PARTNERSHIP TO FIGHT CHRONIC DISEASE

THE ASSOCIATION OF OBESITY AND CHRONIC CONDITIONS TREATED AS IT RELATES TO THE GROWTH IN HEALTH CARE SPENDING BY SOURCE OF INSURANCE, 2011-2022

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Chronic disease, particularly conditions linked to obesity, has become the dominant driver of U.S. health care spending growth, with the burden concentrated among patients with multiple chronic conditions. This study, drawing on nationally representative expenditure surveys from 1987 through 2022, finds that by 2022, 93% of new Medicare spending and 82% of new Medicaid spending went to treating chronic disease, with most of the growth concentrated among patients with three or more conditions. Obesity is a major contributor, with rates increasing across nearly all chronic disease categories over the past decade.

The analysis shows that spending growth stems not only from more people living with multiple chronic conditions, but also from higher treatment intensity (higher total spending per patient per year) for those patients, up 20% in private insurance and nearly 12% in Medicare between 2011 and 2022. The treatment of chronically ill patients with multiple conditions is inherently complex, often involving several physicians and providers across different disciplines with treatment flowing across multiple settings – inpatient, outpatient, home health, and home care.

Increases in spending among those with multiple chronic conditions underscores that we need a sustained policy initiative to better address both primary and secondary prevention to reduce onset of chronic disease as well as better management of chronic disease among the millions of patients today whose costs of care are increasing at unsustainable levels. Scalable evidence-based interventions—from proven lifestyle programs to promising new therapies and coordinated care models—could not only address high levels of co-morbidity but meaningfully reduce costs and improve outcomes, making chronic disease a central focus in today's health policy debates. These findings suggest that policy solutions aimed at slowing health care cost growth must go beyond price controls and a myopic focus on components of health care spending to instead pursue approaches for reducing the level and growth in overall health care spending per chronically ill patient. Sustained policy shifts to better address the underlying drivers of the high level and growth in spending emphasizing prevention and better care coordination and management of chronic disease are essential.

CHRONIC DISEASE LANDSCAPE

Between 2024 and 2025 health expenditure increased 7% to over $5.6 trillion some 18.5% of the overall economy.[1] Spending is expected to grow at an average annual rate of 5.7% from 2025 through 2030, which the Centers for Medicare and Medicaid Services (CMS) note is over 1 percentage point faster than the expected average annual growth rate for the gross domestic product (GDP). Successful long-term strategies to control costs require a clear understanding of the factors responsible for rising health care spending over time, yet remarkably few recent studies have examined the factors underlying the growth in spending. This research explores how the rising rate of chronic disease is driving that spending growth.

As of 2020, it is estimated that about 60% of all U.S. adults have at least one chronic condition, with 20% of adults having two or more chronic conditions. Given the well-known link between obesity and other chronic conditions such as diabetes and heart disease, it is reasonable to expect that some portion of rising health expenditures may be directly traced back to rising obesity and chronic disease prevalence.

In this research, we first estimate the extent to which health spending growth in recent years is associated with rising chronic disease rates. Our focus is on the association of patients with multiple chronic health care conditions on the level and growth in spending. We estimate this impact separately for Medicare, Medicaid and privately insured adults between 2011 and 2022. If obesity and chronic disease are taken as treatable conditions, these results will help inform the potential impact of policy approaches that target the prevention of and better care coordination of chronic illnesses to reduce health care spending.

STUDY DATA AND METHODS

Data for the analysis come from two nationally representative surveys of the non-institutionalized U.S. population: the 1987 National Medical Expenditure Survey (NMES); and the 2011, 2016, 2022 Medical Expenditure Panel Survey, Household Component (MEPS- HC).[2] The MEPS-HC collects data from a sample of families and individuals in selected communities across the United States, drawn from a nationally representative subsample of non-institutionalized, non-military households that participated in the National Health Interview Survey (conducted by the National Center for Health Statistics). During the interviews, MEPS-HC collects detailed information for each person in the household on the following: demographic characteristics, health conditions, health status, use of medical services, health care charges and source of payments, access to care, satisfaction with care, health insurance coverage, income, and employment. The panel design of the survey, which includes nationally representative estimates were obtained using each survey's respective sampling weights. When necessary, NMES 1987 charges were adjusted to payments according to methods described by Zuvekas et al.[3] All analyses were conducted in STATA version 18.[4] All dollar estimates are displayed in 2022 dollars, adjusted using the gross domestic product (GDP) deflator.[5]

Both the NMES and the MEPS-HC contain detailed information on self-reported medical conditions, health insurance status, patient demographics, non-institutional health care spending, and use of medical care services. Throughout this analysis, we incorporate measures of treated disease prevalence and chronic disease expenditure, which we measure by linking each self-reported medical encounter in the dataset to a maximum of four disease states, using diagnosis codes. For the 2011 data we use the AHRQ Clinical Classifications Software for International Classification of Diseases Ninth Revision (ICD-9) to collapse the ICD-9 codes into broader three-digit codes, then group these into 61 medical conditions.[6] Data from 2016 and on rely on more detailed ICD-10 coding. Spending estimates include all payments for physician interactions, outpatient care, inpatient care, emergency care, home-health services, and prescription medications. For encounters linked to more than one disease state, we distribute total encounter spending equally across all conditions associated with the visit. We aggregate condition-specific spending across all individuals to obtain yearly spending per condition.

Following methods described previously,[7] we use NMES and MEPS-HC data to determine the number of chronic and acute medical conditions self-reported by individual that has incurred a medical expenditure. We first estimate the proportion of total health care expenditures spent on chronic disease, then drill this down further, classifying individuals according to number of chronic conditions (0, 1, 2, 3, 4 or more). For each category, we estimate the proportion of total health care spending attributable to that group for 1987, 2011, 2016 and 2022. We develop two measures of chronic disease spending. The lower one reported in Tables 1, 4 and 5 apportions total health expenditures during the year as total expenditures times the ratio of chronic conditions to total conditions. If the patient has 5 or more chronic conditions all spending is treated as chronic. We also report a higher estimate by reporting total spending by the number of chronic conditions associated with these patients in Tables 2 and 3. These tabulations report total spending (both chronic and acute care) linked to patients by their number of chronic conditions.

Prior to 2016, the MEPS-HC data were coded using ICD-9 codes, and in 2016 the coding transitioned to ICD-10 coding. The ICD-10 provides more detail and includes over 68,000 diagnostic codes compared to over 14,000 in the in the ICD-9. Starting in 2016, the ICD-10 codes are mapped into Clinical Classifications Software Refined (CCSR) categories to classify the codes into conditions which we use in the analysis.

In addition to tracking the level and growth in spending by the number of chronic conditions treated, we developed a regression model to evaluate whether the underlying costs of treating patients, holding measures of health status and demographics constant, have changed over time. Given the skewness of the spending data, we estimated a generalized linear model (GLM) with log link. The models were estimated separately for Medicare, Medicaid, and privately insured with separate models estimated in 2011 and 2022. We control patient age, income as percent of poverty, educational attainment, gender, body mass index categories (underweight, normal, overweight, obese) and the number of chronic conditions treated. To perform this analysis, we develop a counterfactual estimate of what spending would have been, holding patient characteristics constant but treated at the intensity of care in 2011 and then 2022. To see if the intensity (cost) of treating chronically ill patients has changed over time we tabulated predicted spending in 2011 for the patient mix of demographics and conditions from 2011 using the treatment patterns and intensity from the regression results from 2022. We then compared the predicted 2011 spending (based on 2022 treatment patterns) to their actual spending in 2011. Similarly, we predicted what the mix of patients in 2022 would have cost if treated (using the 2011 regression model) at 2011 treatment levels and patterns. We then compared the predicted 2022 spending levels to actual spending. We tabulated these comparisons separately using the 2011 and 2022 regression results for Medicare, Medicaid and privately insured patients.

RESULTS

Table 1 presents the dramatic increase in health care spending associated with the treatment of chronic disease between 1987 and 2022. The share of total spending to treat chronically ill Medicare patients increased by 9 percentage points from 84% in 1987 to 93% by 2022. As of 2022, 93% of each additional dollar spent in the Medicare program is associated with the treatment of people with at least one chronic disease. The largest percentage increase over this period was among those with private health insurance as the share of insurance payments to treat chronically ill patients increased by 17 percentage points, from 57% in 1987 to 74% by 2022. The share of Medicaid spending treating chronically ill patients increased by 12 percentage points, rising from 70% in 1987 to 82% in 2022. As of 2022, chronically ill patients accounted for 82% of each new dollar of Medicaid spending. Across all adults, spending to treat chronically ill patients increased by 14 percentage points, rising from 68% of total health care spending in 1987 to 82% by 2022.

These results understate the impact that chronic disease has on total health care spending since spending for patients with a comorbid chronic condition are higher than those with no chronic disease. For example, COVID-19 patients with one chronic condition were twice as likely to be hospitalized, those with 3 conditions were 4.7 times as likely and those with 5 or more chronic conditions 8.6 times more likely compared to COVID-19 patients with no chronic conditions. The results were similar with respect to the increased likelihood of an ICU admission.[8] In these cases chronic diseases, particularly for patients with weakened immune systems stemming from conditions including diabetes, lupus, cancers and rheumatoid arthritis, increased the costs of treating hospitalized COVID-19 patients.

The results presented in Table 2 show the dramatic increase in real per capita spending as the number of conditions treated rises. Even adjusting for inflation, the costs of treating patients with multiple chronic conditions have risen sharply since 2011. The most significant increase has been among patients with 3 chronic conditions. Per capita spending increased by 31 and 34% respectively for privately insured and Medicare patients between 2011 and 2022. Spending on Medicare patients with 4 or more chronic conditions increased by over 7% during the same period.

The data in Table 2 outlines the substantial growth in the number of patients treated for multiple chronic conditions. The number of Medicare patients treated for 4 or more conditions increased by over 10 million between 2011 and 2022, rising from 29.1 to nearly 39.6 million. Similarly, the number of Medicaid patients treated for 4 or more chronic conditions increased by over 5.2 million, rising from 7.4 million in 2011 to nearly 12.7 million in 2022. Finally, the number of privately insured adults treated for 4 or more conditions increased by 3.6 million rising from 19.1 to 22.7 million by 2022.

Table 2 also highlights the dramatic increase in per capita spending with the number of chronic conditions treated. Among Medicare patients, spending on those with 4 or more chronic conditions was 3 times higher than those treated for a single condition and 2.7 times higher than those with 2 chronic conditions in 2011. These differences increased between 2011 and 2022 as spending to treat Medicare patients with 4 chronic conditions exceeded $20,000 and was nearly 4.5 times higher than those with a single chronic condition ($4,488).

Medicaid experienced the largest growth in per capita spending between 2011 and 2022, increasing 16.4%, compared to 15.3% for privately insured and 9% for Medicare patients. In 2022, Medicaid patients with four chronic conditions were the most expensive patients treated costing Medicaid $21,464 per person compared to Medicare patients ($20,006) and those with private insurance ($18,463).

Table 3 presents the relationship between total spending (chronic and non-chronic) by the number of chronic conditions treated. Since obesity is considered a chronic condition, we report the percent of adults with obesity by the number of chronic conditions reported. Appendix 1 tabulates the mix of conditions treated for adults with four or more chronic conditions. These results make an even stronger case for preventing and more effectively managing chronic disease. Between 2011 and 2022 over 99% of health care spending was associated with patients treated for one or more chronic conditions, most of that spending (93%) was used to treat chronic conditions. The results were similar for privately insured and Medicaid adults as approximately 95% of total spending over time was linked to patients with at least one chronic condition.

Table 3 also reports on the association between adults with obesity and the number of chronic conditions over time. Across all payers, the share of adults living with obesity rises steadily with the number of chronic conditions and has increased over time. These obesity rates would add to the number of chronic conditions we show in our tabulations. Among Medicaid adults, 25% of adults with no other chronic conditions have obesity. In contrast, more than double this rate, over 51% of those with four or more other chronic conditions also have obesity in Medicaid in 2022. The results were similar for privately insured adults as 26% with no other chronic conditions live with obesity compared to 49% for those with four or more other chronic conditions in 2022. Finally, 37% of Medicare adults treated for four or more other chronic conditions were living with obesity compared to 25% for those with no chronic conditions in 2022.

Obesity rates by the number of other chronic conditions treated also increased between 2011 and 2022. Overall, obesity rates increased by 5 percentage points for privately insured patients, 3 percentage points for Medicare, over 1 percentage point for Medicaid and 4.4 percentage points for all adults. For Medicare patients the increases were particularly pronounced among patients treated for two other chronic conditions. In 2011, 19% of these patients were living with obesity compared to 30% by 2022. Moreover, for each category of chronic diseases treated (1 to 4+) the share of Medicare adults also living with obesity increased between 2011 and 2022.

The results presented in Table 4 calculate the percentage of the growth in total spending attributed to chronic disease. We tabulate this by payer and for two time periods, 2011-2016 and 2011-2022. Among privately insured patients spending on chronic disease has assumed a larger role over time. Between 2011 and 2016, nearly half of the growth in chronic disease spending was associated with the rise in total spending to treat chronically ill patients. However, the share of private insurance spending growth attributed to the growth in chronic disease was higher, 62%, over the entire 2011 to 2022 period. The share of spending growth linked to chronic disease was similar for both Medicaid (81%) and Medicare (93-94%) over both periods. However, most of the growth in Medicare spending over these time periods was concentrated among adults treated for three or more chronic conditions. Between 2011 and 2022, 95% of the growth in total Medicare spending as associated with adults treated for three or more chronic conditions (the growth in inflation-adjusted spending for those with two or less chronic conditions decreased slightly between 2011-2022).

Table 5 presents results showing the share of overall spending growth by payer associated with chronic disease spending by the number chronic conditions treated between 2011 and 2022. Among Medicare patients, 84.5% of the growth in total spending was attributed to adults with four or more conditions, and an additional 10% were associated with adults with three chronic conditions. Over three-quarters of the growth in Medicaid spending over this period was associated with adults treated for three or more chronic conditions. Finally, among privately insured patients nearly 70% (68.1) of the increased private insurance spending was linked to people with three or more chronic conditions.

Finally, Table 6 presents the results of our counterfactual estimates from our regression models to estimate whether the treatment costs of chronically ill patients has changed over time. We report the results for two models. First, using the (inflation-adjusted) regression results from the 2011 models we predict Medicare, Medicaid and private insurance spending using the actual 2022 values. This predicts what each group would have spent per adult treated if treated at the 2011 treatment intensity and levels of care. We compare this predicted spending (treated at 2011 treatment patterns to the actual spending in 2022). Our second model uses the regression results from the 2022 model and uses the observations from the 2011 data to predict what they would have spent if treated at 2022 treatment intensity and levels of care. We compare this predicted 2011 data treated at 2022 treatment patterns to actual 2011 spending. The results are presented below.

MODEL 1 RESULTS

The analysis shows that actual 2022 per capita Medicare spending was $945, some 6.6% higher ($15,195 vs. $14,250), compared to what spending would have been if treated at 2011 levels of care (significantly different p<=.05). We did not find statistically significant differences, predicted vs. actual for the Medicaid or private insurance model.

MODEL 2 RESULTS

Using the actual 2011 data, the second model predicts their per capita spending if treated at the 2022 levels of care. We found very large differences between predicted (treated at 2022 levels of care) compared to actual spending for both privately insured and Medicare patients. For privately insured patients, the results show predicted spending in 2011 that were $1,234, some 20.4% higher ($ 7,276 vs. $6,042) than their actual spending in 2011. We found similar results for Medicare patients. Using the actual 2011 data, predicted spending when treated at 2022 levels of care intensity were $1,555, or 11.7% higher ($14,898 vs. $13,343) than their actual 2011 spending. Both sets of results were statistically significant p<=.05. We did not find statistically significant differences in this model predicted spending vs. actual for Medicaid. Both results highlight the growing need for more effective approaches for engaging and managing patients with multiple chronic conditions going forward to reduce the annual costs of treating patients with multiple chronic conditions.

To further understand changes in the underlying total annual per capita costs of treating chronically ill patients, we considered the distribution of health care spending among adults with one or more chronic conditions and observed shifts in the distribution of spending across health care services provided between 2011 and 2022. Though the magnitudes differed slightly, the direction of change was similar between those with private insurance, Medicare and Medicaid. A shift to outpatient office-based care from inpatient hospital care was noted and prescription drug spending was stable across all payers.

CONCLUSIONS

The analysis shows a dramatic increase in the share of spending attributed to people with chronic disease since 1987. This is particularly true for privately insured patients (a 17-percentage point increase) and Medicaid (a 12-percentage point increase) since 1987. The results also highlight the fact that over 83% of Medicare spending and 95% of the growth in spending is associated with adults treated for four or more chronic conditions.

The analysis also illustrates the fact that the underlying inflation-adjusted costs of treating chronically ill patients has increased over time. The treatment costs of the same chronically ill patients with private insurance were 20% higher compared to the treatment intensity and patterns of care in 2011. Similarly, spending on treating Medicare patients was 12% higher at 2022 treatment pattern and intensity compared to the level of care in 2011. Both the growth in patients with multiple chronic conditions and the patterns and intensity of care provided to them are the key factors accounting for the overall growth in health care spending, particularly for Medicare and privately insured adults. The higher costs of treating patients with multiple chronic conditions highlights the need for more innovation in prevention and treatment to provide more effective and more widely used care coordination interventions such as transitional care, effective medication adherence programs that can help patients better manage these conditions and avoid costly downstream complications and policies that continue to reduce what patients pay out-of-pocket for their prescriptions.

The DPP has proven to reduce overall Medicare spending among participants resulting in it being included as a covered benefit in Medicare. In addition, over 30 new CPT-4 codes have been added to provide care coordination services such as comprehensive care coordination (CCM), behavioral health integration (BMI), primary care management and others. These services are being provided to privately insured and Medicare patients, but more extensive use of these activities could produce on going reductions in spending. These changes would also include integrating a broader range of social services such as transportation, nutrition programs, improved access to healthy foods, improved access to exercise and leisure time activities, in-home fall assessments and a focus on health literacy. Broader use of all of these solutions could reduce the level and growth in Medicare spending.

The complexity of treating these patients has attracted sustained interest in more effective models of care coordination and their impact on spending, use and outcomes. Over 30 new CPT-4 codes have been added to provide care coordination services such as comprehensive care coordination (CCM), behavioral health integration (BMI), primary care management and others.

These services are being provided to privately insured and Medicare patients, but more extensive use of these activities could produce ongoing reductions in spending. Broader use of all of these solutions could reduce the level and growth in Medicare spending. Treating patients in a system without widespread effective use of evidence-based interventions generates avoidable costs that fail to improve outcomes. Effective care coordination models, such as the Vermont Blueprint for Health, take a population-based approach (models include models include social services, transportation and housing, multi-disciplined care teams to address behavioral health and other chronic conditions and patient-centered primary care clinics).[10] Medicare should continue looking for new models to provide comprehensive care coordination and these broader approaches are well worth exploring as a means to lower spending while enhancing outcomes for people living with multiple chronic conditions.

The good news is that the key drivers of the level and growth of health spending—chronic disease—have policy solutions that can address and modify the level and progression of disease. On-going policy discussions on how to slow the level and growth in spending need to focus on chronic disease prevention, including management of risk factors, and avoiding complications that arise from poor management rather than a focus on individual care components that are not responsible for the rise in health care spending to reduce the level of spending needed to treat clinically complex patients.

Table 1. Percent of Total Adult Health Care Spending Attributable to Treatment of Chronic Disease by Source of Insurance year 1987-2022

Source of Insurance	1987	2001	2011	2016	2022	% Point Change 1987-2022
Private Insurance	57%	62%	77%	76%	74%	17%
Medicaid	70%	76%	82%	82%	82%	12%
Medicare	84%	88%	93%	93%	93%	9%
All Adults	**68%**	**76%**	**83%**	**84%**	**82%**	**14%**

Table 2. Real Per Capita Spending by the Number of Chronic Conditions 2011 and 2022					
Source of Insurance and Number of Chronic Conditions	**2011**		**2022**		**Percent Increase in Real Per Capita Spending, 2011-2022**
Private Insurance	**N**	**Average Annual Per Capita Spending**	**N**	**Average Annual Per Capita Spending**	
0	44,524,959	1,493	48,492,844	1,520	1.8%
1	31,302,878	4,200	31,378,267	5,176	23.2%
2	19,562,200	6,634	20,747,732	7,349	10.8%
3	13,647,697	7,961	15,130,547	10,427	31.0%
4+	19,109,612	17,718	22,716,185	18,463	4.2%
Total	**128,147,346**	**6,047**	**138,465,575**	**6,975**	**15.3%**
Medicare	**N**	**Average Annual Per Capita Spending**	**N**	**Average Annual Per Capita Spending**	**Percent Increase in Real Per Capita Spending, 2011-2022**
0	2,957,892	767	4,974,965	1,535	100.1%
1	3,736,691	6,075	4,798,846	4,488	-26.1%
2	5,263,526	6,834	6,416,610	7,515	10.0%
3	6,636,000	8,595	7,458,177	11,529	34.1%
4+	29,148,417	18,671	39,556,017	20,006	7.2%
Total	**47,742,527**	**13,870**	**63,204,615**	**15,106**	**8.9%**
Medicaid	**N**	**Average Annual Per Capita Spending**	**N**	**Average Annual Per Capita Spending**	**Percent Increase in Real Per Capita Spending, 2011-2022**
0	22,106,794	722	31,215,758	746	3.3%
1	11,555,242	4,576	14,036,588	5,522	20.7%
2	5,299,441	6,115	7,518,338	6,146	0.5%
3	2,865,102	10,446	4,608,383	10,741	2.8%
4+	7,408,153	20,461	12,656,463	21,464	5%
Total	**49,234,733**	**5,743**	**70,035,530**	**6,685**	**16.4%**

Source: Author's tabulation From Medical Expenditure Panel Survey- Household Component (MEPS-HC) 2011, 2022

Table 3. Real Spending by Number of Chronic Conditions, Percent w/Obesity and Source of Insurance, 2011-2022

Private Insurance

Number of Chronic Cond.	2011				2016				2022			
	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.
0	66.461	8.6%	21.0%	34.7%	67.683	8.6%	24.9%	38.3%	73.693	7.6%	26.3%	35.0%
1	131.469	17.0%	25.0%	24.4%	119.658	15.2%	24.9%	22.2%	162.429	16.8%	30.7%	22.7%
2	129.775	16.7%	29.8%	15.3%	108.826	13.8%	33.2%	14.0%	152.465	15.8%	33.0%	15.0%
3	108.648	14.0%	34.5%	10.7%	110.148	14.0%	37.8%	9.7%	157.762	16.3%	37.3%	10.9%
4+	338.588	43.7%	48.1%	14.9%	380.807	48.4%	47.0%	15.7%	419.402	43.4%	48.5%	16.4%
Total	**774.942**	**100.0%**	**28.8%**	**100.0%**	**787.121**	**100.0%**	**30.8%**	**100.0%**	**965.750**	**100.0%**	**33.7%**	**100.0%**

Medicare

Number of Chronic Cond.	2011				2016				2022			
	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.
0	2.268	0.3%	18.3%	6.2%	7.197	0.8%	29.7%	6.0%	7.636	0.8%	25.2%	7.9%
1	22.702	3.4%	18.4%	7.8%	25.190	2.9%	20.1%	8.5%	21.537	2.3%	20.4%	7.6%
2	35.970	5.4%	18.7%	11.0%	41.156	4.7%	26.5%	10.9%	48.220	5.1%	29.9%	10.2%
3	57.037	8.6%	24.8%	13.9%	57.342	6.6%	28.7%	12.7%	85.985	9.0%	25.0%	11.8%
4+	544.233	82.2%	35.8%	61.1%	740.045	85.0%	36.7%	61.9%	791.370	82.9%	37.2%	62.6%
Total	**662.209**	**100.0%**	**30.1%**	**100.0%**	**870.930**	**100.0%**	**32.8%**	**100.0%**	**954.748**	**100.0%**	**33.2%**	**100.0%**

Medicaid

Number of Chronic Cond.	2011				2016				2022			
	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.	Total Spending (Billions)	% of Total Spending	% w/ Obesity	% of Pop.
0	15.968	5.6%	26.8%	44.9%	25.456	6.2%	23.5%	46.2%	23.282	5.0%	25.1%	44.6%
1	52.876	18.7%	32.6%	23.5%	42.024	10.2%	34.2%	20.2%	77.515	16.6%	33.1%	20.0%
2	32.407	11.5%	34.1%	10.8%	37.287	9.1%	37.9%	10.3%	46.205	9.9%	37.9%	10.7%
3	29.929	10.6%	41.8%	5.8%	35.199	8.5%	41.6%	5.7%	49.501	10.6%	42.3%	6.6%
4+	151.579	53.6%	48.4%	15.0%	271.864	66.0%	47.3%	17.7%	271.664	58.0%	51.1%	18.1%
Total	**282.758**	**100.0%**	**37.0%**	**100.0%**	**411.832**	**100.0%**	**36.1%**	**100.0%**	**468.166**	**100.0%**	**38.2%**	**100.0%**

Table 4. Percent of Overall Total Spending Growth Attributable to Adult Patients with Chronic Health Care Conditions by Source of Insurance 2011-2022

Source of Insurance	2011 -2016	2011- 2022
Private Insurance	48%	62%
Medicare	94%	93%
Medicaid	81%	81%
Medicare 3+ Conditions	94%	95%
All Adults	92%	80%

Source: Author's tabulation From Medical Expenditure Panel Survey- Household Component (MEPS-HC) 2011, 2016, 2022

Table 5. Percent of Total Growth in Spending Among Adults by Number of Chronic Conditions and Source of Insurance, 2011-2022

Number of Conditions	Source of Insurance			
	Private Insurance	Medicare	Medicaid	All Adults
0	3.8%	1.8%	3.9%	3.2%
1	16.2%	-0.4%	13.3%	6.5%
2	11.9%	4.2%	7.4%	7.9%
3	25.7%	9.9%	10.6%	13.9%
4+	42.4%	84.5%	64.8%	68.6%

Source: Author's tabulation From Medical Expenditure Panel Survey- Household Component (MEPS-HC) 2011-2022

Table 6. Counterfactual Predicted Level of Spending vs Actual Spending per Covered Life 2011, 2022

Model 1 Patients Demographics and Chronic Disease Prevalence in 2022 if treated at the 2011 Level		
	Mean	95% Confidence Interval
Private Insurance Predicted 2022 Spending if Treated in 2011	$6,988	($6,761-7,215)
Private Actual 2022 Spending	$7,633	($6,872-8,394)
Medicare Predicted 2022 Spending if treated in 2011	$14,250*	($13,945-14,555)
Medicare Actual 2022 Spending	$15,195	($14,866-15,524)
Medicaid predicted 2022 spending if treated in 2011	$10,931	($10,197-11,674)
Medicaid Actual 2022 Spending	$10,391	($9,096-11,687)
Model 2 Patients Demographic and Chronic disease prevalence in 2011 if treated at the 2022 Level		
	Mean	95% Confidence Interval
Private Insurance Predicted 2011 Spending if Treated in 2022	$7,276*	($7,097-$7,455)
Private Actual 2011 Spending	$6,042	($5,609-$6,475)
Medicare Predicted 2011 Spending if Treated in 2022	$14,898*	($14,640-$15,156)
Medicare Actual 2011 Spending	$13,343	($12,244-$14,442)
Medicaid Predicted 2011 Spending if Treated in 2022	$10,181	($9,655-10,708)
Medicaid Actual 2011 Spending	$10,391	($8,420-12,363)

*Statistically different (p≤.05), predicted vs actual

Appendix 1. Prevalence of chronic conditions for those with 4+ chronic conditions			
Chronic Condition	**2011**	**2016**	**2022**
Hyperlipidemia	49.4%	50.0%	49.9%
Arthritis	49.7%	49.7%	49.2%
Mental Health Disorders	48.2%	48.7%	48.9%
Hypertension	47.2%	48.4%	49.1%
Endocrine Disorders	47.4%	48.1%	48.0%
Other central nervous system	38.5%	47.3%	46.6%
Heart Disease	46.5%	45.3%	44.3%
Upper GI Disorders	45.4%	45.0%	44.7%
Diabetes	45.4%	44.9%	43.7%
Pulmonary Diseases	46.4%	44.9%	45.6%
Skin	38.2%	42.9%	44.2%
Back Problems	39.7%	41.9%	42.9%
Lupus/Autoimmune Disorders	38.8%	41.1%	40.2%
Cancer	39.3%	38.0%	39.8%
Eye	34.2%	37.3%	39.8%
Circulatory Disorders	27.4%	32.6%	34.1%
Asthma	33.9%	32.5%	36.3%
Female Genital	28.0%	28.5%	29.1%
Headaches	26.5%	28.5%	27.8%
Other GI	29.2%	28.3%	26.9%
Urinary Disease	27.5%	26.7%	30.7%
Kidney Disease	23.3%	25.8%	27.3%
Cataract	24.8%	25.5%	28.5%
Bone	28.0%	25.1%	26.4%
Male Genital	23.9%	24.9%	25.2%
Glaucoma	22.2%	22.3%	22.4%
Cerebrovascular Disease	22.6%	21.7%	22.2%
Hereditary Conditions	19.4%	20.5%	19.8%
Liver Disease	17.2%	18.6%	18.4%
Otitis	18.3%	17.4%	18.2%
Epilepsy	13.5%	16.9%	13.9%
Anemia	20.4%	16.8%	17.6%
Stomach	15.1%	15.5%	13.5%
Blood disorders	11.9%	11.2%	13.1%
Congenital	12.5%	8.9%	10.7%
Paralysis	4.9%	5.7%	0.0%
Source: Author's tabulation From Medical Expenditure Panel Survey- Household Component (MEP-HC) 2011, 2016, 2022			

NOTES

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2. Medical Expenditure Panel Survey Household Component Overview
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6. Sixty conditions were used, and include heart disease, cancer, trauma, mental illness, pulmonary disease, asthma, diabetes, hypertension, cerebrovascular conditions, arthritis, pneumonia, kidney disease, endocrine disorders, skin disorder, back pain, infections, neoplasms, dyslipidemia, anemia, blood disorder, central nervous system disorders, hereditary conditions, paralysis, headache, epilepsy, coma, cataracts, glaucoma, other eye disorder, ear infections, circulatory problems, flu, tonsillitis, bronchitis, intestinal conditions, mouth and teeth problems, upper GI disorders, appendicitis, hernia, stomach disorders, other GI problems, liver disease, urinary tract infections, urinary problems, meningitis, breast problems, pregnancy/birth, and several others
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