



Tracking Virginia's Health Care Sector through 2019

Trends in the Commonwealth's Health Care Spending,
Employment, and Prices with Comparisons to the Nation

Corwin Rhyan
Matt Daly, PhD
George Miller, PhD
Paul Hughes-Crowick

Altarum Institute



SOLUTIONS TO ADVANCE HEALTH



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Acknowledgments and Contact

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Author Contact:

Corwin Rhyan, Senior Analyst, Center for Value in Health Care
Altarum Institute

Corwin.Rhyan@altarum.org



Report Highlights

VIRGINIA HEALTH SECTOR SPENDING

- Total Virginia health spending reached \$92.2 billion dollars in 2019, growing from \$89.4 billion in 2018 (an increase of 3.1%).
- Health spending per capita was \$10,800, about 7.1% lower than the national average, driven by lower spending per-capita on hospital and physician services.
- Health spending as a percent of state GDP was 16.8% in 2019 for Virginia, a percentage point lower than the national average of 17.8%.
- Overall health spending growth rates in Virginia have averaged 4.5% since 2015, lower than the national average 4.8%. Average hospital spending growth (3.6%) was the lowest among the major categories in Virginia over this period, while prescription drug spending growth was the highest (7.3%).
- The largest payer of health care services and products in Virginia in 2019 is private health insurance (\$25.7 billion), followed by Medicare (\$16.9 billion), and then Medicaid (\$9.7 billion). Medicaid spending is expected to grow due to Medicaid expansion in 2019.

VIRGINIA HEALTH SECTOR EMPLOYMENT

- In the fourth quarter of 2019, 378,000 individuals were employed by the health care sector in Virginia, about 11.2% of the total private sector employed population.
- About 50% worked in ambulatory care settings, 29% in hospital settings, and 21% in nursing home and residential care settings.
- Health sector jobs have grown slightly faster than non-health sector jobs since 2015 (2.2% year-over-year growth for the health sector vs. 1.4% for all nonfarm employment).
- Health sector job growth among ambulatory care settings in Virginia has been the fastest since 2015, at 3.2% year over year, versus hospital and nursing home settings growing at an average rate of 1.2% and 1.3% respectively.
- A slightly smaller percentage of private sector workers in Virginia are employed by the health care sector compared to the national average (12.7%).

VIRGINIA PRIVATE HEALTH INSURANCE COSTS

- For individuals with health insurance coverage through a private sector employer, the average single premium in 2019 was \$6,800 and the average family premium was \$19,900.
- These annual premiums are slightly less than national averages (2.8% and 3.0%, respectively), but not as low as might be expected given that underlying health expenditures per capita in Virginia are 7.1% below the national average.
- Since 2008, per enrollee private insurance personal health care spending has increased by 42.7%, while single annual premiums have increased 61.3%, and family premiums have increased 66.4%. Deductibles and other cost sharing have also increased over this period.



Report Overview and Data Sources

This report summarizes the major findings of a comprehensive analysis of health sector trends for the Commonwealth of Virginia, including assessments of health care spending, employment, and prices. Incorporating data from the Center for Medicare & Medicaid Services (CMS) National and State Health Expenditure Accounts (NHEA) with data from the Bureau of Economic Analysis, Bureau of Labor Statistics, the United States Census Bureau, and data from the Commonwealth's own All-Payer Claims Database (alongside a variety of other public data sources), these findings provide the best possible up-to-date estimates of critical health sector metrics, while placing these data in context with national health sector trends.

The data in this health sector spending report benchmark to and build upon CMS National Health Expenditure Data, specifically information by State of Residence on personal health care spending by major component category (such as Physicians, Hospitals, and Prescription Drugs) and payer (such as Medicare, Medicaid, and Private Health Insurance) for the Commonwealth. These state-level data, while comprehensive, trusted by experts, and somewhat routinely updated, lag significantly behind the national-level CMS NHEA data. At the time of this report's publication, state-level data are only available through the year 2014 and not expected to be updated for another year.

As a result, this report incorporates other health sector spending data to produce estimates of Virginia health spending trends through 2019. These additional data sources include: Virginia Health Information's All-Payer Claims Database (APCD), from which we used data on Medicaid and commercial health insurance claims; CMS Medicare Geographic Variation Public Use Files on Medicare spending; CMS Form-64 data on state Medicaid expenditures; and Bureau of Economic Analysis state-level Personal Consumption Expenditures and Income for the health sector. We used these data, blended together and combined with data on health insurance enrollment statistics from the American Community Survey and official CMS Medicare and Medicaid enrollment files, to estimate by component and payer Virginia health spending trends through 2019. We designed these estimates to benchmark to the existing CMS state-level health spending data, while extending those data through the most recent period available.

Virginia Health Information's APCD, specifically data from the years 2014-2019, is a major source for the health spending metrics derived and estimated for this work. Some spending metrics in this report for Virginia contain data only through the third quarter of 2019, as APCD enrollment and spending data showed significant declines in the final months of 2019, likely as a result of not-yet-submitted or finalized data from all contributors to the APCD. Data for the APCD, while expected to encompass all Medicaid enrollment and claims within the Commonwealth, are not necessarily comprehensive for those with private health insurance. As a result, we incorporated APCD metrics based on per-enrollee spending for each period and category of spending and then standardized to be representative of the Commonwealth's overall privately insured population. More detail on this approach is available in the methods section.



Additional state and national data from Altarum's Health Sector Economic Indicators (HSEI) and Virginia macroeconomic data from the Bureau of Economic analysis are also included in this report, providing context for Virginia's health spending trends relative to national averages. This report's data inputs include a mixture of monthly, quarterly, and annual data depending on the underlying source. Where necessary, we combined or averaged monthly and quarterly data estimate metrics over longer time periods and decomposed annual data into quarterly trends using cubic-splines to estimate shorter time periods.

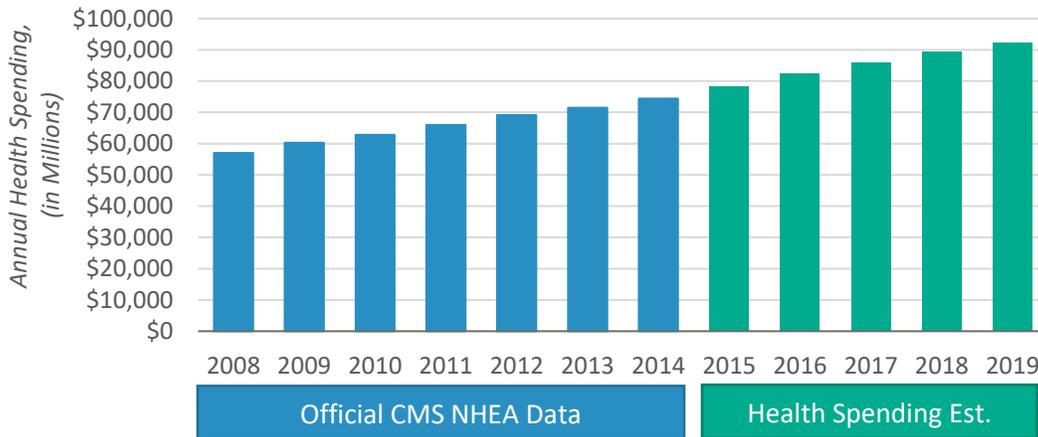
For this report's estimates of Virginia health sector employment trends, we collected and processed data from the Bureau of Labor Statistics State and Metro Area Employment. While these data are current, providing monthly estimates of health sector employment trends for the Commonwealth through the end of 2019, the detail of the labor categories available at the state-level are limited compared to the national data. Major categories available at the state level include total health care employment, ambulatory health care centers employment, hospital employment, and nursing home and residential care employment. We compare trends among these categories and the proportion of overall employment covered by the health sector against national data.

We tabulated data on private sector health insurance premiums based on the results of the Agency for Health Research and Quality's (AHRQ) Medical Expenditure Panel Survey—Insurance/Employer Component (MEPS-IC). These data track and allow for the comparison of private health insurance premiums for individuals with coverage from a private sector employer across the US and for specific states. We collected data for Virginia from the MEPSnet/IC Query tool, which was recently updated with cost data through the year 2019. Data are reported separately for those with single and family coverage. We analyze trends in total premium costs (employer and employee components combined) and include separately the average deductibles for these plans for some analyses. We collected additional data on insurance coverage purchased directly by individuals (not through an employer) from the Healthcare.gov marketplace, specifically trends in the state's average "benchmark" premium—the second lowest cost silver plan for a 40-year-old. These data are compiled by the Kaiser Family Foundation and made publicly available.



Virginia Health Sector Spending – Major Findings

Figure 1: Virginia Annual Health Care Spending, in Millions



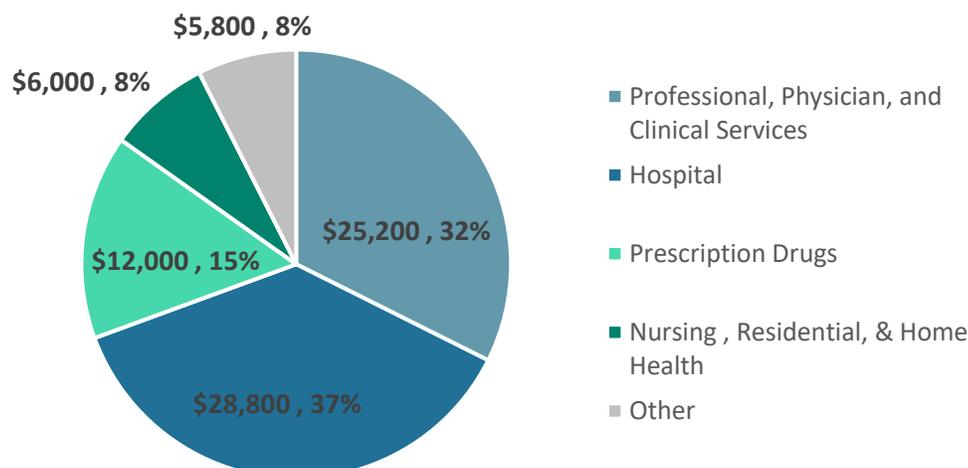
We estimate total Virginia health spending to have reached over \$92.2 billion dollars across the Commonwealth in 2019 (Figure 1), accounting for approximately \$10,800 per resident (Figure 2). Health expenditures have increased consistently year over year, growing to their current level from \$89.4 billion in 2018 and \$74.4 billion dollars in 2014, the last year for which official CMS NHEA state-level data are available. Of the \$92 billion dollars expended in the health sector during 2019, an estimated \$77.8 billion of that spending went towards Personal Health Care products and services, such as Professional and Clinical services, Hospital services, Nursing Home and Residential Services, Home Health Care, Prescription Drug products, and other Durable and Non-Durable medical equipment purchases. The remaining \$14.4 billion of estimated health sector spending in 2019 (breakdown not shown), is attributable to non-Personal Health Care spending, going towards components such as public health activities, investment, research and development, and the net cost of health insurance and government administration.

Figure 2: Average Health Spending Per-Capita, 2019





Figure 3: Virginia PHC Spending by Category (in Millions), 2019



Of the major Personal Health Care spending components, hospital services and professional, physician and clinical services are the two largest expenditure groupings, comprising \$28.8 billion and \$25.2 billion respectively and combined about 69% of all PHC expenditures (Figure 3). Prescription drug expenditures and nursing home and residential care services each comprise a smaller proportion of overall Virginia health care spending, at \$12 and \$6 billion dollars, respectively, in 2019. While smaller proportions of overall spending, these categories have also tended to have faster growth rates in recent periods, further discussed below.

Relative to the national average in 2019, annual health care spending per capita in Virginia is slightly below average, around \$10,800 per person compared to \$11,600 for the nation as a whole. Among the major spending components, Virginia spends slightly less per-capita on hospital services and professional/physician services when compared to the nation, while spending slightly more per-capita in 2019 on prescription drugs and nondurable products, \$1,400 per person versus \$1,300 per person (Figure 4). The largest percentage differences between Virginia per-capita spending and national averages are nursing, residential and home health care (18% less in Virginia), hospital services (12% less in Virginia) and prescription drug spending (7% greater in Virginia).

Figure 4: Table of Per-Capita Health Spending on Major Components, 2019

Health Spending Component	National Avg. Per-Capita Spend	Virginia Avg. Per-Capita Spend (% difference)
Professional, Physician, & Clinical Services	\$3,000	\$2,900 (-3%)
Hospital Services	\$3,800	\$3,400 (-12%)
Prescription Drugs	\$1,300	\$1,400 (+7%)
Nursing, Residential, & Home Health	\$900	\$700 (-18%)
Other Categories (including non-PHC spend)	\$2,600	\$2,400 (-9%)
Total	\$11,600	\$10,800 (-7%)



In addition to spending less per capita, Virginia’s health expenditures as a percentage of overall Gross Domestic Product (GDP) are less than the national average, 16.8% for the Commonwealth in Q3 2019 versus 17.8% across the United States (Figure 5). Virginia’s health spending as a percent of GDP has been consistently below the national average since 2008, and while increasing at a slightly greater rate from 2008 through 2015, has remained well below the national average through 2019 (Figure 5). If Virginia’s health care spending as a percent of GDP was the same as the national average, health expenditures in the Commonwealth would have instead exceeded \$99.5 billion dollars, over \$6.6 billion more than what was actually spent on health care products and services in 2019 (data not shown). Among the major categories, a lower hospital spending as a percent of state GDP is the largest savings contributor, followed by nursing home and residential care, and other personal health care categories. Lower hospital spending accounted for \$3.5 billion of the \$6.6 billion, nursing home care for \$1.2 billion, and net other categories \$1.9 billion.

Figure 5: Health Spending as a Percent of GDP

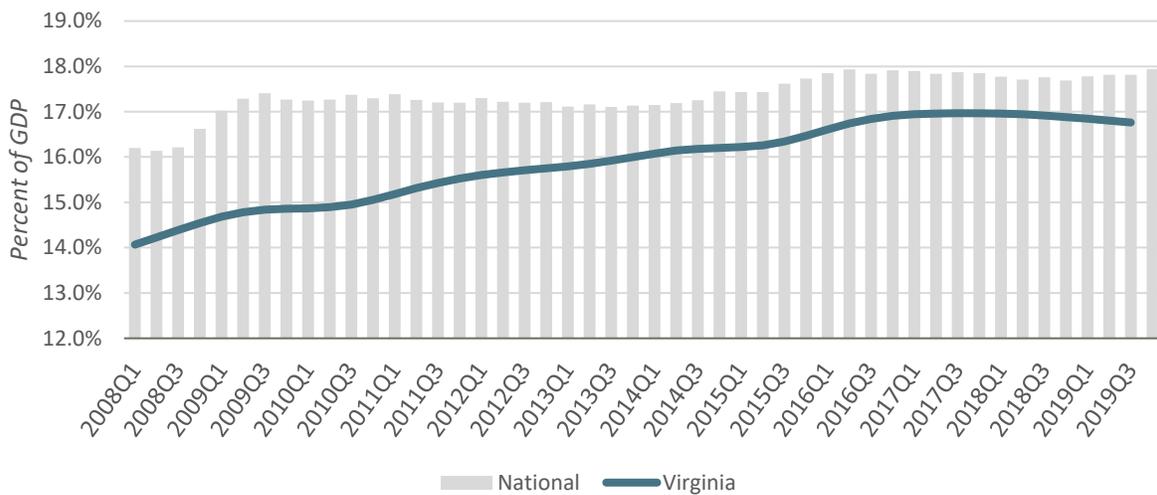
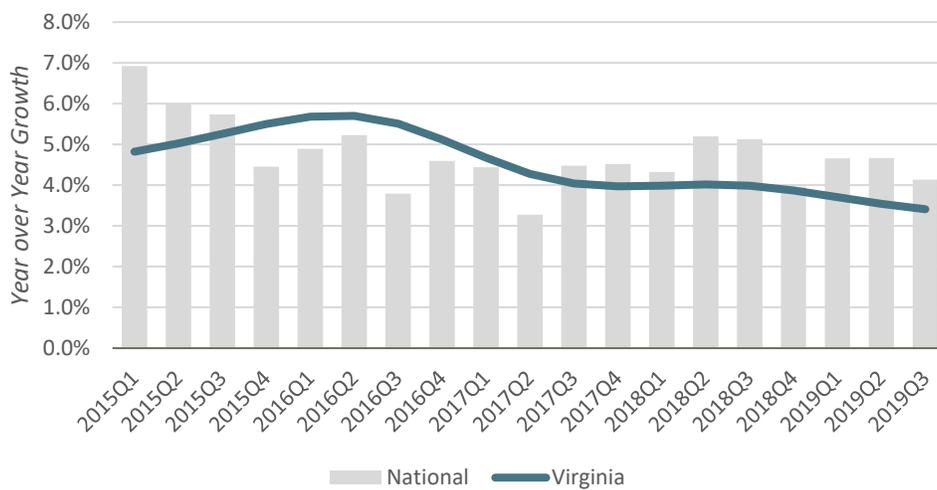


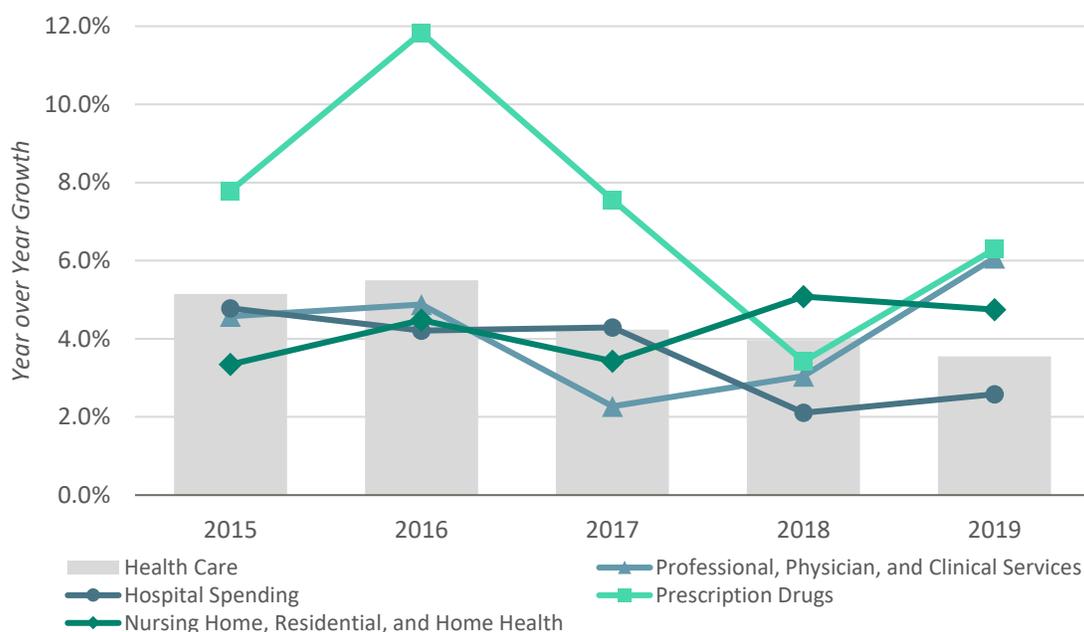
Figure 6: Year-over-Year Health Spending Growth





Overall year-over-year health spending growth rates in Virginia have averaged 4.5% since 2015, peaking at an average rate of 5.5% in 2016 and then slowing somewhat through the end of 2019 (Figure 6). This upward trajectory of health care spending is consistent with trends across the country, as nominal health care year-over-year spending growth in the U.S. has averaged about 4.8% since 2015. In recent years, Virginia health care spending growth has been slightly below the average trend, except for the year 2016. This slower growth has contributed to keeping overall Virginia health spending per-capita and as a percent of GDP below national averages.

Figure 7: Year-over-Year Health Spending Growth, by Major Category



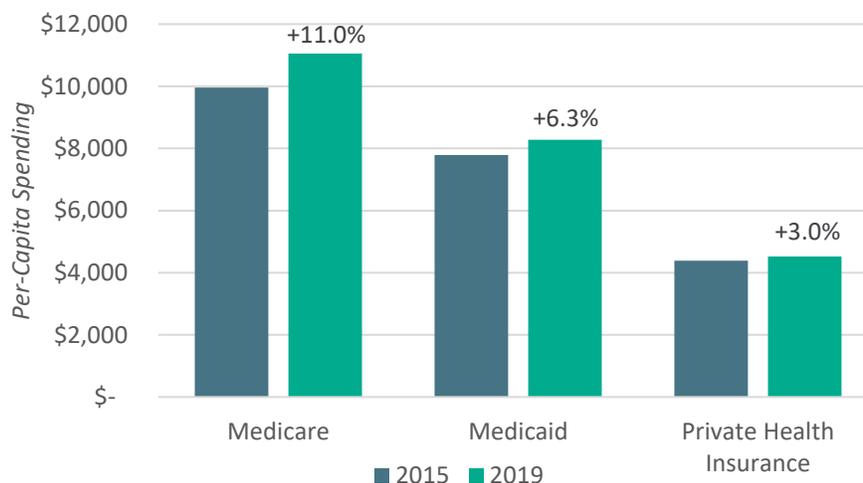
Over the period from 2015 to 2019, among the major spending components, spending on hospital services has grown at the slowest rate, 3.6% year over year; followed by professional, physician, and clinical services, at 4.1%, and Nursing Home and Residential care services at 4.2% (Figure 7). Spending growth on hospital services, already the lowest among the major categories, appears to have slowed even further in recent periods, growing by only 2.6% year over year in 2019 through the third quarter. Over the same period, professional, physician, and clinical services spending growth has accelerated slightly to 6.1% in 2019, the fastest since 2011 (some data not shown). Prescription drug spending growth is the fastest of the major categories for Virginia over this period, averaging 7.4% year over year from 2015 to 2019. The fastest year of growth for prescription drug spending was 2016, exceeding 11% growth during the year and much faster than the national growth rate for prescription drugs in that year (data not shown).

Comparing growth trends among these major spending components to the nation, Virginia's spending trends have diverged somewhat. Since 2015 for the nation, hospital spending was the fastest driver of health spending growth, averaging 5.3% year over year and pulling up the national overall health spending growth rate to 4.8% from 2015 to 2019 (data not shown). Conversely, Virginia's hospital spending over this period has been the slowest of the major categories.



Virginia's prescription drug spending growth over this period (7.3%) has shown the opposite trend, exceeding the national average year-over-year spending growth (4.3%). Nationally, prescription drug spending peaked earlier, in the year 2014, while Virginia's drug spending did not. National spending in 2014 rose dramatically due to new branded drug releases (such as the novel Hepatitis C treatments) as well as to being a period a relatively high price growth. Virginia's prescription drug spending peak appears to have been slightly delayed, peaking instead in the year 2016.

Figure 8: Virginia Per-Capita PHC Spending by Major Payer

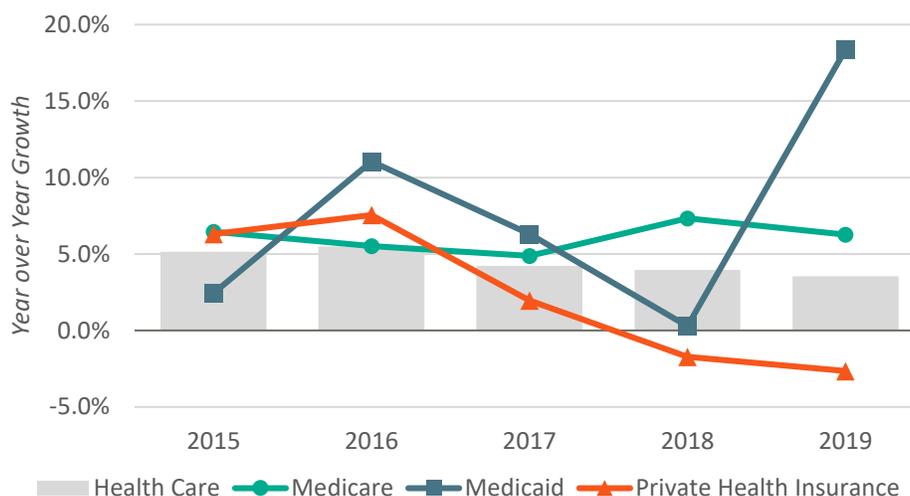


The largest payer for health care products and services in Virginia is private health insurance, spending an estimated \$25.7 billion on personal health care in 2019, followed by Medicare \$16.9 billion, and Medicaid \$9.7 billion. For 2019, this equates to about \$11,000 of personal health care spending per Medicare enrollee, \$8,300 per Medicaid enrollee, and \$4,500 per private health insurance enrollee (Figure 8; note this spending is estimated only for the personal health care spending component of total health expenditures, as this is the CMS NHEA state data standard). Since 2015 the rate of overall spending growth and spending growth per enrollee (Figures 8 and 9) has varied, but at times has been faster among public payers when compared to private payers. A major contributor to growth in overall Medicaid spending has been the expansion of Medicaid coverage in 2019, leading to an overall estimated growth in Medicaid spending for 2019 of 18.4%.

When compared to the national average in 2019, annual personal health care spending per enrollee in Virginia is below average for private insurance enrollees (\$4,500 vs. \$5,600) and Medicare enrollees (\$11,000 vs. \$12,400), and slightly higher for Medicaid enrollees (\$8,300 vs. \$7,600) (national data not shown). These differences in spending per enrollee between Virginia and the national average have been consistent since 2008, where private insurance spending and Medicare enrollee spending in Virginia have typically been below the national average. In addition to these three major payers, other sources of funds for health care services include other public payers (such as the Department of Veterans Affairs, Indian Health Service, and Department of Defense) and out-of-pocket spending.



Figure 9: Virginia Health Spending Year-over-Year Growth, by Major Payer



While the CMS state-level data do not explicitly track health spending from these other insurers or out-of-pocket spending, we were able to estimate the combined total for these sources based on the difference between total health spending and the amount paid by the three major insurance types. In 2019, this remainder amounts to 30% of health spending in Virginia. This proportion of personal health care paid from other sources is higher than the national proportion of spending not covered by the three major payers, which was around 15%. This gap may close over time as the rate of uninsured individuals drops in Virginia, as result of Medicaid expansion.

The dramatic rise in Medicaid spending growth for 2019 is entirely attributable to the larger Medicaid enrollment in the first year of Medicaid expansion for the Commonwealth. In 2019, there was an estimated average year-over-year enrollee expansion of 260,000 individuals, bringing the total to 1.3 million individuals (a 25.2% increase from the year prior). Conversely, the rate of spending per enrollee fell slightly, from \$8,500 per enrollee in 2018 to \$8,300 per enrollee in 2019. This could be due to the new expansion enrollees being slightly healthier than their traditional Medicaid counterparts, or perhaps due to program efficiencies caused by the larger population served. If spending per enrollee had not fallen slightly in 2019, Medicaid spending growth would have been even greater.

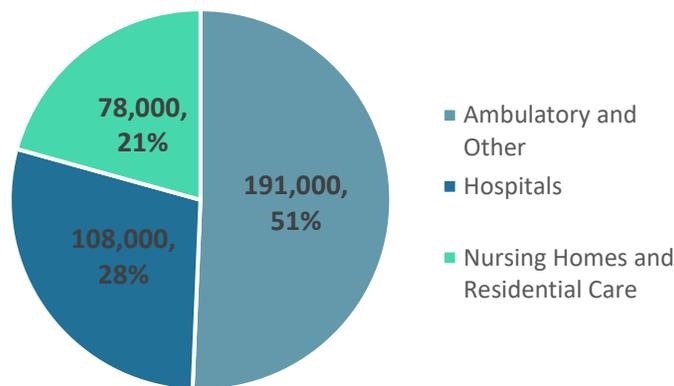
While the complete set of data sources required to estimate health spending metrics and trends for the year 2020 are not yet available for Virginia, we expect that health spending may actually decline when compared to 2019, primarily as a result of the COVID-19 pandemic and the resulting economic recession. National health spending saw significant declines during the spring and summer of 2020, and preliminary state GDP data components from the Bureau of Economic Analysis (only available for the entire health care and social assistance industry supersector through Q2 2020 at the time of writing), indicate that spending through the first half of 2020 in the Commonwealth was down by 6.4% compared to 2019. Spending in Virginia is expected to normalize for the remainder of 2020, but likely not to the point that overall annual health spending will show positive growth year over year.



Virginia Health Sector Employment – Major Findings

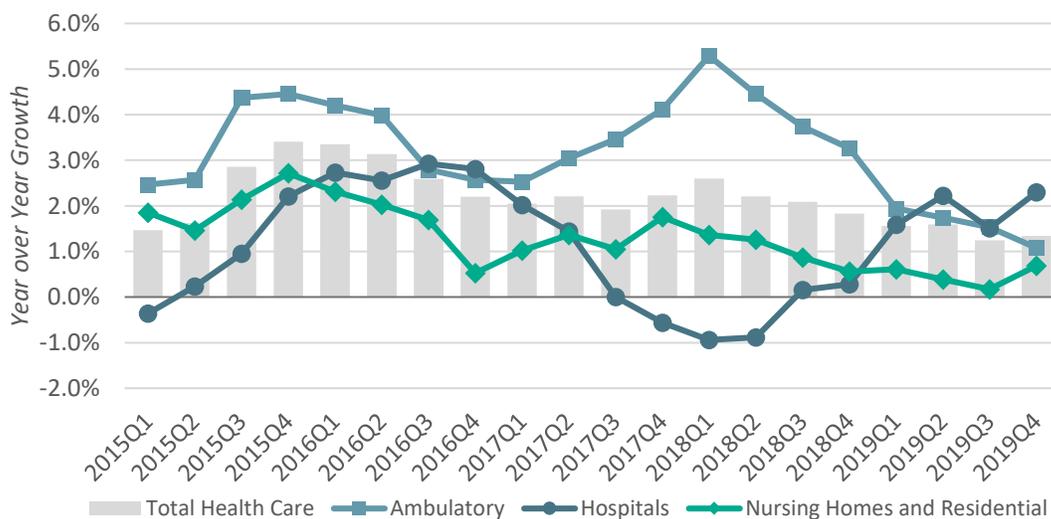
As of the fourth quarter of 2019 the Commonwealth’s private sector employed approximately 3.4 million Virginians with 377,000 or about 11.3% of that privately employed population working in the health sector. Health sector employees have increased over time, growing from 338,000 individuals in early 2015 to the current total. Among the 377,000 employees, 191,000 (50.5%) work in ambulatory care settings, 108,000 in hospital settings (28.7%), and 78,000 (20.7%) in nursing homes and residential care settings (Figure 10).

Figure 10: Virginia Health Sector Employment, Q4 2019



Compared to overall employment growth in Virginia, the health sector has expanded slightly faster, increasing the number of employed at an average year over year rate of 2.2% since 2015, compared to only 1.4% for all nonfarm employment (data not shown). As a result, the percentage of individuals working in the health sector has increased slightly over time, rising from 10.9% to 11.2% at the end of 2019.

Figure 11: Virginia Health Sector Employment Growth, by Major Category



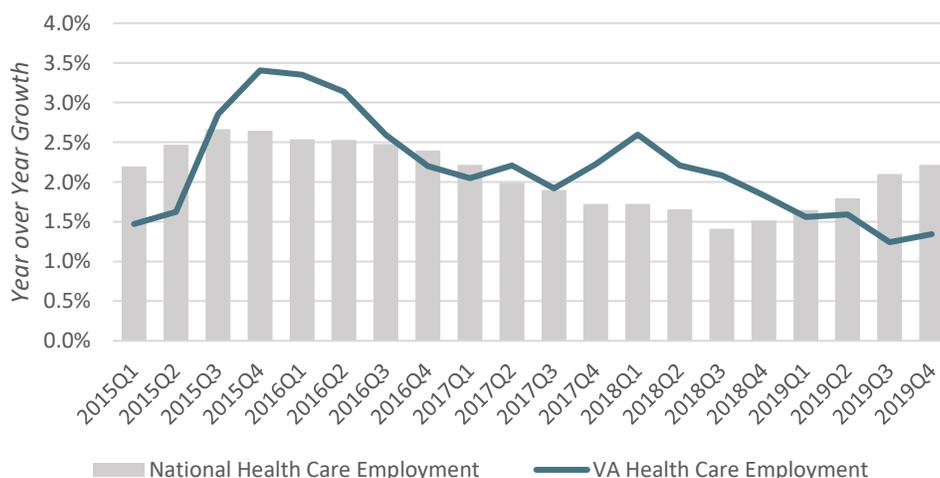


Growth in both overall and health sector employment has been relatively constant over the period from 2015 to 2019, with 2016 representing both the year of fastest growth for health sector employment and the greatest differential between health and non-health sector job growth. By the end of 2019, the pace of health sector job growth slowed slightly, falling below the overall Virginia employment growth rate for the period since early 2015. The intra-period trends in job growth have been broadly consistent with spending growth, peaking in the year 2016.

Among the major health care employment categories tracked at the state level, growth in ambulatory care settings has been fastest, averaging 3.2% growth year over year from 2015 through 2019. (Figure 11). Hospital and nursing and residential setting job growth has been comparatively slower, at 1.2% and 1.3%, respectively. Hospital employment in the Commonwealth even contracted slightly in late 2017 and early 2018, dipping into a negative year-over-year growth rate for three quarters. The faster growth in ambulatory settings is consistent with broader health sector trends, wherein the use of inpatient care has declined relative to outpatient and ambulatory settings.

Relative to the national average, the percentage of Virginians employed by the health sector is smaller at 9.2% in 2019 versus 10.8% for the nation as a whole. As a proportion of all workers, Virginia's private sector is slightly smaller than the national average (due to a higher percentage of federal and state government employees in the Commonwealth), therefore, as a percent of the private sector, the gap in the percent of health workers employed by Virginia is somewhat smaller at 11.3%, versus 12.7% for the nation.

Figure 12: Health Sector Employment Year-over-Year Growth



The overall average growth of Virginia's health sector employment between 2015 and 2019 was just slightly faster than the nation at 2.2% (vs. 2.1%) (Figure 12). The mix of health sector employment across the country is also moderately different: while the percentage of employees in nursing home and residential care settings is similar, the proportion of national health sector workers in hospital settings nationwide (31.9%) is greater than the proportion of hospital employees in Virginia (28.7%) (national data not shown). The inverse is true of ambulatory care



settings, where the proportion of workers nationwide is smaller (47.5%) than Virginia (50.5%). Crudely comparing productivity and output per worker (based on the total amount of health spending per employee by setting), we find that Virginia's hospital employees have a slightly greater output per worker compared to the national average, with the inverse true for those in ambulatory care settings (data not shown).

Similar to health care spending, there have been significant declines in employment across all sectors and regions in 2020 as a result of the COVID-19 pandemic. While many jobs in the health sector have recovered, overall sector employment remains below 2019 peaks and we expect the same is true in Virginia. While some ambulatory settings, such as offices of dentists saw dramatic temporary drops (up to 50%) in the spring of 2020, many settings have nearly recovered, while others, such as nursing home and residential care settings have slowly declined and have yet to show signs of returning to pre-2020 employment levels. We expect these employment changes, driven by changes in health service utilization, will continue into at least the year 2021.

Virginia Private Health Insurance Costs – Major Findings

As highlighted above, both overall health care spending per capita and private health insurance personal health care spending per enrollee are lower in Virginia when compared to the national average. Virginia health spending per capita in 2019 is approximately \$800 less than the national average (\$10,800 vs. \$11,600) and private health insurance spending on personal health care products and services is an estimated \$1,100 less (\$5,600 vs. \$4,500). We find a similar trend in many of the underlying health expenditure categories. Over recent periods, the growth in these components has been relatively similar to national trends, with year over year growth in the Commonwealth slightly lower than the national average since 2015.

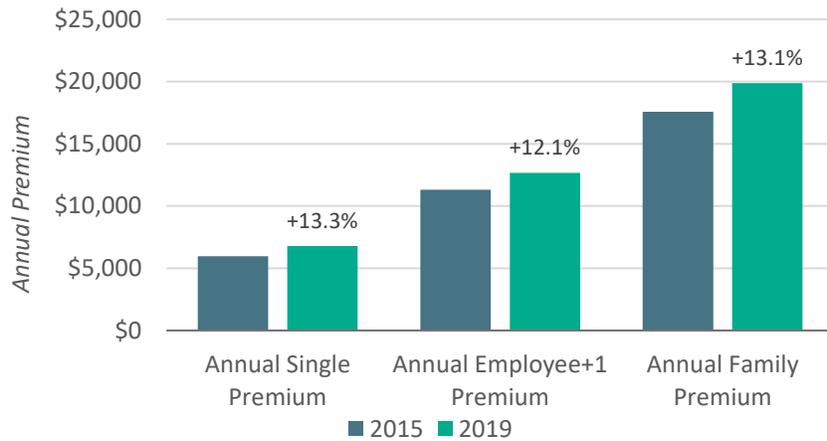
Personal health care spending and expenditure data assess differences in underlying health care costs and measure expenditures that go towards health care products and services. However, another component of health care spending is the relative cost of insurance premiums. Data on insurance premiums for those with coverage from a private-sector employer and those that purchase insurance directly on the insurance exchange show that payments to insurers for coverage are also slightly less in the Commonwealth relative to the national average. However, the premium differences between Virginia and the US are much smaller than actual health expenditure variation. For individuals with single coverage from a private-sector employer, annual average premiums were \$6,800, only \$200 less than the national average of \$7,000. For those with family plans, annual premiums from a private-sector employer were \$19,900 compared to \$20,500 nationally, a \$600 difference.

We find that this trend continues when analyzing data on coverage purchased directly from a health insurer on the public exchange. Using data on the average benchmark premiums across the



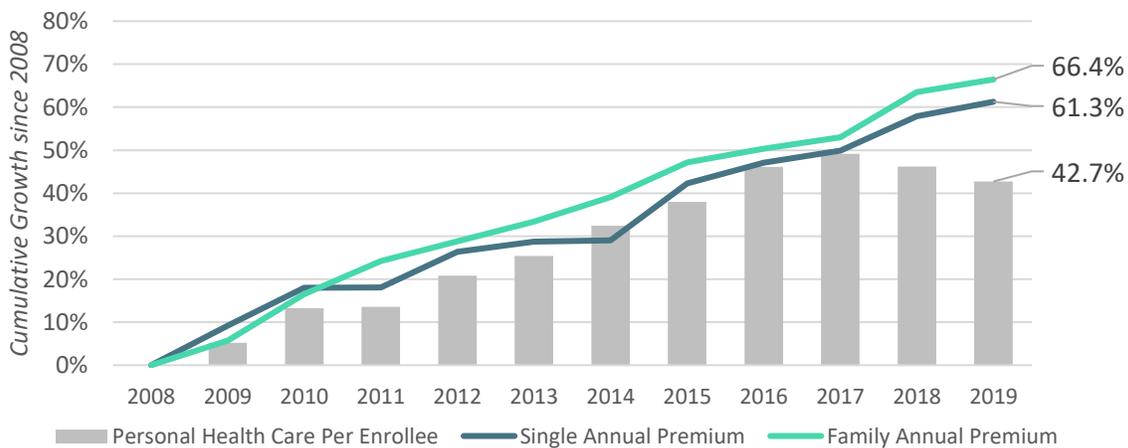
state, insurance costs are actually higher in Virginia, with an average individual annual premium of \$6,400 versus \$5,800 across the US. Data on 2020 benchmark premiums in Virginia show insurance costs may have decreased slightly, but remain well above the national average, despite lower average spending per capita on health care.

Figure 13: Virginia Private-Sector Employee Annual Health Insurance Premiums



Relative to the differences above in underlying health care expenditures, this indicates health insurance premiums in the Commonwealth are more expensive than the national average. Private-sector single coverage premiums are 2.8% lower and family plan premiums are 3.0% less in 2019, yet the underlying Commonwealth personal health care expenditure data indicate health product and service expenditures are 6.6% lower per capita, and since 2015 private health insurance spending on personal health care per enrollee was more than 10% lower than the national average. This difference is highlighted in the faster rates of growth since 2015 for all major private sector health insurance plan premiums—Single, Employee+1 and Family plan variants (Figure 13), when compared to underlying growth in spending (Figure 8).

Figure 14: Cumulative Growth in Private Insurance Personal Health Care Expenditures, Single Premiums, and Family Premiums, Virginia, 2008-2019





When looking at the impact of these growth differences over a longer period, it is clear that, for Virginia, the cumulative growth in both single and family annual premiums have outpaced underlying spending on personal health care services by private insurance. Since 2008, personal health care expenditures per private insurance enrollee are up by 42.7%, while the premiums for single coverage of a private-sector employee are up 61.3%, and family premiums are 66.4% higher (Figure 14). Furthermore, over this period, other types of cost sharing have also increased—average deductibles are substantially higher as are many types of co-payments for specific services. If the annual deductible were added to each of the single and family plan annual premiums, total plan costs would be 70.8% and 72.3% higher, respectively, in 2019 (data not shown). Cumulative growth in benchmark marketplace premium costs for those purchasing insurance on the public exchange have also increased substantially but have not been available for the entire period since 2008 and have also experienced much greater year-over-year variability.

Private sector premium costs are generally split between enrollees and employers, while deductibles and cost sharing are typically the responsibility of individual. On the marketplace, many individuals receive subsidies from the federal government to help pay for premiums and sometimes reduce the size of their cost sharing. Just as the COVID-19 pandemic has impacted health spending and employment trends in 2020, it has also affected health insurers planning their premiums in the upcoming year. While utilization fell dramatically over the summer, it has slowly returned closer to pre-pandemic norms. It is still unclear if the averted care from the spring will be made up in future periods, resulting in accelerated health spending growth, or if the forgone spending will be permanent. Also unknown are the upcoming possible costs associated with COVID-19 vaccines, prevention, or new treatments. Therefore, future drivers of insurance costs are mixed and the net result is unknown. Upcoming premiums are not likely to significantly deviate from typical growth rates for upcoming periods, while it remains to be seen if more rebates will be sent out to ensure compliance with Medical Loss Ratio (MLR) limits.



Appendix A: Report Methodology

VIRGINIA HEALTH SECTOR SPENDING

CMS National Health Expenditure Accounts Benchmarking

Analyses in this report follow the spirit and strategy of Altarum's national-level [Health Sector Economic Indicators](#) (HSEI) briefs and data, while bringing these techniques to the state level for a novel analysis of health sector trends in Virginia. HSEI spending analyses are designed to provide the most up-to-date possible estimates of health expenditures that are consistent with and build upon the CMS [National Health Expenditure Accounts](#) (NHEA). Among health economists and health sector experts, these data are among the most frequently cited and most trusted estimates of health sector spending and provide robust, consistent, and understandable estimates of health sector expenditure trends. The NHEA accounts contain data at the national level (updated annually) and state level (updated every 4 or 5 years), data by payer, data by spending category, and data for specific demographic groups (age and gender). Also included in the NHEA are projections of future health national health sector expenditures, which are updated annually. Yet, despite their reliability, official NHEA data suffer from significant data lags in the release of this information, particularly at the state level (the most recent data at the time of writing are only available through the year 2014).

Therefore, this work directly incorporates and benchmarks to CMS NHEA data whenever it is available, and then subsequently builds on those data to generate estimates of spending for periods that are not yet available in the NHEA data: in this report the quarterly data for the years 2015 to 2019. When subsequent releases of NHEA data become available, this approach makes it possible to re-benchmark our findings for the years provided and continue estimating for new periods not yet available from CMS. All category definitions, populations, and spending estimates in this report match directly to the CMS definitions used in the NHEA. Details on the NHEA methodology and how it compares to other health sector spending estimates, for example those in GDP accounting, is [available on the NHEA homepage](#). In the case of the state health spending trends, we benchmark to the data available from 2008 through 2014 in the state-level NHEA accounts, using data on total spending by health category, spending by payer, and spending per enrollee for each of the three major insurance type. Data on state health spending trends come in two variants, based on residence and provider location, we use [data by residence](#) as the source for this report.

In some cases, data from CMS (which are reported annually), need to be portioned into quarterly or monthly estimates to support the estimates of future periods and to ensure consistent reporting over time. In the national level HSEI, within year trends are estimated using the underlying health spending estimates from Bureau of Economic Analysis (BEA) [National Income and Product Accounts](#) (NIPA) data, while splined to ensure that the national annual HSEI totals match with the CMS NHEA totals. In the state level work, we follow a similar approach, yet often do not have the same historical data in our underlying series to generate intra-year trends.



Therefore, in this work we instead use a [simple cubic spline](#) for intra-year trends of the state-level CMS total spending, spending by category, and spending by payer data from 2008 to 2014. As a result, averages of quarterly data in the final workbooks may differ very slightly from the annual data reported by CMS, due to the cubic spline methodology. Generally, our approach is to report on annualized data, which estimates spending quarterly based on what an annual total of spending would be for that period if it continued for an entire year.

In order to estimate future periods of data, while benchmarking to the CMS NHEA state-level data through 2014, we use the same approach in this work as is employed in the national-level HSEI analyses. We calculate from other data year-over-year growth rates for subsequent periods in categories and series that are comparable to the official NHEA statistics. For example, data from the [Virginia APCD](#) and data from [state-level GDP and NIPA](#) sources are used to calculate year over year growth rates and those are then applied directly to the base year (2014) CMS NHEA estimates. This approach is done separately and independently for total state spending category spending, spending by payer, and enrollment by payer. This approach ensures that future period estimates are consistent with the CMS NHEA data and that there are not discontinuities between the official CMS NHEA data and the more recent periods in this report and the underlying data. We specifically highlight this in [Figure 1](#) of this report, showing the official and estimated periods in different colors.

Some estimates of health expenditures that are available at the national level are not available in the CMS state-level data (or differ slightly from the national data). For example, State NHEA data does not include estimates of spending beyond personal health care expenditures (PHC), nor do they directly contain estimates of total spending or spending per enrollee from minor insurance types (like military health systems or the Indian Health Service) or for the uninsured. Generally, when CMS spending data are not available to be used as benchmarks, we do not include estimates of those components in this report. The exception to that is our estimate of total health expenditures for the state of Virginia (in addition to the PHC expenditure data). We estimate this data by applying the ratio of national total health spending to national PHC expenditures to the state level estimates of PHC to estimate state-level total health spending. This statistic is then used in our comparison of total health spending as a percent of GDP nationally to the health spending as a percent of state GDP.

The benchmarking approach discussed above also applies to estimates of enrollment by major insurance types in the state, using CMS data through 2014. We attempt to remain consistent with NHEA population data, including the way that individuals are reported with multiple insurance types, and do not specifically report on the number of individuals uninsured at the state level. Details on data used to estimate enrollment in subsequent periods is described below, primarily relying on US Census American Community Survey data.

Population and Health Insurance Enrollment Estimates

Data used to estimate enrollment by insurance type in Virginia for the periods of 2015 to 2019 incorporate data from the US Census American Community Survey (ACS) and official Medicaid enrollment data. 1-year ACS [Public Use Microdata Sample data](#) were downloaded and processed



for each of the five years, and questions on health insurance enrollment during those years were used for individuals residing in the state of Virginia. When estimating year over year growth rates for the privately-insured and those with Medicare using the ACS data (that were then applied to the benchmark CMS data described above), we counted all individuals reporting each insurance type in their survey responses as enrollees, even when an individual reported more than one type of insurance in the year. This approach, rather than using a hierarchical structure of insurance definitions to choose one primary insurance type for each individual resulted in smoother year over year growth trends. Note that this approach does not double-count enrollees, because only the growth rate from ACS is applied to the benchmark CMS enrollment data. Individuals with private insurance include both those that reported receiving insurance directly from their employer and those who purchased insurance directly from an insurance company during the year.

For Medicaid enrollment, we used [data on enrollment by state](#) from the Kaiser Family Foundation, again applying the year over year growth rate from this data to the benchmark CMS NHEA Medicaid enrollment counts. This yielded what we believe to be a more accurate count of Medicaid enrollment growth statistic, particularly for the year 2019, where enrollment expanded greatly due to the state passing Medicaid expansion in the prior year.

Private Health Insurance Personal Health Care (PHC) Spending Estimates

Total health spending and spending per enrollee for those with private health insurance in this report benchmark to CMS NHEA estimates of spending from private health insurance sources. The primary data source used to build on the CMS NHEA data (which end in the year 2014) are data on private health insurance spending captured in medical claims contained within the Virginia [All-Payer Claims Database](#). Importantly, we use this data only in combination with the enrollment data described above to estimate trends in health sector private insurance spending. We do this by estimating trends in the APCD for health spending per private insurance enrollee over time and then multiply this data on spending per enrollee by the enrollment data from ACS above to estimate total year over year growth trends for Virginia's private health insurance funded spending. Spending per enrollee is calculated from the APCD on a monthly basis based on data using the sum of health expenditures in the four major claim types (Inpatient-IP, Outpatient-OP, Prescription Drug-RX, and Professional-PB) and then dividing by the number of enrollees in that month in the APCD enrollment tables.

We use this approach to incorporate the APCD data into our health spending estimates, rather than simply using total spending from private insurers directly from the APCD because the APCD does not cover all individuals with private insurance in Virginia. Those covered by a self-insured employer are potentially missing from this data, due to the fact that those entities are not required to submit their claims to the APCD. This is particularly an issue during periods following March 2016, when the [Gobeille v. Liberty Mutual Insurance Co.](#) case was decided by the US Supreme Court. Moreover, the number of submitters and enrollees covered by the APCD are not consistent over time. Therefore, the approach of using monthly computations of total spending and enrollment compensates for changes in enrollment over the year and also for potential loss of submitters over time in a way that does not bias our estimates of total spending. Of particular note



is the final period of 2019, where significant drops in total spending and enrollment were observed. We believe this was due to data that had not yet been submitted and processed by the APCD at the time of writing. As a result, insufficient data were available in the final quarter to estimate per enrollee spending averages for Q4 2019.

The monthly data on per enrollee spending were then combined via averaging into quarterly data and annual data and applied to the enrollment counts discussed in the prior section to estimate total spending. Some monthly data series derived from the APCD, such as commercial prescription drug spending in later periods, required smoothing to estimate year over year spending growth trends, where necessary this was done using an 18-month trailing average.

Medicaid Personal Health Care (PHC) Spending Estimates

An identical approach to the one used in the private insurance personal health care spending data was applied to estimate spending by Medicaid in Virginia for the periods building on the 2014 CMS benchmark data. Although the concerns about total spending computed in the APCD for Medicaid are less significant, because it is likely all Medicaid enrollees are covered by the APCD submitters (unlike those with private insurance), we chose to use the same approach to ensure consistency between the Medicaid and private health insurance methodology. However for Medicaid, an additional step was taken to also include additionally available data on spending trends from [CMS State Expenditure Reporting for Medicaid & CHIP](#) data collected via CMS-64 forms for each state. We believe that this data, which measures trends in total spending by the Virginia Medicaid program in each state over time is also likely to be strongly predictive of the official CMS reported health sector spending (separately from the underlying claims data reported to the APCD).

Therefore, to estimate final Medicaid PHC spending and spending per enrollee, we blend two separate estimates of Virginia Medicaid spending over time, one generated from the APCD approach described above and one directly from estimates in spending growth by the Medicaid program from the Form-64 data. These data are blended by computing annual growth rates and then using a simple average of the two approaches to estimate Virginia health spending from the NHEA 2014 benchmark year.

Medicare Personal Health Care (PHC) Spending Estimates

Estimates of total personal health care expenditures for Medicare differ from the above approaches, due to the fact that comprehensive Medicare claims were not available in the APCD for all necessary time periods at the time of analysis. We therefore use data from CMS directly in the Medicare [Geographic Variation Public Use File](#) to estimate per enrollee spending trends for Virginia and multiply those data with the enrollment counts from the ACS to estimate year over year growth in Medicare spending. This year over year growth is then applied to the 2014 base year CMS NHEA data. The Geographic Variation public use file is the same source that is used to power the CMS State [Geographic Variation Dashboard](#) on Medicare spending trends for the following types of care: Inpatient, Post-Acute, Hospice, Physician/OPD/Tests/Imaging/Durable Medical Equipment/Part B Drug/Ambulance. Of note, missing in this data are trends in retail prescription drug spending that is typically covered through Medicare Part D, but is included in



NHEA Medicare spending estimates. Therefore, added to the overall spending growth trend for Medicare PHC is data from the [Medicare Part D Provider Utilization and Payment Data: Part D Prescriber](#) file. Year over year growth rates in spending for the state are incorporated and blended with the above estimate to produce a total estimate of spending growth for Medicare expenditures.

Spending by Personal Health Care Category

Independent of the spending estimates by payer, we also estimate spending by the major NHEA health expenditure categories for Virginia, including physician and professional services, hospital services, nursing home and residential care services, and prescription drug expenditures. These results by category are generated using the underlying year over year growth trends in the data for each payer attributable to each NHEA category (and mixed using weighted averages, weighted by the enrollment in each insurance type). The categories in the underlying data are attributed in varying ways, depending on the category and data source. For example, data from the APCD for private insurance and Medicaid are attributed based on claim type (Inpatient claims attributed to hospital spending, Professional Claims to physician and clinical spending, and Prescription Drug claims to prescription drug spending) and data from the Medicaid Form-64 data are attributed based on the category of spending listed. The overall state of Virginia growth rate from these combined data for each category is then applied to the base year (2014) CMS NHEA spending by category to calculate the 2015 thru 2019 spending estimates.

Also incorporated into the health spending category estimates are data from BEA [state-level personal income data](#) for the following settings: hospitals, nursing and residential, and ambulatory services. A simple average is used to combine the year over year growth rate estimate derived from the state-level BEA data and the data directly from the APCD, Medicaid, and Medicare sources. The blended growth rate is then applied to the CMS NHEA data. Details on the differences between spending category estimates derived from the blended payer data and growth estimated directly from the BEA personal income data are available upon request.

Lastly, to generate estimates of total PHC expenditures for the state for 2015 through 2019, data on growth in spending for those not covered by the major three insurance types was required. An estimate of this aggregate PHC spending was computed directly from Virginia [personal consumption expenditure data](#) for health care services and then blended with the data described above on the three major payers. This “other” category is used to estimate spending both from other sources and on categories not described above.

VIRGINIA HEALTH SECTOR EMPLOYMENT

Data on health care employment is taken directly from the Bureau of Labor Statistics (BLS) [Current Employment Statistics](#) (CES) data for Virginia. These data are available directly for all categories used in this report. Monthly data are collected and then combined via an average to generate quarterly and annual data. State-level data are only available in the “Not Seasonally Adjusted” data series; however, this has a minimal impact, as seasonal trends in health care employment are very slight. Health employment as a percent of total employment is calculated in



two ways (described in the report), using both a base of total nonfarm employment and total private sector employment (also not seasonally adjusted). The difference in these two series is that private sector employment excludes those employed by public state and federal government entities.

VIRGINIA PRIVATE HEALTH INSURANCE COSTS

Data on private employer health insurance premiums are calculated based on the Agency for Health Research and Quality's (AHRQ) [Medical Expenditure Panel Survey— Insurance/Employer Component](#) (MEPS-IC). These data track and allow for the comparison of private health insurance premiums and plan characteristics, such as deductibles, for individuals with coverage from a private sector employer across the US and for specific states. The data were curated using the [MEPSnet/IC Trend Query](#) online portal, and data for private-sector establishments were taken for Virginia to include all plan types (single, family, and employee+1) separately, all provider types (HMO, PPO, any-provider plans) combined, for all firm types combined, and all firm sizes combined for the Commonwealth. Comparable data for national premiums and deductibles were obtained using the same approach.

We collected additional data on insurance coverage purchased directly by individuals (not through an employer) from the Healthcare.gov marketplace, specifically trends in the state's average "benchmark" premium—the second lowest cost silver plan for a 40-year-old. These data are compiled by the Kaiser Family Foundation and made publicly available in the [State Health Facts: Marketplace Average Benchmark Premiums tables](#).

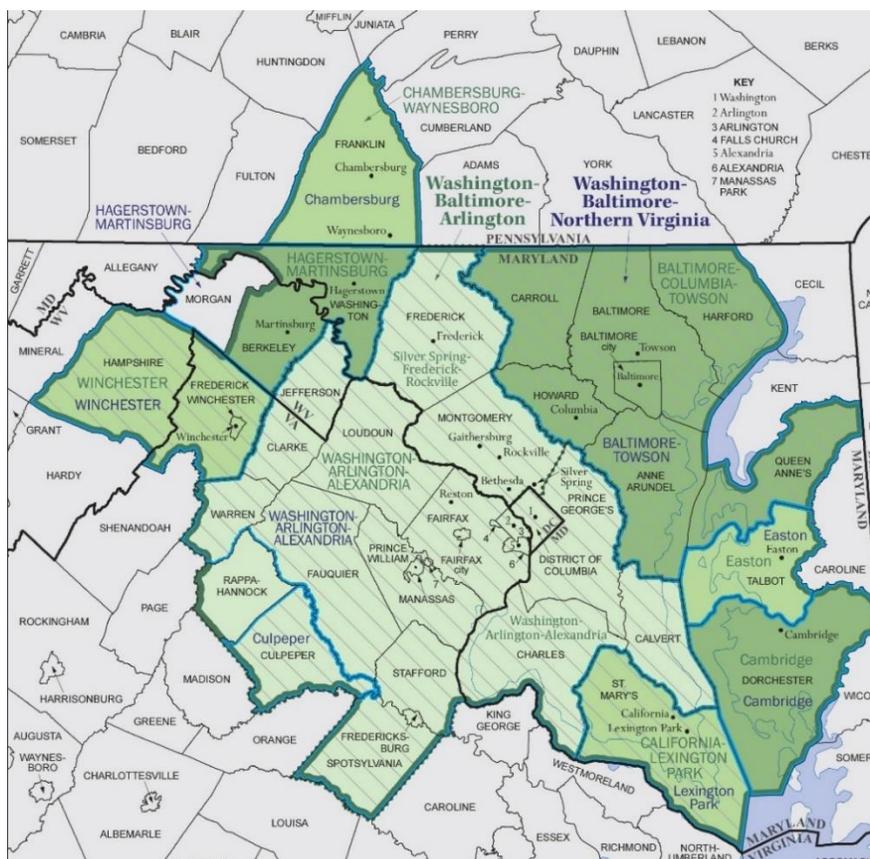


Appendix B: Regional Health Care Prices

This appendix contains Virginia health sector price trends using data from the Bureau of Labor Statistics, via Consumer Price Index data that are collected to be representative of large metro areas across the country. Altarum's national health sector price indexes incorporate detailed estimates of price growth for a variety of health sector products and services (including consumer and producer price indices), blending them to be representative of CMS NHEA definitions of health sector price growth. This section is limited in its analysis to the medical care consumer price indexes, which are available in subnational detail.

Health sector prices available from the Bureau of Labor Statistics for subnational regions are limited in both the number of industry/product categories and specificity of geographic area available. Geographies available for analysis that are nearest to the Commonwealth of Virginia are either the large South Atlantic Census Division (incorporating the states of Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia) or a smaller metro area, specially surrounding Washington, DC. This area is defined by the Washington-Arlington-Alexandria, DC-VA-MD-WV core based statistical area (CBSA). A map of the CBSA made available from the US Census Bureau is shown below in Figure B1.

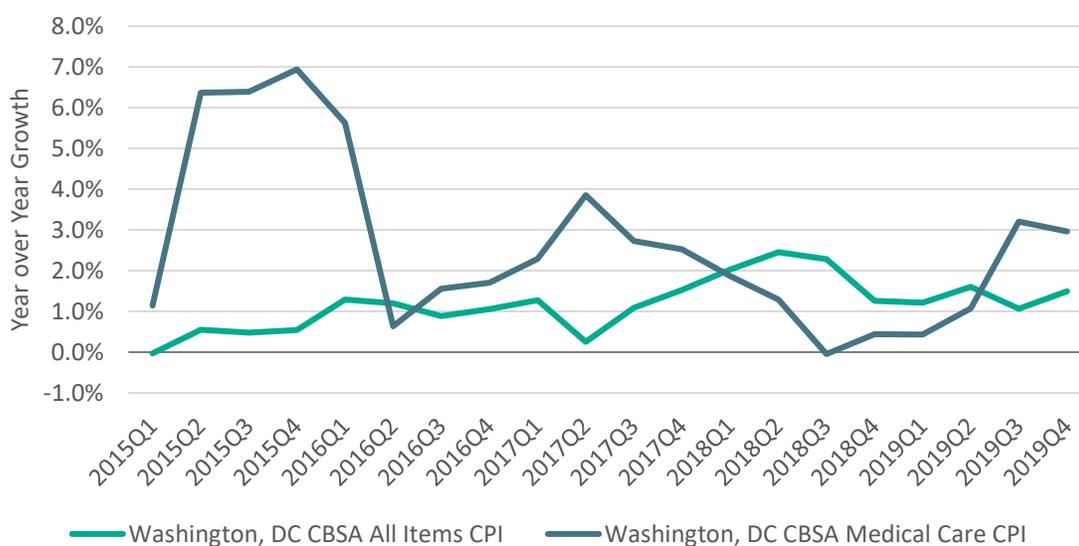
Figure B1: Washington, DC CBSA Boundaries Map





For these subnational regions at the time of analysis, BLS produces data on the overall consumer price index (CPI) for medical care services. While overall health sector price trends contain a more detailed and nuanced mix of products and services and also a mixture of consumer and producer price indices, the Medical Care CPI index provides a high-level overview of medical prices and is directly comparable to national trends. These analyses are imperfect, given that the Washington, DC CBSA does not include the entirety of Virginia's population and also includes prices of medical care provided in neighboring states and nearby cities. For that reason, we include these statistics in this report only as an appendix. It is critical to note that these regional price indexes do not impact and have not been used in other sections of this report on health sector spending, employment, or health insurance data, for which complete Virginia Commonwealth data are available.

Figure B2: Medical Care CPI vs. All Items CPI Year over Year Growth

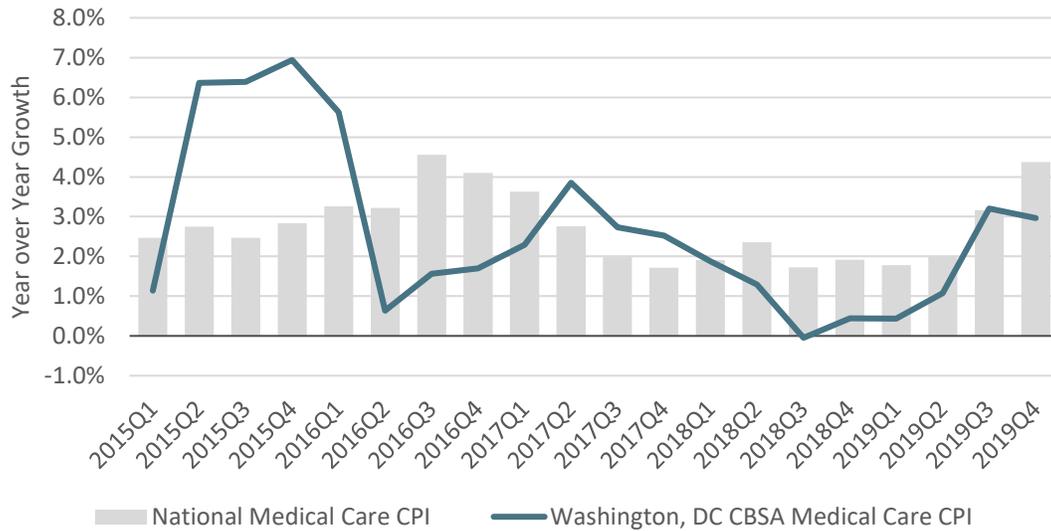


Over the period of 2015 to 2019, medical care prices exceeded overall consumer CPI in Virginia (2.6% vs. 1.2%), particularly for the years 2015 and 2017 (Figure B2). This is broadly consistent with national medical care price index growth over this period, which has grown at an average year over year rate of 2.7% since 2015 (Figure B3). The timing of medical care price index growth has been slightly different in the Virginia region, with 2015 and 2017 exceeding national price growth rates, while 2016 and 2018 were periods where national medical care price index growth exceeded the Virginia rate.

Nationally, over this period private insurance price growth rates have exceeded public payer price index growth and hospital prices have exceeded the broader sector. Unfortunately, these levels of payer and component prices are not available at the regional or local level for BLS. Yet, given the overall price growth similarity between the two, we might expect similar sub-trends as well. While price growth across all sectors and the health sector has been mostly modest since 2015 in BLS price index data, there is some evidence of rising health care prices nationally in 2020, which might also be expected to contribute to regional price growth as well.



Figure B3: Washington, DC CBSA Medical Care CPI Year over Year Growth



Important to note about this analysis, is that these data explore overall price changes and not price levels. While overall medical care price growth has been somewhat modest and just slightly above overall CPI since 2015, this does not describe or explain current price levels, which for some payers, products, and/or services are often quite high.