



ACUMEN

**Maryland Model Analytics Consultant -
Evaluation of Maryland Medicare Spending on
Chronic Conditions**

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EXECUTIVE SUMMARY

Maryland has an arrangement with the Centers of Medicare & Medicaid Services (CMS) that aims among other things to save on the total costs of care for beneficiaries by encouraging care coordination across providers. The Maryland Total Cost of Care (TCOC) Model builds on earlier models that achieved cost savings by focusing on reducing inpatient costs. This report summarizes analyses into the total costs of care for Medicare Fee-for-Service (FFS) beneficiaries with 25 chronic conditions, comparing the costs between Maryland and other states.

Maryland has higher total per beneficiary spending across most chronic conditions than other states; it has lower spending for neurodegenerative diseases. Since the analyses use allowed amounts that do are not standardized to remove geographic or differences in payment policy, Maryland's acute hospitalization costs are higher per beneficiary than other states as a result of the all-payer nature of hospital reimbursement in Maryland. However, the utilization rate is lower for Maryland. Across post-acute care (PAC) settings, Maryland has lower shares of beneficiaries using these services than other states. In addition, the costs for institutional PAC and home health both tend to be lower on average by beneficiary in Maryland, compared to other states.

This report contains two main sets of analyses. The first looks at high-level trends across conditions, such as the mean annual cost per beneficiary and the prevalence of conditions. The second set of analyses looks in detail at the costs per setting by beneficiary, focusing on particular conditions, including those where there are the largest overall differences in mean annual allowed amount between Maryland and other states. By comparing the cost breakdowns for neurodegenerative conditions where Maryland has lower costs, with certain cancers where Maryland has higher costs, we can compare patterns in cost across claim settings.

Future research can build on these findings to identify more specific areas of cost differences and potential cost improvement. Refining the cost metrics used to include only the services related to a given condition and creating clinically actionable categories of services (e.g., direct treatment, imaging, ongoing medication) can provide more granular information to target cost reduction strategies. Other enhancements to the analysis can improve the comparability by using payment standardized data, accounting for differences in patient case-mix, and using a larger data sample for other states.

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1 INTRODUCTION

This report discusses the results of analyses into the spending for patients with chronic conditions in Maryland compared to other states. Section 1.1 provides background to chronic conditions in Maryland, and Section 1.2 outlines the research motivation.

1.1 Background

Chronic diseases have significant health and economic costs in the United States. The CDC estimates that chronic diseases are the leading drivers in the \$4.1 trillion in annual healthcare costs, and that 6 in 10 adults have a chronic disease.¹ In combination with initiatives to prevent chronic disease through reducing key lifestyle risks of tobacco use, poor nutrition, physical inactivity, and excessive alcohol use, the health and economic burdens can be reduced by improving the management of chronic disease symptoms.

Many health agencies and organizations have identified similar chronic conditions as priority areas. The Centers for Disease Control and Prevention (CDC) list heart disease, cancer, chronic lung disease, stroke, Alzheimer's disease, diabetes, and chronic kidney disease (CKD) as priorities.² The Maryland Department of Health's Center for Chronic Disease Prevention and Control identifies heart disease, stroke, and diabetes as leading causes of death and accounting for 75 percent of healthcare costs.³ The Baltimore City Health Department lists asthma, cancer, diabetes prevention, heart disease and stroke as key areas for their chronic disease prevention focus.⁴ Prince George's County runs chronic disease self-management programs for individuals with arthritis, diabetes, heart disease, and hypertension.⁵ The Centers for Medicare & Medicaid Services (CMS) provides prevalence, utilization, and spending for 21 chronic conditions⁶:

- Alcohol abuse
- Alzheimer's disease and related dementia
- Arthritis (osteoarthritis and rheumatoid)
- Asthma
- Atrial fibrillation
- Autism spectrum disorders
- Cancer (breast, colorectal, lung, and prostate)
- Chronic kidney disease (CKD)
- Chronic obstructive pulmonary disease (COPD)
- Depression
- Diabetes
- Drug abuse/substance abuse

¹ <https://www.cdc.gov/chronicdisease/resources/infographic/chronic-diseases.htm>

² <https://www.cdc.gov/chronicdisease/about/costs/index.htm>

³ https://health.maryland.gov/phpa/ccdpc/pages/ccdpc_home.aspx

⁴ <https://health.baltimorecity.gov/programs/chronic-disease-prevention>

⁵ <https://www.princegeorgescountymd.gov/3199/Chronic-Disease-Self-Management-Program>

⁶ https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/CC_Main

- Heart failure
- Hepatitis (chronic viral B and C)
- HIV/AIDS
- Hyperlipidemia (high cholesterol)
- Hypertension (high blood pressure)
- Ischemic heart disease
- Osteoporosis
- Schizophrenia and other psychotic disorders
- Stroke

The Maryland Total Cost of Care (TCOC) Model targets the state to save over \$1 billion in Medicare total cost by the 2023, the fifth performance year of the model.⁷ This model builds on the earlier successes of the Maryland All-Payer Model by shifting from focusing only on the hospital setting and instead creating incentives for care coordination across providers.

1.2 Research Questions

This report examines Maryland’s spending for patients with chronic conditions compared with spending in other states. This can identify potential areas for cost improvement, such as in particular types of care. It also examines particular conditions of interest, as informed by the empirical analyses into the prevalence and spending associated and priority areas identified by health agencies.

Given the widespread impact of the COVID-19 pandemic on healthcare, the report also considers results on available data for 2022 in an appendix. By comparing these results with prior years, we can examine whether the findings continue to hold true, or whether the changes to healthcare appear to have also affected the comparative spending on patients with chronic conditions in Maryland compared with other states.

⁷ <https://innovation.cms.gov/innovation-models/md-tccm>

2 EVALUATION APPROACH

This section describes the evaluation approach. Section 2.1 outlines the data sources, and Section 2.2 defines the study cohort. Sections 2.3 through 2.5 summarize the key metrics examined in the rest of the report: prevalence, spending per beneficiary, and breakdown of costs by setting.

2.1 Data Sources

The study period is calendar year (CY) 2019 to avoid the disruptions to care in 2020 due to the COVID-19 pandemic. To avoid any data censoring issues and allow for claims run-out, a sufficient amount of 2018 and 2020 claims is queried as of April 3rd, 2020. The following data sources are used:

- Chronic Condition Warehouse (CCW) Parts A and B claims
- CCW Beneficiary Cohort Enrollment Data

The analyses use a 100% sample for Maryland beneficiaries and a 5% sample of beneficiaries from all other states.

2.2 Study Cohort

Beneficiaries with chronic conditions are identified using diagnoses and claim restrictions from CCW category definitions.⁸ We examined 2018 data to identify beneficiaries who met the diagnosis and code type definition for any CCW category, and if so, we included them in the patient cohort to study all their claims in 2019. There are enrollment restrictions to ensure comparable data: beneficiaries must be continuously enrolled in Part A and B throughout 2019, or continuously enrolled up to the time of death in 2019. A beneficiary can be included in multiple CCW condition categories.

There are 30 CCW chronic condition categories which are specified using ICD-10 diagnosis codes and qualifying claims. There are some key differences in our implementation, given the scope of the research. Five CCW conditions identified were more acute in nature. Upon clinical review, these five conditions may not represent chronic disease in the way envisaged by the research question. For example, acute myocardial infarction (AMI) itself is not a chronic condition, although is typically caused by chronic heart disease. As such, we omit these five from the results in this report. These are noted in Table 1, below.

⁸ Chronic Conditions Data Warehouse, “Condition Categories”, <https://www2.ccwdata.org/web/guest/condition-categories-chronic>

Table 1. CCW Condition Categories Excluded from Analyses

ISO	Condition	Rationale
1	Acute Myocardial Infarction	AMI is not chronic condition, but is typically caused by heart disease (e.g., coronary artery disease, ischemic heart disease). Defined in the CCW algorithm with a 1-year lookback period.
2	Cataract	Cataracts are not generally considered a chronic disease as treatment is a surgical procedure, rather than ongoing care. Defined in the CCW algorithm with a 1-year lookback period.
3	Hip/Pelvic Fracture	Fractures typically need to be examined over a 3-month episode, but do not typically require ongoing care over years in the way that other chronic disease do. Defined in the CCW algorithm with a 1-year lookback period.
4	Pneumonia	Pneumonias are generally a single episode, rather than recurrent, so are not typically a chronic condition. Defined in the CCW algorithm with a 1-year lookback period.
5	Stroke/Transient Ischemic Attack	Stroke is an acute event that could be evaluated over several months (e.g., 6-12 months). Defined in the CCW algorithm with a 1-year lookback period.

The remaining 25 CCW condition categories are included in this analysis.

2.3 Prevalence of Chronic Conditions and Comorbidities

As a first step, we examined the relative prevalence of these conditions in Maryland compared to other states. Given the differences in sampling, we normalized this to a rate per 100,000 beneficiaries identified in enrollment data. Beneficiaries can be included in multiple chronic condition definitions, so we also analyzed beneficiaries with multiple chronic conditions to see the extent to which Maryland is different from other states.

2.4 Annual All-Cost Spending per Beneficiary

We also examine the total Part A and B spending for each beneficiary identified in the study cohort. These costs are the allowed amounts, meaning that payment differences due to geographic or policy factors are reflected in these costs. It also is important to note that these are the total costs of all care that the beneficiary received in 2019, so does not indicate what share of these costs were for the direct treatment or complications of the condition.

2.5 Source of Spending

The analyses break-down the source of spending by setting to identify whether there are notable differences in Maryland spending compared to other states.

3 RESULTS

This section provides results in three sub-sections: Section 3.1 provides an overall snapshot of cost, while Section 3.2 examines costs by setting across conditions. Section 3.2 explores three conditions in more detail.

3.1 Prevalence, Cost, and Service Utilization Across Conditions

This section provides an overview of metrics related to cost across all 25 chronic conditions. Section 3.1.1 describes the relative prevalence of chronic conditions for Maryland and other states. Section 3.1.2 examines the annual allowed amounts per beneficiary for each condition. Section 3.1.3 discusses the utilization rate for acute inpatient admissions and post-acute care (PAC) as these are both cost drivers. Finally, Section 3.1.4 briefly describes the share of total spending that is for the costliest beneficiaries.

3.1.1 Prevalence of Conditions

A comparison in the prevalence shows that Maryland has a higher number of beneficiaries with most chronic conditions per 100,000 beneficiaries than other states. This is shown in Table 2, below. The condition with the highest differences in prevalence is glaucoma where Maryland has 12,652 per 100,000 beneficiaries with this condition compared to 8,786 for other states. The conditions where Maryland has a lower prevalence than other states are COPD, heart failure and non-ischemic heart disease, and Alzheimer's disease.

Table 2. Number of Beneficiaries per 100,000 Beneficiaries with Chronic Conditions

ISO	Condition	Maryland	Other States	Maryland/ Other States
0	Any of the 25 CCW conditions (1 or more)	67,150	59,701	1.12
1	Hypertension	49,154	41,867	1.17
2	Hyperlipidemia	41,278	34,667	1.19
3	Diabetes	21,069	17,561	1.20
4	Rheumatoid Arthritis/Osteoarthritis	20,539	18,240	1.13
5	Glaucoma	12,652	8,786	1.44
6	Ischemic Heart Disease	12,407	11,807	1.05
7	Anemia	12,186	10,035	1.21
8	Hypothyroidism	11,707	11,663	1.00
9	Depression, Bipolar, or Other Depressive Mood Disorders	11,024	9,952	1.11
10	Chronic Kidney Disease	9,764	9,291	1.05
11	Atrial Fibrillation and Flutter	8,002	7,794	1.03
12	Chronic Obstructive Pulmonary Disease	7,865	8,153	0.96
13	Benign Prostatic Hyperplasia	5,957	5,335	1.12
14	Heart Failure and Non-Ischemic Heart Disease	5,926	6,170	0.96
15	Osteoporosis With or Without Pathological Fracture	5,145	4,855	1.06
16	Asthma	4,401	3,754	1.17

ISO	Condition	Maryland	Other States	Maryland/Other States
17	Non-Alzheimer's Dementia	4,255	3,758	1.13
18	Cancer, Breast	3,041	2,468	1.23
19	Cancer, Prostate	2,793	2,357	1.18
20	Alzheimer's Disease	1,309	1,409	0.93
21	Parkinson's Disease and Secondary Parkinsonism	1,059	981	1.08
22	Cancer, Lung	765	657	1.16
23	Cancer, Colorectal	584	521	1.12
24	Cancer, Urologic	431	416	1.04
25	Cancer, Endometrial	325	266	1.22

Beneficiaries with chronic conditions in Maryland have a similar number of comorbidities as those in other states. Table 3, below, shows the mean number of comorbidities per beneficiary, conditional on having at least one chronic condition.

Table 3. Comorbidities Amongst Beneficiaries with At least One Chronic Condition

State	# Beneficiaries with at Least 1 Chronic Condition	Mean # of Comorbid Chronic Conditions
Maryland	601,696	3.78
Other states	1,203,552	3.73

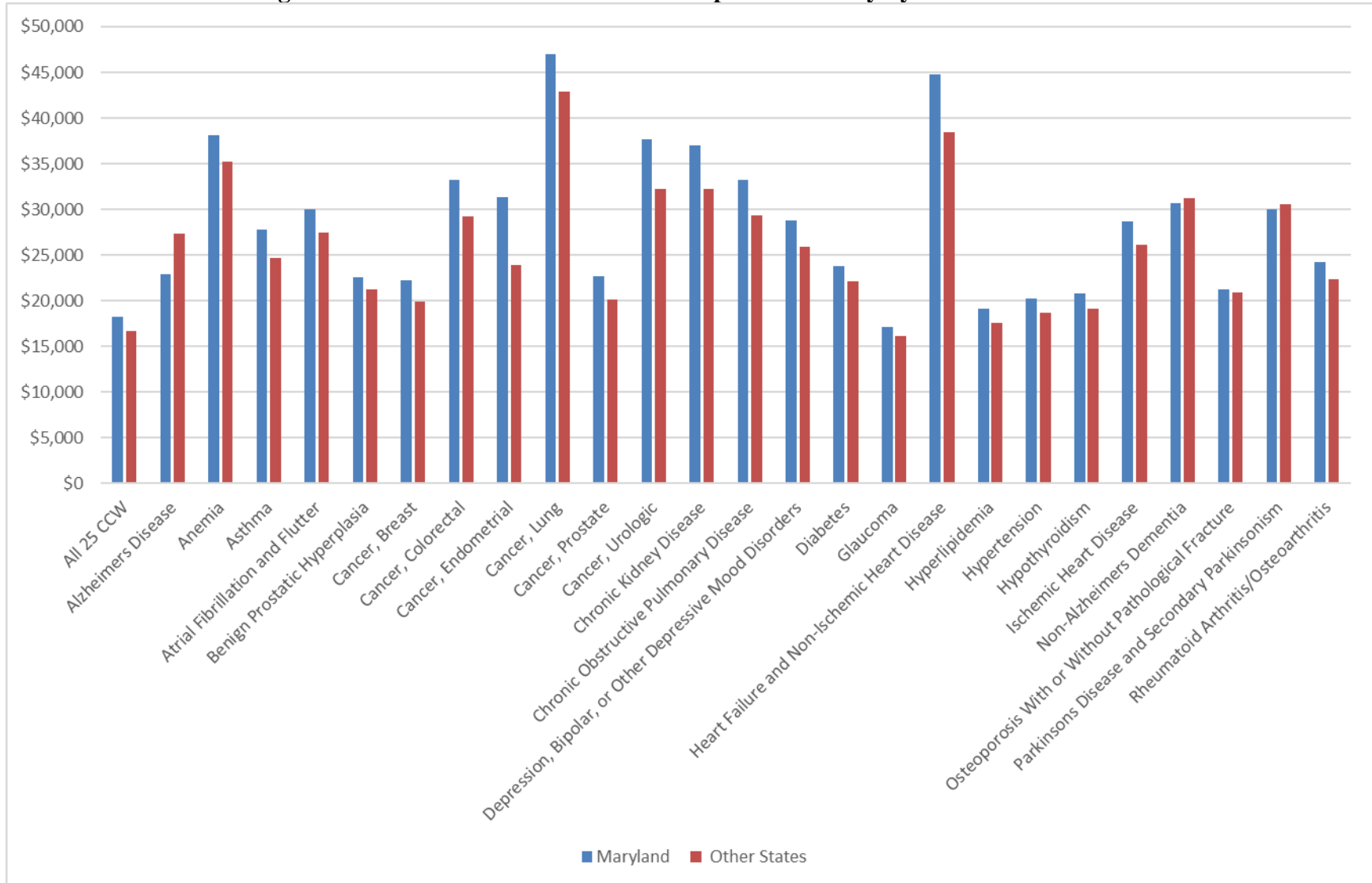
3.1.2 Annual Cost per Beneficiary

In general, Maryland has a higher mean annual cost (allowed amounts) per beneficiary with a given condition than other states. The results are shown in Figure 1, below. Diabetes and rheumatoid arthritis/osteoarthritis are amongst the chronic conditions with the highest prevalence; for both, the mean annual costs are very similar between Maryland and other states. The mean annual allowed amount for beneficiaries with diabetes is \$23,809 compared to \$22,106 for other states. Similarly, the mean cost for beneficiaries with rheumatoid arthritis/osteoarthritis in Maryland compared to other states is \$24,239 and \$22,394, respectively.

We also examined conditions by clinical area and where the magnitude of the difference between Maryland and other states is greatest. Maryland has lower mean annual allowed amounts than other states within the general clinical topic of neurodegenerative conditions. The most pronounced difference is for Alzheimer's disease: beneficiaries with this condition in Maryland have a mean annual total spending of \$22,893 compared to \$27,378 for other states. For conditions where Maryland has substantially higher mean costs than other spending, many are for cancer care. The mean annual spending for beneficiaries with endometrial cancer in Maryland is \$31,394 compared to \$23,866 in other states.

Section 3.2 provides more detail in the cost breakdowns for conditions with high prevalence and where the trends indicate larger differences in mean annual cost between Maryland and other states.

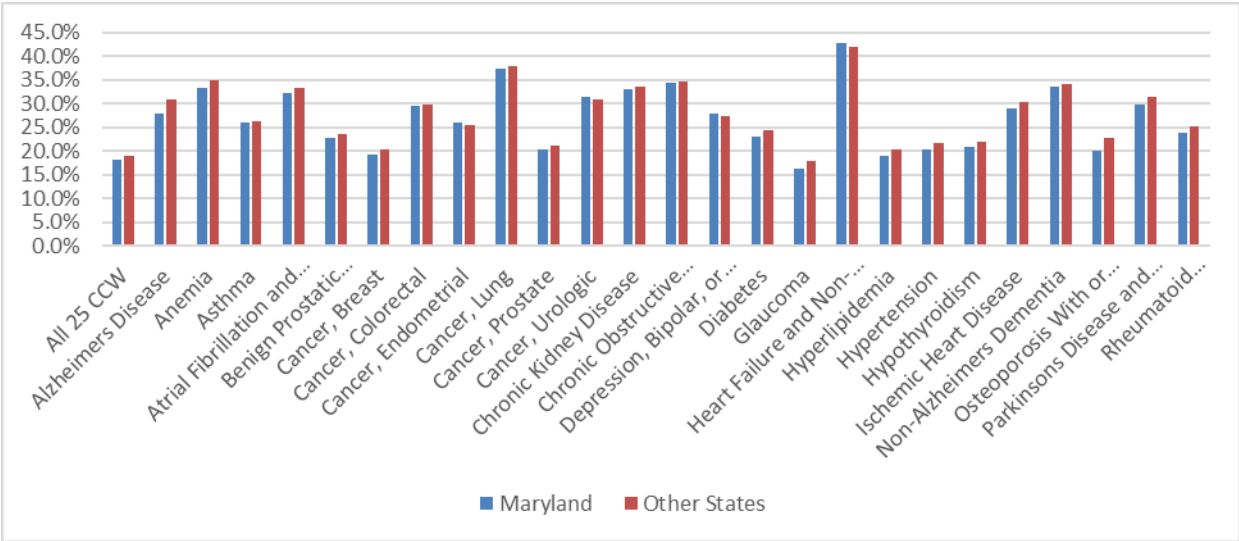
Figure 1. Mean Annual Allowed Amounts per Beneficiary by Chronic Condition



3.1.3 Service Utilization: Inpatient Hospitalizations and PAC

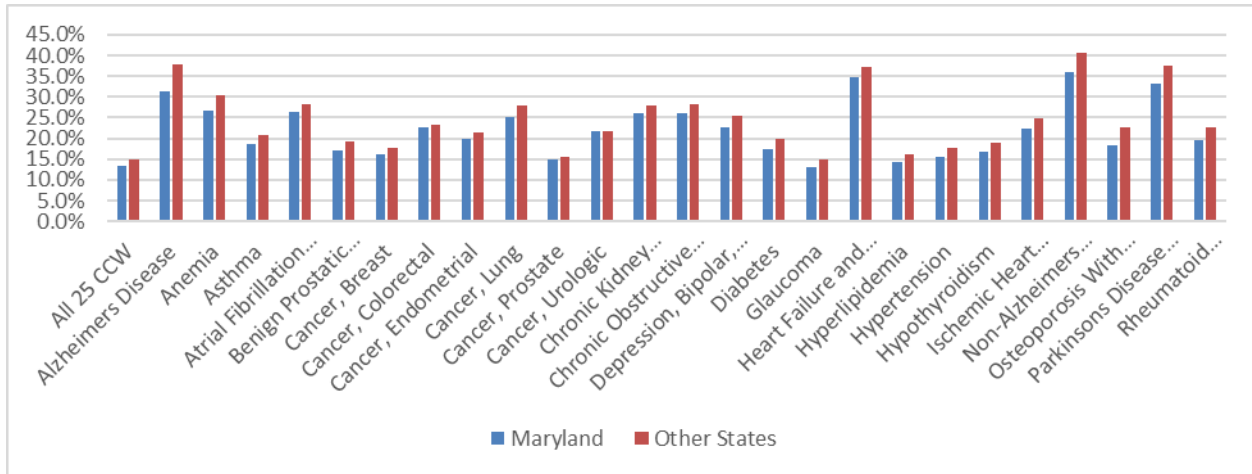
Maryland has a slightly lower rate of chronic beneficiaries receiving one or more acute inpatient hospitalizations than other states across most conditions, as shown in Figure 2, below. Twenty-one of the 25 chronic conditions have a slightly lower hospitalization rate for Maryland beneficiaries compared to other states. However, the magnitude of the difference across conditions is small, with 23 out of the 25 conditions having a less than +/- 2 percentage point difference. Alzheimer’s disease and osteoporosis are the two conditions where the difference is slightly larger: Maryland beneficiaries have a 2.9 and 2.6 percentage point lower rate of acute hospitalization than other states, respectively.

Figure 2. Percentage of Beneficiaries with any Acute Inpatient Hospitalization



Maryland has a lower rate of chronic beneficiaries with one or more PAC service than other states across all 25 chronic conditions, as shown in Figure 3, below. The magnitude of the difference is larger than for acute hospitalizations: Maryland has a lower PAC utilization rate than other states by more than 2 percentage points for 17 conditions. The largest difference is for Alzheimer’s Disease where 31.5% of beneficiaries in Maryland use PAC services compared to 37.8% of beneficiaries in other states. Non-Alzheimer’s Dementia is the condition with the second largest difference: 35.9% of beneficiaries in Maryland with this condition have PAC services, compared to 40.8% of beneficiaries in other states.

Figure 3. Percentage of Beneficiaries with any PAC Services



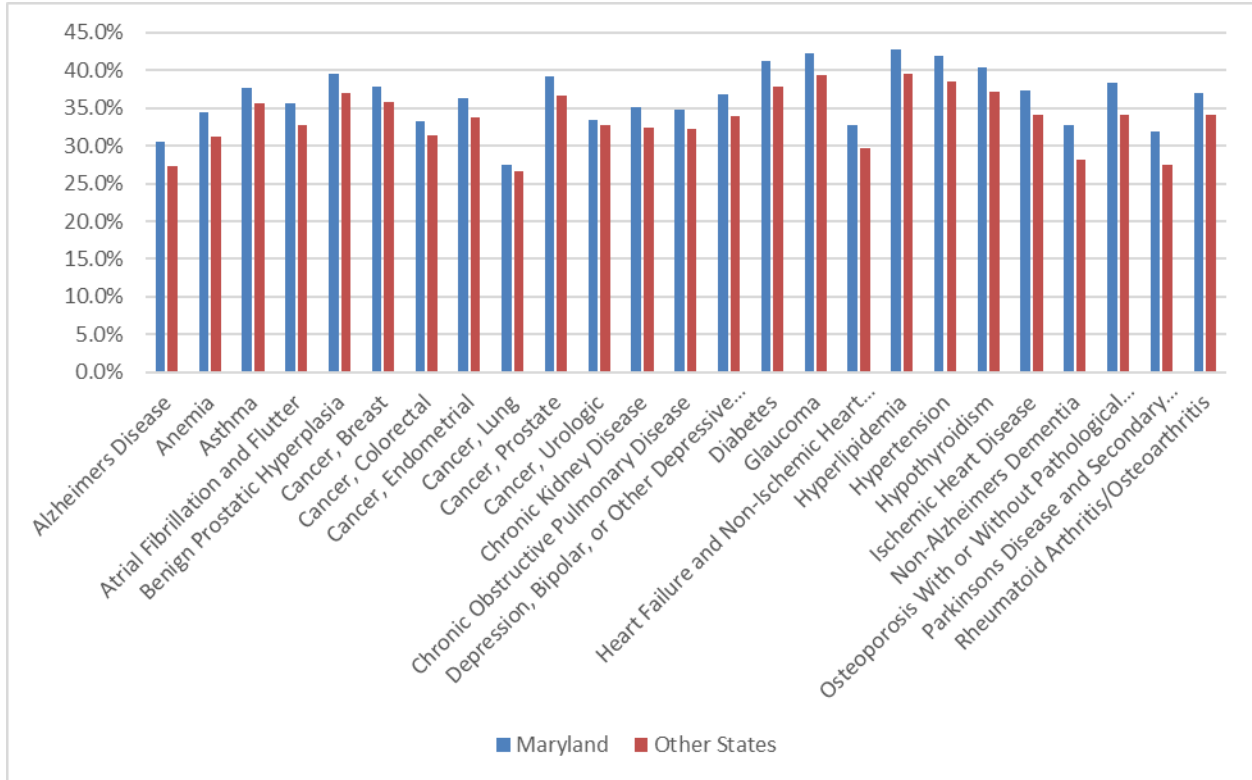
Comparing acute hospitalization and PAC utilization with the annual allowed amounts per beneficiary suggests that costs are driven more by inpatient care rather than PAC. The conditions with the highest rates of hospitalization - heart failure and non-ischemic heart disease, and lung cancer - also have the highest mean annual cost. The rate of PAC utilization for these conditions is similar to other conditions. Non-Alzheimer’s dementia, and heart failure and non-ischemic heart disease have the highest rates of PAC utilization. Heart failure and non-ischemic heart disease is one of the most expensive chronic diseases for Maryland but this is likely caused by its high inpatient utilization. In contrast, non-Alzheimer’s dementia is not amongst the conditions with the highest mean annual allowed amounts per beneficiary and relative to other states, Maryland tends to spend less on average for beneficiary annually while utilizing less inpatient care.

3.1.4 Spending on Costliest Beneficiaries

Maryland spends more on the costliest beneficiaries than other states across all conditions. Maryland spends between 0.6 to 4.6 percentage points more of their total spending for beneficiaries with a given condition on the top 5th percentile of the costliest beneficiaries than other states. The conditions with the largest differences between Maryland and other states are non-Alzheimer’s dementia (4.6 percentage points), Parkinson’s disease (4.3 percentage points), and osteoporosis (4.2 percentage points).

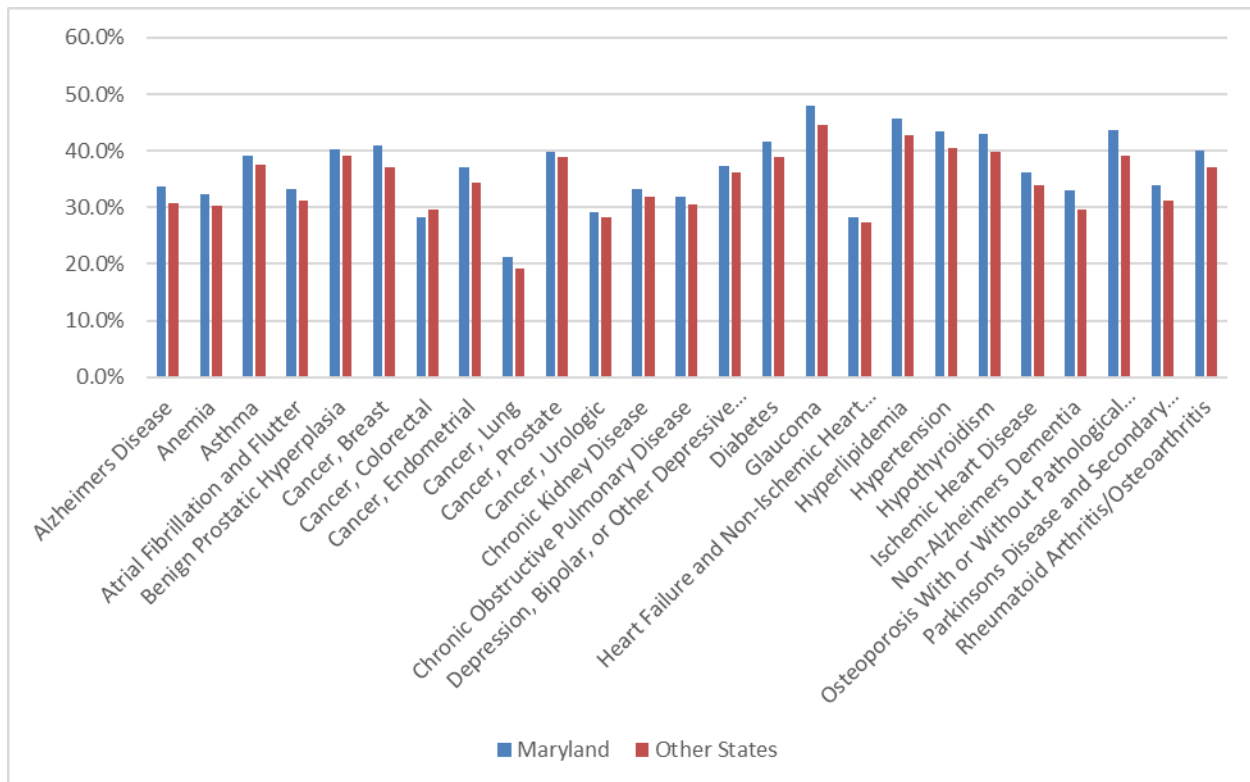
Roughly half of the total spending for beneficiaries with a given condition is expended on the costliest beneficiaries. The 10% of the costliest beneficiaries in Maryland represent 44.3% to 59.8% of the total cost spent on beneficiaries with a given condition. In other states, this figure is slightly lower; 41.8% to 56.7%. For the top 5% of the costliest beneficiaries, the trend persists where Maryland’s spending on these beneficiaries represent 27.5% to 42.7% of the total cost spent within a given condition compared to other states which is 26.7% to 39.5%.

Figure 4. Percentage of Total Condition Spending Spent on Top 5th Percentile of Costliest Beneficiaries



Knowing Maryland’s alternative reimbursement strategy for inpatient hospital services are generally higher, the utilization of acute inpatient services was evaluated to control for the pricing differences. For most conditions, Maryland also has a larger percentage of inpatient admissions occurring within their costliest patients as compared to other states, summarized in Figure 5. The 10% of the costliest beneficiaries in Maryland receive 35.5% to 68.9% of the acute inpatient admissions occurring for beneficiaries with a given condition. In other states, this figure is slightly lower; 33.9% to 65.4%. For the top 5% of the costliest beneficiaries, the trend persists where the share of acute inpatient admissions for chronic patients by the costliest patients in Maryland is 21.2% to 48.0% compared to other states which is 19.3% to 44.5%.

Figure 5. Percentage of Acute Inpatient Visits for the Top 5th Percentile of Costliest Beneficiaries



3.2 Cost from Settings

We also examined trends in cost differences by setting for Maryland and other states. Specifically, utilization rate (i.e., the share of beneficiaries with non-zero cost from that setting) and mean annual total Parts A/B cost from the respective setting.

- Acute inpatient
 - Maryland has a lower percentage of beneficiaries having acute inpatient cost than other states for almost all conditions. The exceptions are depression, heart failure, and two of the cancers, endometrial and lung, discussed in Section 3.3.
 - Maryland has a higher mean acute inpatient spending for all conditions by an average of 35%, ranging from 18% (Alzheimer’s disease) to 69% (endometrial cancer).
- Facility Outpatient (OPPS)
 - Maryland has an average of 11 percentage point lower rates of beneficiaries with outpatient costs across all conditions. The smallest difference is for lung cancer (4.3 percentage points) while the largest is for glaucoma (16.6 percentage points).
 - Maryland has higher mean outpatient cost: across conditions, outpatient costs are an average of 38% more costly for Maryland beneficiaries. The smallest difference is for Alzheimer’s disease (18.9% more) and the largest is colorectal cancer (52.8%).

- Part B physician/supplier
 - Maryland and other states have almost the same rate of beneficiaries with costs from Part B physician/supplier services. The average difference in utilization rate is 0.3 percentage points across conditions.
 - Maryland’s mean costs for this setting are an average of 18.5% more expensive than other states. The smallest difference is for lung cancer (10.4%) and the largest is urologic cancer (30.1%).
- Institutional PAC
 - Maryland’s utilization rate is lower than other states for all conditions except for endometrial and colorectal cancer.
 - Maryland’s mean costs are lower than that of other states across all conditions.
- Home health
 - Maryland’s rate of usage is slightly lower across all conditions: 1.9 percentage points on average.
 - The mean cost from home health is uniformly lower for beneficiaries in Maryland by an average of 18.4% across conditions. Endometrial cancer has the smallest difference with Maryland 3.2% less costly on average.
- Durable medical equipment (DME)
 - Maryland and other states have very similar rates, with an average difference of Maryland having 0.8 percentage points lower than other states.
 - Maryland has lower mean costs from DME than other states for all conditions, except for endometrial cancer. The differences range from Maryland having a mean cost lower than for other states by 26.4% (breast cancer) to 3.4% (prostate cancer).

3.3 Cost by Setting for Particular Conditions

This section discusses particular conditions in more detail and discusses the breakdown of cost by setting. Section 3.3.1 focuses on diabetes as a high-prevalence condition that is also commonly noted as a health priority across agencies. Section 3.3.2 discusses neurodegenerative conditions as Maryland has lower mean per beneficiary spending for beneficiaries with these conditions than other states. Section 3.3.3 discusses various cancers; while some have low prevalence, Maryland had substantially higher mean annual spending than other states.

3.3.1 Diabetes

Table 4, below, shows the rate of utilization and mean annual allowed amounts by claim setting. Hospice is not included as the annual allowed amounts exclude death. As expected, Maryland has higher mean acute inpatient costs per beneficiary than other states. However, Maryland has lower mean costs for institutional PAC settings - inpatient rehabilitation facility

(IRF), long-term care hospital (LTCH,) and skilled nursing facility (SNF). The mean allowed amount from these settings is \$24,959 for Maryland compared to \$29,136 for other states. Outpatient and Part B physician/supplier costs are also higher on average for beneficiaries in Maryland than other states. While utilization is within 1 percentage point for Part B physician/supplier costs (93.4% compared to 92.8%), Maryland has a substantially lower percentage of beneficiaries with outpatient costs (63.7%) than other states (77.3%). Durable medical equipment (DME) has a lower mean annual cost for Maryland than other states: \$1,037 compared to \$1,221.

Table 4. Cost by Claim Settings for Beneficiaries with Diabetes

Claim Setting	Metric	Maryland	Other States
Acute inpatient	% of beneficiaries with non-zero cost	18.9%	20.2%
	Mean annual allowed amount	\$39,890	\$29,890
Outpatient	% of beneficiaries with non-zero cost	63.4%	77.3%
	Mean annual allowed amount	\$7,349	\$5,328
Part B physician/supplier	% of beneficiaries with non-zero cost	93.4%	92.8%
	Mean annual allowed amount	\$6,991	\$5,860
Institutional PAC	% of beneficiaries with non-zero cost	6.6%	7.1%
	Mean annual allowed amount	\$24,959	\$29,136
Home health	% of beneficiaries with non-zero cost	12.2%	14.2%
	Mean annual allowed amount	\$10,981	\$13,620
DME	% of beneficiaries with non-zero cost	49.0%	50.4%
	Mean annual allowed amount	\$1,037	\$1,221

3.3.2 Neurodegenerative Conditions: Alzheimer’s Disease, Non-Alzheimer’s Dementia, Parkinson’s Disease

The cost by claim setting breakdowns are similar across the three neurodegenerative conditions. Tables 5, 6, and 7 provide these for Alzheimer’s disease, non-Alzheimer’s disease, and Parkinson’s disease and secondary Parkinsonism, respectively. Maryland has lower utilization rates and mean allowed amounts from the institutional PAC and home health settings across these conditions, compared to other states. Maryland has similar DME usage rates as other states, but has slightly lower mean allowed amounts. For the other settings, Maryland has higher mean spending.

Table 5. Cost by Claim Settings for Beneficiaries with Alzheimer’s Disease

Claim Setting	Metric	Maryland	Other States
Acute inpatient	% of beneficiaries with non-zero cost	17.7%	20.1%
	Mean annual allowed amount	\$26,190	\$22,252
Outpatient	% of beneficiaries with non-zero cost	56.1%	62.0%
	Mean annual allowed amount	\$4,261	\$3,584

Claim Setting	Metric	Maryland	Other States
Part B physician/ supplier	% of beneficiaries with non-zero cost	77.1%	75.2%
	Mean annual allowed amount	\$5,462	\$4,933
Institutional PAC	% of beneficiaries with non-zero cost	10.0%	12.5%
	Mean annual allowed amount	\$21,179	\$26,920
Home health	% of beneficiaries with non-zero cost	18.8%	22.6%
	Mean annual allowed amount	\$11,395	\$15,262
DME	% of beneficiaries with non-zero cost	23.8%	23.8%
	Mean annual allowed amount	\$1,024	\$1,282

Table 6. Cost by Claim Settings for Beneficiaries with Non-Alzheimer’s Disease

Claim Setting	Metric	Maryland	Other States
Acute inpatient	% of beneficiaries with non-zero cost	22.1%	22.9%
	Mean annual allowed amount	\$34,043	\$24,863
Outpatient	% of beneficiaries with non-zero cost	58.4%	64.0%
	Mean annual allowed amount	\$5,870	\$4,379
Part B physician/ supplier	% of beneficiaries with non-zero cost	76.9%	76.0%
	Mean annual allowed amount	\$6,513	\$5,686
Institutional PAC	% of beneficiaries with non-zero cost	13.0%	14.6%
	Mean annual allowed amount	\$24,315	\$28,312
Home health	% of beneficiaries with non-zero cost	21.4%	24.3%
	Mean annual allowed amount	\$12,508	\$15,934
DME	% of beneficiaries with non-zero cost	27.3%	26.8%
	Mean annual allowed amount	\$1,279	\$1,487

Table 7. Cost by Claim Settings for Beneficiaries with Parkinson’s Disease and Secondary Parkinsonism

Claim Setting	Metric	Maryland	Other States
Acute inpatient	% of beneficiaries with non-zero cost	21.7%	23.7%
	Mean annual allowed amount	\$32,299	\$25,400
Outpatient	% of beneficiaries with non-zero cost	66.6%	73.8%
	Mean annual allowed amount	\$5,948	\$4,640
Part B physician/ supplier	% of beneficiaries with non-zero cost	84.7%	84.6%
	Mean annual allowed amount	\$7,744	\$6,430
Institutional PAC	% of beneficiaries with non-zero cost	12.7%	14.4%
	Mean annual allowed amount	\$26,794	\$29,633
Home health	% of beneficiaries with non-zero cost	22.5%	25.4%
	Mean annual allowed amount	\$13,898	\$17,439
DME	% of beneficiaries with non-zero cost	32.2%	33.9%
	Mean annual allowed amount	\$1,652	\$1,877

3.3.3 Cancer: Endometrial, Lung, and Urologic

The breakdown of cost by setting for certain types of cancer (in Tables 8, 9, and 10, below), compared against the neurodegenerative conditions, shows different trends. Maryland’s acute inpatient utilization rate is very similar to that of other states for endometrial, lung, and urologic cancer. Whereas, for the neurodegenerative conditions, this rate was lower for Maryland than other states which could dampen the effect of the higher mean allowed amounts. The mean annual allowed amount for outpatient and Part B physician/supplier services is higher for Maryland than other states for beneficiaries with neurodegenerative conditions and these cancers, but the magnitude of the difference is greater here. For example, the mean outpatient allowed amount for beneficiaries with endometrial cancer in Maryland is \$9,932 compared to \$6,613 in other states; that is, Maryland’s outpatient spending is around 50% more than other states. The figures for Alzheimer’s disease are \$4,261 and \$3,584, respectively, which shows Maryland’s outpatient spending 19% more than other states. Another difference is that Maryland’s rate of institutional PAC and home health usage is lower than that of other states by around 2 percentage points for the neurodegenerative diseases; for these types of cancer, the rates of utilization are closer between Maryland and other states. It is very slightly higher for Maryland for institutional PAC endometrial cancer, and home health for urologic cancer.

Table 8. Cost by Claim Settings for Beneficiaries with Endometrial Cancer

Claim Setting	Metric	Maryland	Other States
Acute inpatient	% of beneficiaries with non-zero cost	19.9%	19.7%
	Mean annual allowed amount	\$45,223	\$26,724
Outpatient	% of beneficiaries with non-zero cost	73.9%	82.5%
	Mean annual allowed amount	\$9,932	\$6,613
Part B physician/supplier	% of beneficiaries with non-zero cost	91.2%	91.2%
	Mean annual allowed amount	\$8,913	\$6,889
Institutional PAC	% of beneficiaries with non-zero cost	7.0%	6.9%
	Mean annual allowed amount	\$24,292	\$25,442
Home health	% of beneficiaries with non-zero cost	13.9%	15.1%
	Mean annual allowed amount	\$12,765	\$13,183
DME	% of beneficiaries with non-zero cost	32.7%	32.8%
	Mean annual allowed amount	\$1,661	\$1,535

Table 9. Cost by Claim Settings for Beneficiaries with Lung Cancer

Claim Setting	Metric	Maryland	Other States
Acute inpatient	% of beneficiaries with non-zero cost	24.2%	23.7%
	Mean annual allowed amount	\$38,364	\$28,710
Outpatient	% of beneficiaries with non-zero cost	68.1%	72.5%

Claim Setting	Metric	Maryland	Other States
	Mean annual allowed amount	\$16,836	\$13,937
Part B physician/ supplier	% of beneficiaries with non-zero cost	79.6%	77.8%
	Mean annual allowed amount	\$16,160	\$14,639
Institutional PAC	% of beneficiaries with non-zero cost	6.7%	7.2%
	Mean annual allowed amount	\$24,006	\$25,370
Home health	% of beneficiaries with non-zero cost	14.7%	15.7%
	Mean annual allowed amount	\$10,170	\$12,404
DME	% of beneficiaries with non-zero cost	35.0%	36.3%
	Mean annual allowed amount	\$1,607	\$1,888

Table 10. Cost by Claim Settings for Beneficiaries with Urologic Cancer

Claim Setting	Metric	Maryland	Other States
Acute inpatient	% of beneficiaries with non-zero cost	23.9%	24.0%
	Mean annual allowed amount	\$41,786	\$29,535
Outpatient	% of beneficiaries with non-zero cost	71.0%	81.4%
	Mean annual allowed amount	\$12,876	\$10,700
Part B physician/ supplier	% of beneficiaries with non-zero cost	88.9%	89.6%
	Mean annual allowed amount	\$12,471	\$9,586
Institutional PAC	% of beneficiaries with non-zero cost	6.3%	6.8%
	Mean annual allowed amount	\$21,263	\$26,032
Home health	% of beneficiaries with non-zero cost	14.6%	14.4%
	Mean annual allowed amount	\$10,007	\$12,677
DME	% of beneficiaries with non-zero cost	35.8%	36.5%
	Mean annual allowed amount	\$1,220	\$1,451

4 LIMITATIONS

This section discusses the limitations of the current analysis and provides suggestions for future research that would provide more comprehensive information on the costs of chronic conditions in Maryland compared to other states.

Analyses use annual, all-cost metrics and cannot distinguish what costs are related to a particular condition. This means that the extent to which specific actions can be identified for cost improvement is limited. A clinically refined approach could specify what services should be considered treatment costs (e.g., surgical intervention, medication, therapy), monitoring (e.g., imaging, lab tests), exacerbations of the condition, complications, and other categories of clinical services. Applying this approach would provide more specific insights into areas for potential cost improvement. These could even be specified to focus on actions related to preventing progression or achieving remission, as these could have substantial cost saving impacts. Examples could be preventing dialysis crash starts for patients with CKD or achieving remission for patients with diabetes.

Analyses use allowed amounts, rather than payment-standardized allowed amounts. Medicare allowed amounts do not remove variation in payments due to factors such as geographic differences, add-on payments to teaching hospitals, or incentive payments. Thus, these analyses must be interpreted with caution when comparing Maryland allowed amounts to that of other states, given the differences in payment systems, and the high impact that inpatient spending has on annual beneficiary costs. Future research could add comparisons by payment standardized amounts and test the extent to which differences observed using allowed amounts is neutralized once standardization is applied.

Analyses do not account for differences in patient case-mix. The costs of care are expected to differ based on patient complexity. Adjusting for risk factors allows for comparisons between Maryland and other states when underlying differences in patient risk factors are neutralized.

Analyses are conducted on a limited data sample. Using a 100% sample of administrative claims data would address any concerns about biases from using a 5% sample for the national sample outside of Maryland.

5 CONCLUSION

This report explores the total costs of care for beneficiaries with chronic conditions for Maryland, compared to other states. Overall, the mean annual allowed amounts tend to be higher for beneficiaries in Maryland than other states with some notable exceptions for neurodegenerative diseases. Other key differences in cost and service utilization are:

- Maryland has lower rates of acute inpatient hospitalizations for most conditions. This could suggest that Maryland is able to keep beneficiaries with chronic conditions more stable such that they do not need to be hospitalized as often as in other states.
- The mean allowed amounts per beneficiary for acute inpatient hospitalizations are substantially higher in Maryland than other states.
- Maryland has lower rates of PAC utilization, both institutional PAC and home health across conditions. In addition, PAC costs for beneficiaries in Maryland also tend to be lower than in other states.
- Maryland's mean DME costs are lower than in other states across conditions, except for endometrial cancer. While the mean per beneficiary amount is around \$1,000-\$2,000, the magnitude of the difference is notable, with breast cancer DME on average 26.4% lower in Maryland than in other states.

It remains to be seen how these comparisons would look with payment standardized amounts that remove geographic and other sources of variation unrelated to resource use decisions.

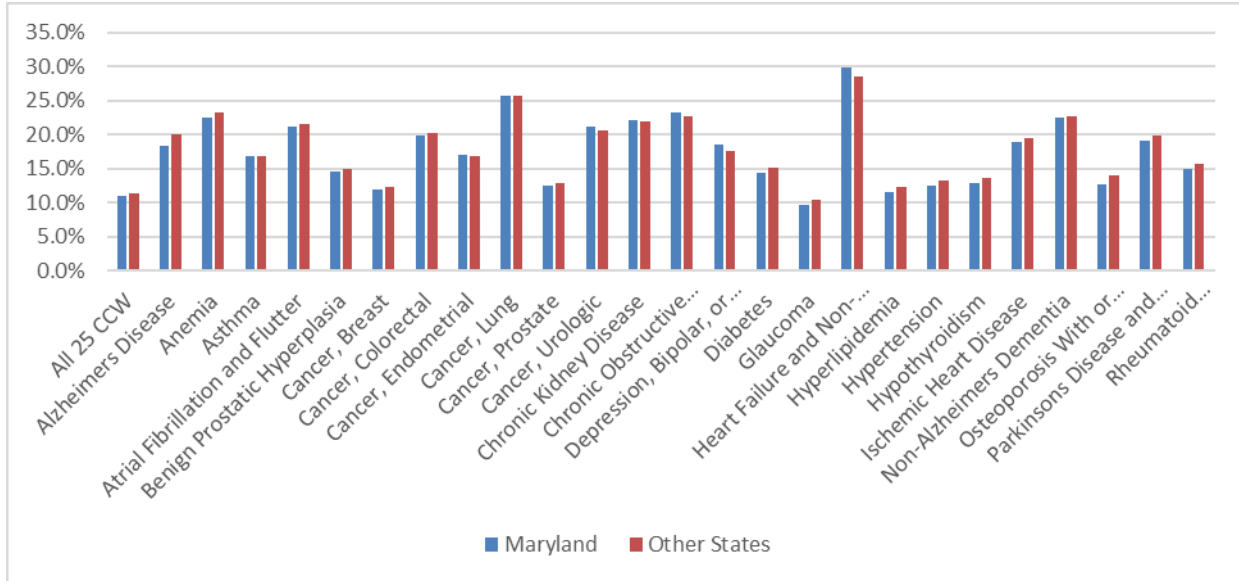
APPENDIX A: 2022 SPENDING AND SERVICE UTILIZATION

This appendix provides updated analyses into cost and service utilization for patients with chronic conditions in 2022. The COVID-19 pandemic has had unprecedented and widespread impacts on healthcare, particularly in 2020 at the start of the public health emergency (PHE). Service utilization across settings dropped dramatically in April 2020 as CMS suspended elective surgeries and stay-at-home orders were enacted around the country. Since then, service utilization has somewhat recovered and stabilized; however, for inpatient hospitalizations, the trend has consistently been lower than 2019.

As the findings described in Section 3 of this report identified that Maryland had lower rates of inpatient hospitalizations for patients with chronic conditions in the CY2019 study period, we have re-run the analyses using an updated study period of January 1 to June 30, 2022. These are benchmarked by comparing them to January 1 to June 30, 2019.

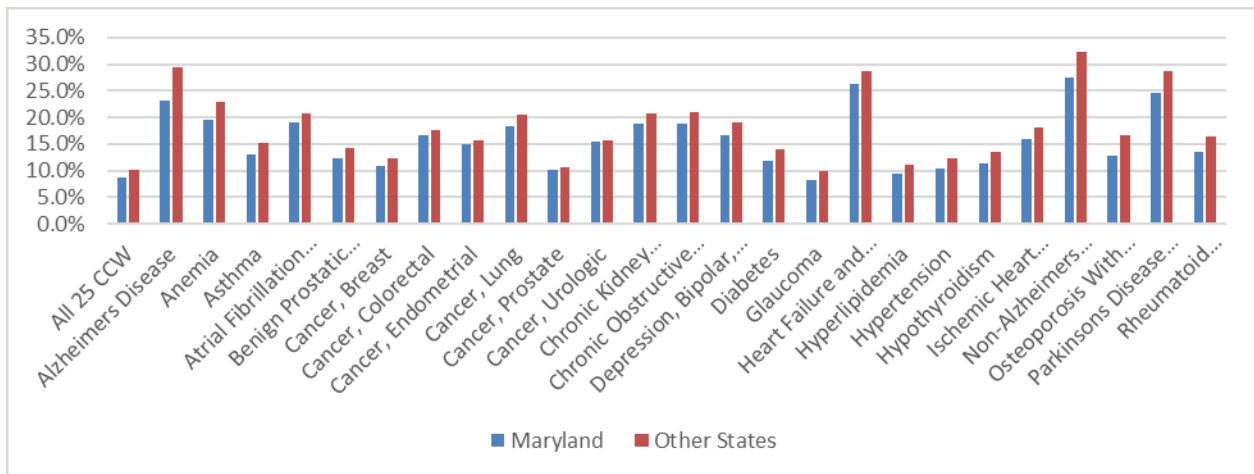
Before evaluating the first two quarters of 2022, the trends for the first two quarters of 2019 must be examined to see if the findings found on CY2019 hold true on a smaller sample of data. The percentage of beneficiaries receiving acute inpatient services in Maryland is still lower than other states for most chronic conditions when evaluating a two-quarter period of 2019, though the magnitude of difference has decreased. On a full year of 2019 data, Maryland has a lower percentage (-0.5 or fewer percentage points difference) of beneficiaries with acute inpatient admissions for 17 of the 25 conditions, little to no difference (between -0.5 and 0.5 percentage point difference) for 5 of the conditions, and a higher percentage (greater than 0.5 percentage point difference) for 3 of the conditions. The greatest difference is for Alzheimer's Disease, where Maryland has a -2.9 percentage point difference than other states. In aggregate across all 25 conditions, Maryland has 18.2% of beneficiaries with acute inpatient admissions while other states have 19.1%. For the first two quarters of 2019, Maryland has a lower percentage beneficiary with acute inpatient admissions for 10 of the 25 conditions, little to no difference for 12 of the conditions, and a higher percentage for 3 of the conditions. The greatest difference continues to be Alzheimer's Disease, where Maryland has a -1.9 percentage point difference than other states. In aggregate across all 25 conditions, Maryland has 11.1% of beneficiaries with acute inpatient admissions while other states have 11.5%.

Figure 6. Percentage of Beneficiaries with any Acute Inpatient Hospitalization (2019Q1-2019Q2)



The percentage of patients receiving any PAC services is generally the same for CY2019 and the first two quarters of 2019. Across all conditions a smaller percentage of beneficiaries in Maryland receive these services compared to other states, though the magnitude of difference has generally decreased by approximately 0.2 percentage points, on average.

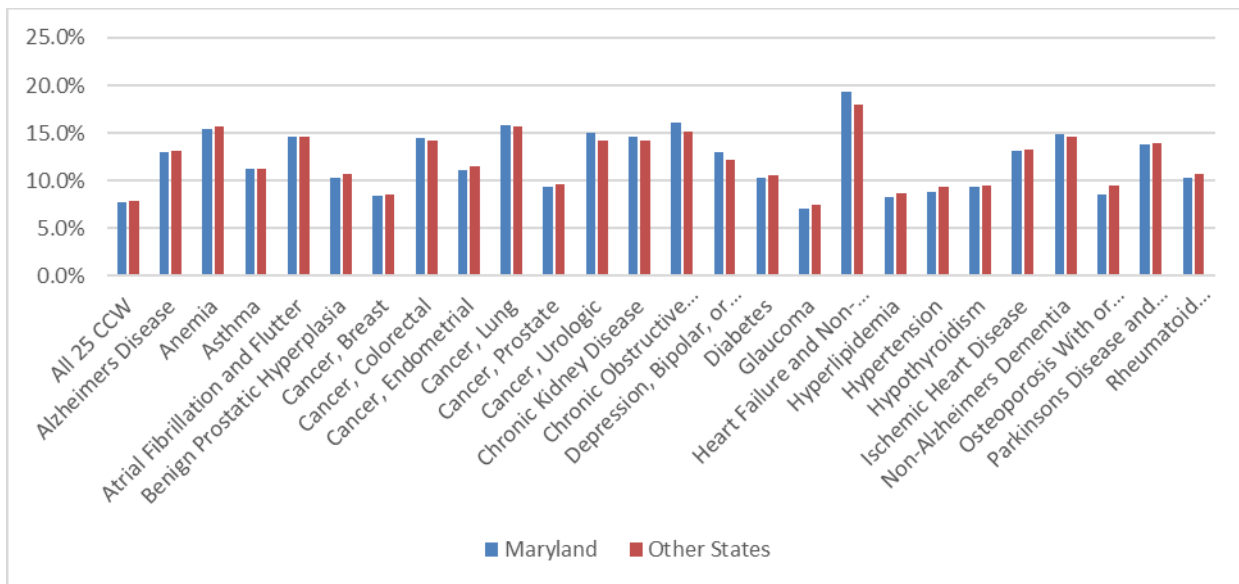
Figure 7. Percentage of Beneficiaries with any Post-Acute Care Services (2019Q1-2019Q2)



After establishing the trends that generally a lower proportion of Maryland patients receive a non-zero amount acute inpatient and PAC services across most conditions for the first two quarters of 2019, comparisons to the first two quarters of 2022 can be evaluated with a pre-pandemic benchmark. In the first two quarters of 2022, Maryland does display lower percentage

of patients with acute inpatient services, though the difference compared to other states is now much smaller. Osteoporosis has the largest differences with 8.5% of beneficiaries in Maryland with at least one acute inpatient stay where as other states show 9.5% of beneficiaries. Maryland has lower rates for 15 other conditions, though the magnitude of difference is within -0.5 and 0.0 percentage points. For an additional 5 conditions, Maryland has higher percentage of beneficiaries with acute inpatient stays than other states, though for a small magnitude difference within 0.0 and 0.5 percentage points. For four conditions Maryland has higher percentage of beneficiaries with acute inpatient stay than others, with a magnitude greater than 0.5 percentage points. In aggregate across all 25 conditions, Maryland has 7.7% of beneficiaries with acute inpatient admissions while other states have 7.9%.

Figure 8. Percentage of Beneficiaries with any Acute Inpatient Hospitalization (2022Q1-2022Q2)



Similar to acute inpatient care, Maryland does display a lower percentage of patients receiving post-acute care services though the difference compared to other states is now much smaller. Across 24 of the 25 conditions a smaller percentage of beneficiaries in Maryland receive PAC services compared to other states, though the magnitude of difference for 10 of these conditions is within 0.5 percentage points, while for 14 of these conditions the difference is larger than 0.5 percentage points. For one condition, prostate cancer, the rates of PAC utilization between Maryland and other states is roughly equal. In aggregate across all 25 conditions, Maryland has 6.7% of beneficiaries receiving some PAC services while other states have 7.1%.

Figure 9. Percentage of Beneficiaries with any Post-Acute Care Services (2022Q1-2022Q2)

