average out-of-pocket healthcare spending burden by age and take-home income quintile (2017)

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 4	Mean
20-29	2.0%	1.3%	1.1%	1.1%	1.0%	1.4%
30-39	2.8%	1.7%	1.4%	1.3%	1.1%	1.6%
40-49	3.1%	1.9%	1.6%	1.4%	1.1%	1.7%
50-64	3.0%	2.2%	1.9%	1.5%	1.1%	1.9%
Mean	2.8%	1.8%	1.5%	1.4%	1.1%	

*The JPMCI estimated gross income is developed using machine learning techniques to generate an income estimate based on checking account and credit card attributes.

Source: JPMorgan Chase Institute

Exhibit 21

Yearly average out-of-pocket healthcare spending levels by state

State	2014		2015		2016		2017	
	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error
UT	$701.4	$7.4	$716.0	$8.2	$787.1	$8.3	$863.7	$8.6
CO	$672.1	$4.5	$693.6	$4.8	$725.1	$5.0	$797.3	$4.7
CT	$654.9	$10.2	$678.9	$10.0	$719.8	$10.6	$782.2	$10.0
TX	$636.3	$1.5	$662.7	$1.4	$686.5	$1.6	$730.1	$1.6
NJ	$577.3	$3.7	$603.4	$3.8	$646.6	$3.8	$702.0	$3.9
ID	$596.5	$20.1	$609.5	$13.5	$652.3	$10.8	$701.7	$12.5
WI	$534.4	$4.6	$577.8	$4.7	$623.1	$5.3	$691.7	$5.8
IL	$566.9	$2.0	$584.5	$2.1	$622.5	$2.4	$674.3	$2.3
OK	$606.1	$7.2	$608.4	$7.2	$646.9	$7.2	$667.8	$7.3
AZ	$579.4	$2.3	$587.5	$2.7	$622.6	$2.9	$659.1	$2.7
WA	$593.0	$6.6	$607.2	$4.3	$610.2	$3.3	$652.1	$3.9
IN	$520.3	$2.4	$535.6	$2.7	$569.1	$3.0	$608.5	$2.6
LA	$539.5	$3.0	$569.8	$3.8	$586.9	$3.7	$605.4	$3.8
FL	$502.2	$1.8	$528.3	$2.0	$551.2	$2.0	$590.2	$2.0
CA	$459.6	$1.2	$476.3	$1.2	$513.1	$1.1	$582.3	$1.3
NV	$520.7	$5.4	$515.4	$5.7	$557.3	$6.0	$574.3	$6.0
OR	$543.0	$8.3	$533.5	$5.8	$540.0	$4.0	$573.7	$4.6
NY	$456.5	$1.7	$472.4	$1.6	$501.2	$1.7	$558.1	$1.8
GA	$461.6	$4.0	$481.4	$4.2	$535.8	$4.5	$557.1	$4.5
OH	$484.1	$2.0	$495.8	$2.1	$516.0	$2.3	$550.6	$2.3
MI	$460.0	$2.1	$471.4	$2.3	$501.0	$2.2	$540.1	$2.5
KY	$465.3	$4.8	$473.8	$4.9	$503.6	$4.9	$540.1	$5.2
WV	$468.2	$6.7	$467.6	$7.3	$488.0	$7.0	$495.0	$7.9

Source: JPMorgan Chase Institute

Yearly average out-of-pocket healthcare spending burden by state

State	2014		2015		2016		2017	
	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error
UT	2.31%	0.03%	2.30%	0.03%	2.44%	0.04%	2.76%	0.04%
ID	2.18%	0.11%	2.24%	0.08%	2.30%	0.06%	2.36%	0.06%
CO	2.03%	0.02%	2.02%	0.02%	2.03%	0.02%	2.15%	0.02%
TX	1.90%	0.01%	1.89%	0.01%	1.94%	0.01%	2.03%	0.01%
OK	2.00%	0.03%	1.90%	0.03%	2.03%	0.04%	2.01%	0.04%
AZ	1.93%	0.01%	1.91%	0.01%	1.94%	0.01%	1.98%	0.01%
FL	1.78%	0.01%	1.76%	0.01%	1.80%	0.01%	1.89%	0.01%
WI	1.57%	0.02%	1.68%	0.02%	1.79%	0.02%	1.89%	0.02%
LA	1.76%	0.02%	1.79%	0.02%	1.86%	0.02%	1.88%	0.02%
NV	1.86%	0.03%	1.77%	0.03%	1.88%	0.03%	1.87%	0.03%
WA	1.80%	0.03%	1.78%	0.02%	1.79%	0.01%	1.83%	0.01%
OR	1.87%	0.05%	1.79%	0.03%	1.77%	0.02%	1.82%	0.02%
CT	1.59%	0.04%	1.59%	0.03%	1.68%	0.04%	1.80%	0.04%
IN	1.66%	0.01%	1.61%	0.01%	1.66%	0.01%	1.75%	0.01%
KY	1.59%	0.03%	1.53%	0.02%	1.58%	0.03%	1.66%	0.03%
IL	1.52%	0.01%	1.51%	0.01%	1.57%	0.01%	1.66%	0.01%
GA	1.50%	0.02%	1.51%	0.02%	1.65%	0.02%	1.66%	0.02%
MI	1.48%	0.01%	1.49%	0.01%	1.51%	0.01%	1.59%	0.01%
WV	1.65%	0.04%	1.56%	0.04%	1.58%	0.03%	1.57%	0.04%
NJ	1.39%	0.01%	1.40%	0.01%	1.46%	0.01%	1.56%	0.01%
CA	1.41%	0.01%	1.39%	0.01%	1.43%	0.00%	1.55%	0.01%
OH	1.45%	0.01%	1.42%	0.01%	1.45%	0.01%	1.53%	0.01%
NY	1.28%	0.01%	1.28%	0.01%	1.33%	0.01%	1.40%	0.01%

Source: JPMorgan Chase Institute

Exhibit 22

Average out-of-pocket healthcare spending levels by state and income group[1] (2017)

State	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error
CO	$ 358.5	$ 8.3	$ 444.3	$ 8.3	$ 613.4	$ 8.1	$ 931.4	$ 9.7	$ 1,549.2	$ 14.8
TX	$ 321.5	$ 2.3	$ 398.3	$ 2.5	$ 570.3	$ 2.6	$ 871.5	$ 3.3	$ 1,534.2	$ 5.5
OK	$ 262.0	$ 10.1	$ 397.1	$ 13.9	$ 625.4	$ 12.7	$ 899.5	$ 14.9	$ 1,510.5	$ 27.4
UT	$ 534.4	$ 18.3	$ 585.1	$ 13.7	$ 711.7	$ 13.2	$ 1,018.4	$ 18.3	$ 1,489.8	$ 31.0
CT	$ 351.3	$ 20.4	$ 383.7	$ 17.3	$ 516.7	$ 16.2	$ 747.4	$ 15.4	$ 1,471.9	$ 29.6
LA	$ 221.2	$ 5.2	$ 378.1	$ 7.4	$ 583.8	$ 4.9	$ 873.8	$ 6.7	$ 1,438.7	$ 10.8
AZ	$ 275.8	$ 4.2	$ 387.3	$ 4.9	$ 577.5	$ 4.4	$ 887.7	$ 6.2	$ 1,404.9	$ 10.0
ID	$ 353.0	$ 18.9	$ 465.8	$ 20.4	$ 673.2	$ 23.2	$ 967.0	$ 25.9	$ 1,368.6	$ 44.8
IL	$ 272.4	$ 3.6	$ 334.8	$ 3.8	$ 484.9	$ 3.7	$ 753.3	$ 3.9	$ 1,324.9	$ 6.2
WI	$ 268.6	$ 8.6	$ 409.2	$ 8.7	$ 591.4	$ 9.9	$ 892.4	$ 11.4	$ 1,308.9	$ 17.7
GA	$ 227.2	$ 5.9	$ 331.8	$ 7.0	$ 472.3	$ 6.8	$ 715.7	$ 8.4	$ 1,282.6	$ 17.3
IN	$ 239.4	$ 4.0	$ 345.2	$ 4.9	$ 534.0	$ 4.5	$ 825.5	$ 5.8	$ 1,266.9	$ 9.3
FL	$ 279.4	$ 3.5	$ 370.0	$ 3.6	$ 537.3	$ 3.2	$ 778.4	$ 4.0	$ 1,255.4	$ 7.9
NJ	$ 302.1	$ 7.2	$ 361.9	$ 6.7	$ 463.3	$ 5.5	$ 687.7	$ 7.3	$ 1,236.0	$ 9.8
NV	$ 290.7	$ 10.1	$ 360.5	$ 9.9	$ 501.1	$ 8.9	$ 741.7	$ 12.2	$ 1,227.8	$ 24.1
KY	$ 198.9	$ 9.4	$ 329.7	$ 8.5	$ 525.3	$ 7.3	$ 810.6	$ 10.4	$ 1,223.4	$ 18.7
WV	$ 156.8	$ 10.4	$ 331.8	$ 9.2	$ 528.2	$ 10.6	$ 818.8	$ 15.9	$ 1,172.2	$ 27.4
OH	$ 201.0	$ 3.3	$ 305.9	$ 3.6	$ 477.4	$ 3.9	$ 737.6	$ 4.6	$ 1,157.8	$ 7.7
NY	$ 207.8	$ 2.4	$ 271.1	$ 2.5	$ 423.7	$ 2.6	$ 654.2	$ 3.1	$ 1,138.7	$ 4.9
WA	$ 295.2	$ 5.7	$ 408.6	$ 7.0	$ 545.8	$ 6.1	$ 774.3	$ 7.1	$ 1,125.0	$ 9.9
OR	$ 252.0	$ 6.8	$ 371.4	$ 8.4	$ 542.8	$ 8.1	$ 790.2	$ 8.8	$ 1,119.5	$ 14.8
CA	$ 261.9	$ 2.1	$ 323.0	$ 2.2	$ 447.9	$ 2.0	$ 678.9	$ 2.7	$ 1,065.8	$ 4.2
MI	$ 209.0	$ 3.4	$ 336.0	$ 4.5	$ 504.6	$ 4.0	$ 720.4	$ 5.2	$ 1,064.9	$ 8.0

[1]Ranges of take-home income quintiles in 2017:Quintile 1 (<$14K), Quintile 2 ($14K - $25K), Quintile 3 ($25K - $42K), Quintile 4 ($42K - $72K), and Quintile 5 (>$72K).

Source: JPMorgan Chase Institute

Average out-of-pocket healthcare spending burden by state and income group[1] (2017)

State	Quintile 1		Quintile 2		Quintile 3		Quintile 4		Quintile 5	
	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error
UT	5.70%	0.21%	3.00%	0.07%	2.20%	0.04%	1.83%	0.03%	1.44%	0.03%
CO	3.79%	0.09%	2.30%	0.04%	1.87%	0.02%	1.67%	0.02%	1.38%	0.01%
CT	3.77%	0.22%	1.97%	0.09%	1.58%	0.05%	1.36%	0.03%	1.07%	0.02%
ID	3.60%	0.18%	2.42%	0.11%	2.05%	0.07%	1.74%	0.05%	1.34%	0.04%
TX	3.41%	0.03%	2.07%	0.01%	1.73%	0.01%	1.57%	0.01%	1.36%	0.00%
NJ	3.28%	0.08%	1.85%	0.04%	1.42%	0.02%	1.24%	0.01%	0.96%	0.01%
WA	3.19%	0.06%	2.11%	0.04%	1.67%	0.02%	1.38%	0.01%	1.07%	0.01%
NV	3.03%	0.11%	1.88%	0.05%	1.52%	0.03%	1.34%	0.02%	1.18%	0.02%
IL	2.93%	0.04%	1.73%	0.02%	1.47%	0.01%	1.35%	0.01%	1.11%	0.01%
AZ	2.90%	0.05%	2.03%	0.03%	1.76%	0.01%	1.59%	0.01%	1.34%	0.01%
FL	2.90%	0.04%	1.94%	0.02%	1.63%	0.01%	1.41%	0.01%	1.19%	0.01%
CA	2.80%	0.02%	1.67%	0.01%	1.37%	0.01%	1.21%	0.00%	0.98%	0.00%
WI	2.72%	0.09%	2.11%	0.05%	1.79%	0.03%	1.61%	0.02%	1.25%	0.02%
OK	2.71%	0.11%	2.08%	0.08%	1.88%	0.04%	1.64%	0.03%	1.39%	0.02%
OR	2.64%	0.07%	1.94%	0.04%	1.64%	0.02%	1.43%	0.02%	1.11%	0.01%
IN	2.51%	0.05%	1.79%	0.03%	1.62%	0.01%	1.49%	0.01%	1.21%	0.01%
GA	2.40%	0.07%	1.73%	0.04%	1.43%	0.02%	1.29%	0.02%	1.20%	0.02%
LA	2.31%	0.05%	1.98%	0.04%	1.75%	0.01%	1.59%	0.01%	1.38%	0.01%
NY	2.23%	0.03%	1.41%	0.01%	1.28%	0.01%	1.17%	0.01%	0.97%	0.00%
MI	2.17%	0.04%	1.76%	0.02%	1.53%	0.01%	1.30%	0.01%	1.00%	0.01%
OH	2.10%	0.04%	1.59%	0.02%	1.44%	0.01%	1.33%	0.01%	1.10%	0.01%
KY	2.05%	0.10%	1.71%	0.04%	1.58%	0.02%	1.47%	0.02%	1.21%	0.02%
WV	1.62%	0.12%	1.74%	0.05%	1.59%	0.03%	1.49%	0.03%	1.19%	0.03%

[1]Ranges of take-home income quintiles in 2017: Quintile 1 (<$14K), Quintile 2 ($14K - $25K), Quintile 3 ($25K - $42K), Quintile 4 ($42K - $72K), and Quintile 5 (>$72K).

Source: JPMorgan Chase Institute

Exhibit 23

Average out-of-pocket healthcare spending levels by state and gender (2017)

	Female		Male	
State	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error
UT	$860.1	$13.4	$900.5	$13.6
CO	$833.3	$7.9	$817.6	$7.4
CT	$763.2	$16.7	$912.0	$20.0
TX	$720.3	$2.6	$783.9	$2.9
ID	$713.4	$19.9	$716.8	$18.0
NJ	$694.1	$6.2	$783.7	$7.2
WA	$686.9	$6.0	$655.3	$5.3
IL	$672.3	$3.4	$740.5	$3.7
WI	$672.3	$8.2	$736.8	$8.7
AZ	$671.3	$4.9	$679.1	$4.2
OK	$643.9	$13.1	$734.2	$12.4
FL	$629.1	$3.8	$598.5	$3.8
OR	$605.8	$7.4	$566.5	$6.2
CA	$603.1	$2.3	$584.6	$2.1
IN	$591.9	$4.5	$661.5	$4.4
NY	$588.4	$2.8	$616.0	$3.2
LA	$577.4	$6.3	$686.0	$6.0
NV	$577.3	$10.2	$590.1	$9.5
GA	$570.5	$7.6	$612.5	$8.0
OH	$539.6	$3.3	$596.9	$3.6
KY	$537.7	$9.0	$574.0	$7.9
MI	$537.2	$4.2	$579.6	$4.2
WV	$462.2	$13.3	$538.6	$10.2

Source: JPMorgan Chase Institute

Average out-of-pocket healthcare spending burden by state and gender (2017)

State	Female		Male	
	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error
UT	3.09%	0.06%	2.57%	0.07%
ID	2.61%	0.09%	2.18%	0.08%
CO	2.53%	0.04%	1.90%	0.03%
TX	2.31%	0.01%	1.82%	0.01%
OK	2.29%	0.07%	1.84%	0.04%
AZ	2.27%	0.02%	1.78%	0.02%
FL	2.20%	0.02%	1.62%	0.01%
WA	2.16%	0.03%	1.60%	0.02%
WI	2.14%	0.04%	1.70%	0.03%
NV	2.13%	0.06%	1.68%	0.04%
OR	2.08%	0.04%	1.59%	0.03%
CT	2.04%	0.06%	1.72%	0.07%
LA	2.03%	0.03%	1.82%	0.03%
IN	1.97%	0.02%	1.62%	0.02%
GA	1.91%	0.04%	1.50%	0.03%
IL	1.88%	0.02%	1.53%	0.01%
KY	1.88%	0.04%	1.51%	0.03%
MI	1.81%	0.02%	1.44%	0.02%
CA	1.79%	0.01%	1.37%	0.01%
NJ	1.79%	0.02%	1.44%	0.02%
OH	1.71%	0.02%	1.42%	0.01%
WV	1.67%	0.09%	1.52%	0.04%
NY	1.61%	0.01%	1.28%	0.01%

Source: JPMorgan Chase Institute

Exhibit 24

Average out-of-pocket healthcare spending levels by state and age group (2017)

State	Age 20-29		Age 30-39		Age 40-49		Age 50-64	
	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error	Healthcare spending levels	Standard error
UT	$519.1	$10.3	$863.7	$14.7	$1,014.4	$19.7	$1,017.0	$20.8
CO	$403.6	$4.8	$731.0	$7.0	$909.9	$10.7	$996.3	$10.7
CT	$371.1	$11.4	$625.3	$14.7	$873.8	$20.7	$929.7	$20.5
TX	$399.0	$1.9	$672.0	$2.7	$813.1	$3.0	$882.5	$3.5
WI	$361.0	$6.3	$642.2	$8.8	$798.9	$12.6	$810.9	$10.5
ID	$391.9	$12.7	$704.2	$20.9	$790.0	$24.9	$810.2	$23.7
NJ	$347.9	$4.2	$608.6	$6.4	$771.0	$7.1	$803.1	$7.8
OK	$368.1	$8.9	$638.6	$15.1	$752.9	$19.1	$796.1	$14.5
AZ	$348.2	$3.3	$601.2	$5.5	$757.0	$6.3	$784.4	$5.4
WA	$351.5	$4.7	$615.5	$6.6	$744.3	$6.6	$775.9	$7.2
IL	$355.8	$2.7	$632.3	$4.0	$772.5	$5.0	$771.5	$4.5
IN	$346.8	$3.4	$577.6	$4.8	$689.7	$6.1	$699.8	$5.8
FL	$323.5	$2.5	$527.6	$3.9	$651.8	$4.3	$677.1	$3.9
LA	$342.6	$3.4	$590.5	$8.9	$699.3	$9.4	$674.6	$6.2
CA	$331.2	$1.6	$542.1	$2.1	$648.2	$2.7	$673.6	$2.7
OR	$309.5	$5.6	$557.4	$8.0	$655.3	$9.2	$668.1	$7.8
NV	$356.7	$7.7	$536.5	$10.3	$640.8	$14.2	$643.4	$11.5
OH	$295.5	$2.5	$510.5	$4.0	$615.9	$4.9	$642.7	$4.0
NY	$309.8	$1.8	$524.8	$3.1	$611.8	$3.7	$639.0	$3.0
GA	$322.2	$4.9	$505.6	$8.1	$642.4	$9.2	$631.6	$9.1
KY	$323.4	$5.9	$519.2	$11.2	$601.8	$12.4	$606.5	$9.4
MI	$304.2	$2.9	$519.6	$4.7	$616.9	$6.0	$605.1	$4.6
WV	$288.4	$8.6	$511.9	$22.0	$531.9	$15.1	$543.6	$12.2

Source: JPMorgan Chase Institute

Average out-of-pocket healthcare spending burden by state and age group (2017)

State	Age 20-29		Age 30-39		Age 40-49		Age 50-64	
	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error	Healthcare spending burden	Standard error
UT	2.28%	0.05%	2.72%	0.07%	2.85%	0.09%	3.07%	0.10%
ID	1.98%	0.08%	2.15%	0.08%	2.32%	0.10%	2.72%	0.11%
CO	1.63%	0.02%	1.94%	0.03%	2.16%	0.04%	2.59%	0.04%
TX	1.55%	0.01%	1.87%	0.01%	2.06%	0.01%	2.35%	0.01%
OK	1.50%	0.04%	1.94%	0.07%	2.00%	0.08%	2.34%	0.06%
AZ	1.48%	0.01%	1.85%	0.03%	2.02%	0.03%	2.27%	0.02%
WI	1.50%	0.03%	1.68%	0.03%	1.77%	0.04%	2.23%	0.05%
WA	1.38%	0.02%	1.71%	0.03%	1.86%	0.03%	2.13%	0.03%
FL	1.46%	0.01%	1.69%	0.02%	1.91%	0.03%	2.13%	0.02%
CT	1.38%	0.05%	1.46%	0.07%	1.77%	0.06%	2.11%	0.08%
OR	1.42%	0.03%	1.74%	0.05%	1.79%	0.05%	2.08%	0.04%
LA	1.55%	0.02%	1.79%	0.04%	1.94%	0.05%	2.04%	0.03%
NV	1.58%	0.04%	1.79%	0.05%	1.91%	0.07%	2.00%	0.05%
IN	1.41%	0.02%	1.68%	0.02%	1.74%	0.02%	1.96%	0.02%
KY	1.33%	0.03%	1.57%	0.07%	1.57%	0.07%	1.90%	0.05%
GA	1.42%	0.03%	1.54%	0.04%	1.70%	0.04%	1.79%	0.03%
IL	1.36%	0.01%	1.63%	0.02%	1.70%	0.02%	1.78%	0.02%
OH	1.18%	0.01%	1.42%	0.02%	1.50%	0.02%	1.76%	0.02%
CA	1.23%	0.01%	1.46%	0.01%	1.57%	0.01%	1.75%	0.01%
MI	1.38%	0.02%	1.55%	0.02%	1.52%	0.02%	1.74%	0.02%
WV	1.30%	0.05%	1.57%	0.18%	1.47%	0.06%	1.73%	0.05%
NJ	1.23%	0.01%	1.42%	0.02%	1.56%	0.02%	1.73%	0.02%
NY	1.14%	0.01%	1.32%	0.01%	1.41%	0.01%	1.54%	0.01%

Source: JPMorgan Chase Institute

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Endnotes

1 Specifically, we observed out-of-pocket healthcare spending exclusively through payments made via debit or credit cards or electronic channels. We were not able to observe healthcare payments made using cash, paper checks, non-Chase creditor debit cards, or pre-paid health savings account cards. In addition, as described in Farrell and Greig (2017), we took a conservative approach in estimating drug spending in order to avoid capturing retail spending at drugstores. As a result, our reported levels of out-of-pocket healthcare spending are lower-bound estimates and generally fall below national benchmarks.

2 The methodology of computing growth rates at the aggregate level is also consistent with the growth rates reported in Exhibit 2 across national benchmarks.

3 Our initial JPMCI HOSP estimates released in 2017 included a growth estimate between 2013 and 2014 of 2.6 percent. Since our current sampling approach requires two years of consistent account activity, we do not have an updated estimate for spending growth from 2013 to 2014.

4 The within-family dollar change in out-of-pocket healthcare spending is similar in magnitude but does not match exactly the dollar change in spending for the aggregate population indicated in Exhibit 1. This is because for the within-family analysis we formed a stable cohort of families present for two years in a row, which represent a subset of the samples used for growth estimates in the aggregate population presented in Exhibit 1.

5 Specific cut-off points for take-home income quintiles in our sample can be found in Exhibit 19 in the Appendix.

6 We report statistics by the gender of the primary account holder for roughly 80 percent of account holders for whom gender could be inferred.

7 We provide state-specific healthcare spending and burden estimates and standard errors by year in Exhibit 21 in the Appendix.

8 Though growth in healthcare spending burden in Utah has a wide confidence interval, it is worth noting that the bottom of the confidence interval for burden growth in Utah is still higher than the top of the confidence intervals across all other states.

9 From 2016 to 2017 in California, age groups 20-29 and 30-39 experienced spending growth of 14 percent. Age groups 40-49 and 50-64 grew by 13 percent. Spending grew by 13 percent for female and 14 percent for male. Spending for different income quintile groups are: 13 percent (quintile 1 and 4), 12 percent (quintile 2 and 5), and 11 percent (quintile 3).

10 First, we separated major drugstore chains (such as CVS and Walgreens) from all other drugstores and pharmacies. We classified all transactions at major drugstore chains that are multiples of $5 up to $300 as drug spending based on the assumption that these transactions are co-pays for drugs. Second, among merchants that are not major drugstore chains, we further distinguished between mail-order pharmacies and independent pharmacies. We classified all transactions involving mail-order pharmacies as drug spending. Third, we separated independent pharmacies into two groups: merchants with at least 20 percent of their transactions having whole dollar amounts and merchants with less than 20 percent of transactions having whole dollar amounts. For independent pharmacies with at least 20 percent of their transactions having whole dollar amounts, we classified all transactions as drug spending, just as we treated mail-order pharmacies. For the independent pharmacies with less than 20 percent of their transactions having whole dollar amounts, we classified all whole dollar payments that are increments of $5 up to $300 as prescription drug spending, just as we did for major drugstore chains.

11 While the resulting weighted sample is representative of each state in terms of age and income, it still differs from the population along other dimensions. For example, it does not include the 7 percent of US households who are unbanked. In addition, our sample requirements will result in a bias toward people who primarily transact using card-based and electronic channels.

12 Since the ACS only tags heads of households but not heads of family, we created our own tag of heads of family in multi-family households by tagging the person with the maximum income or maximum age.

13 We calculate standard errors and 95 percent confidence intervals of all our estimates of means and ratios using a bootstrap method. We calculate relative standard errors (RSE) as standard error / estimate. If RSE > 0.5, we do not display the estimates due to large sampling error. If 0.3<=RSE<=0.5, we report the estimates with an asterix (*) to caution the lack of precision. If RSE < 0.3, we display the estimates without caution. This standard is adopted by referencing the Medical Expenditure Panel Survey (MEPS)'s precision guidelines.

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