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It is Not Just the Prices! The Role of Chronic Disease in Accounting for Higher Health Care Spending in the United States

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Abstract

Objective: To determine the impact of chronic disease prevalence on per capita health care spending in the United States and Europe. Prior studies have focused on higher reimbursement rates --the prices-- in the United States compared to other countries. However, other factors also account for the higher per capita health care spending in the United States. This paper examines another source, the substantially higher rates of chronic diseases such as cancer, diabetes, and cardiovascular disease as a factor accounting for the difference.

Methods: We compare the prevalence of the most common and expensive chronic conditions in the United States and nine European countries. A regression model was developed to predict the marginal impact of chronic disease on per capita spending. Using European chronic disease prevalence rates, we estimate a counterfactual per capita level of spending.

Results: The U.S. had significantly higher rates of obesity and chronic conditions than Europe. Obesity was 16.4 percent higher in the U.S. than in Europe, arthritis was 25.5 percent higher, cardiovascular disease was 10.7 percent higher, and cancer was 9.4 percent higher. Applying the lower European rates of chronic diseases, spending would be 17 percent lower in the United States for those 50 and older.

Conclusion: While higher prices contribute to the higher per capita spending in the United States, the higher prevalence of chronic disease is also a significant contributing factor.

ABBREVIATIONS

U.S.: United States; OECD: Organisation for Economic Co-operation and Development; SHARE: Survey of Health, Ageing and Retirement in Europe; HRS: Health and Retirement Study; MEPS: Medical Expenditure Panel Survey; GLM: Generalized Linear Model; CI: Confidence Interval

INTRODUCTION

Adjusting for purchasing power (purchasing power parity), the United States (U.S.) spends twice as much per capita ($10,586) compared to the average of other wealthy developed countries ($5,287) [1]. Several studies have attempted to identify the factors accounting for higher U.S. spending [2]. These studies found that hospital discharges and physician visits were lower in the U.S. compared to other wealthy developed countries [3]. On the other hand, the use of expensive surgical procedures, such as coronary artery bypass graft, total knee replacements, and cesarean sections, were higher in the U.S. Similarly, other studies have found that the health system's capacity (beds, imaging equipment, and the workforce) was similar or lower than in these reference countries [3]. As a result, the general conclusion has been that higher payments to health care providers account for the bulk of the higher U.S. spending [2].

However, compared to Europe, the United States compares unfavorably with respect to several population health measures. These include higher rates of obesity and chronic health care conditions, including heart disease, high blood pressure, high cholesterol, stroke/cerebrovascular disease, diabetes, chronic lung disease, arthritis, and cancer. The higher chronic disease burden in the United States is associated with increased use of health care services and medications.

This paper builds on earlier work and compares the prevalence of chronic disease in the U.S. and Europe [4]. To determine the impact of chronic disease prevalence on per capita health care spending, we develop a counterfactual that estimates per capita spending in the U.S. assuming European prevalence rates of chronic disease. We also estimate per capita spending in

the United States assuming the chronic disease prevalence of the healthiest European country—Switzerland.

MATERIALS AND METHODS

Data on per capita spending (adjusted for purchasing power parity), were obtained from the OECD Health Data [5]. Estimates of disease prevalence and medication use rates were obtained from the 2017 Survey of Health, Ageing, and Retirement in Europe (SHARE), and the U.S.-based 2016 Health and Retirement Survey (HRS). The SHARE survey includes detailed data on nine countries, including Austria, Germany, Sweden, Spain, Italy, France, Denmark, Greece, and Switzerland. In addition, we use the Medical Expenditure Panel Survey (MEPS), from 2015 and 2016 to calculate total health spending per person, chronic disease prevalence, and other patient characteristics.

The SHARE survey was modeled after the HRS survey and is representative of the countries in Europe included in the survey and the United States for the non-institutionalized population aged 50 and above. Since the SHARE survey was modeled after the HRS, it allows for a direct comparison of risk factors such as obesity and smoking as well as chronic disease prevalence for the most expensive and common conditions. Detailed descriptions of the three surveys used in the analysis are provided elsewhere [6-8].

We calculate obesity, smoking prevalence, and the prevalence of 8 chronic diseases reported in Europe and the United States as well as countries within Europe participating in the SHARE survey. The physician-diagnosed conditions include heart disease, high blood pressure, high cholesterol, stroke, diabetes, chronic lung disease, arthritis, and cancer. We also display the percent of these chronically ill patients taking medications if they responded positively to the query: "Do you currently take medication at least once a week for each of the conditions?" Using these results, we compare the prevalence and medication rates for each of the eight chronic conditions that were included in both the United States and European surveys to calculate the percent taking medications. In addition, temporal trends were analyzed by comparing 2015/2016 differences between Europe and the United States with differences in 2004.

Using the MEPS data from 2015, we calculate total health care spending per person for all adults aged 50 and above. Using this as the dependent variable, we then include dummy variables for ten chronic conditions, as well as three age categories (50-64, 65-74, 75 plus), gender, race and ethnicity dummies, family income, educational attainment, employment status and current health insurance coverage (uninsured, Medicare, Medicaid, private health insurance). The ten chronic conditions included the 8 conditions above plus osteoporosis and asthma, which were not available for comparison between the United States and Europe; however, they have significant prevalence in the United States. Obesity is not a MEPS variable and therefore was excluded from the regression. Following previous work, we used a GLM model with log-link to run the regression [9].

Using the regression results, we calculate a counterfactual spending amount in the United States assuming the lower European chronic disease prevalence levels. The GLM model allows us to calculate the marginal impact on spending for each of the chronic health care conditions. We then calculated the marginal effects of each condition at the mean prevalence for each. Using the prevalence data from Europe, we adjusted the U.S. average predicted expenditures based on the change in European prevalence times the marginal effect. All other non-chronic disease covariates remained at the original U.S. levels. In addition to comparing the U.S. to the eight European countries, we also compared a low chronic disease prevalence country, Switzerland, to estimate what U.S. spending might be based upon their chronic disease prevalence.

RESULTS AND DISCUSSION

Comparing Chronic Condition Prevalence

Table 1 compares the prevalence of obesity, smoking, and several chronic conditions in the U.S. and European countries. For each of the eight conditions examined, chronic disease prevalence was higher in the United States. Among those 50 and older, nearly 37 percent were considered obese in the United States compared to 20 percent in Europe. As a result, four conditions strongly associated with obesity: heart disease, hypertension, high cholesterol, and type 2 diabetes were double (or nearly in the case of type 2 diabetes) the prevalence in Europe. The higher rate of diabetes in the United States than Europe is consistent with data from the OECD [10]. Among those 50 and older, over 20 percent had heart disease in the U.S. compared to 10.7 percent in Europe. Similarly, approximately 55 percent of those 50 and above had high blood pressure in the U.S. compared to under 40 percent in Europe.

Even larger U.S.-Europe differences were found for arthritis. Over 52 percent of those 50 and older had arthritis in the U.S. compared to 27 percent in Europe—a full 25 percentage point difference. Smaller differences were found for stroke (2.4 percentage points higher in the U.S.) and chronic lung disease (3.9 percent higher in the U.S.).

One striking result was the significantly higher cancer rates among those 50 and above in the U.S. Cancer prevalence averaged 4.7 percent among the 8 European countries compared to over 14 percent in the United States. Whether this is due to more aggressive cancer screening or representing real differences in prevalence in the United States is unclear.

Not only is the prevalence of chronic disease in the United States higher than the European average, but it also exceeds the average for nearly every European country (Table 2). The prevalence of heart disease in the United States among those 50 and above is 21.4 percent. Heart disease prevalence ranges from 7.5 percent in Switzerland to 11.1 percent in Germany. The prevalence of high cholesterol in Europe ranged from 14.1 percent in Switzerland to 30.3 percent in Spain compared to 35.2 percent in the United States (Tables 1 and 2). Hypertension prevalence ranges from 28.7 percent in Switzerland to 45.5 percent in Germany compared to 54.9 percent in the United States. Finally, diabetes prevalence ranged from 10.8 percent in Sweden to 17.8 percent in Spain compared to 22.5 percent in the United States.

We also compared the most recent differences between the United States and Europe to the differences tabulated using

Table 1: Prevalence and in the United States and Europe.

	MEPS 2015 U.S.			HRS 2016 U.S.			SHARE 2017 EUROPE			
	N=9,221 Prevalence United States Percent	95% CI		N = 19,620 Prevalence United States Percent	95% CI		N = 30,970 Prevalence Europe Percent	95% CI		U.S./Europe Difference
Heart Disease	18.9%	17.8%	20.0%	21.4%	20.7%	22.2%	10.7%	10.2%	11.3%	10.7%
High Blood Pressure	46.5%	44.9%	48.1%	54.9%	54.0%	55.9%	40.1%	39.2%	41.0%	14.9%
High Cholesterol	36.7%	35.2%	38.1%	35.2%	34.2%	36.1%	23.3%	22.5%	24.1%	11.9%
Stroke/cerebrovascular disease	2.7%	2.3%	3.1%	5.9%	5.5%	6.3%	3.5%	3.2%	3.8%	2.4%
Diabetes	18.6%	17.6%	19.5%	22.5%	21.8%	23.3%	12.9%	12.3%	13.5%	9.6%
Chronic lung disease	18.3%	17.1%	19.5%	9.6%	9.1%	10.1%	5.7%	5.3%	6.1%	3.9%
Arthritis	26.4%	25.1%	27.6%	53.3%	52.3%	54.2%	27.8%	26.9%	28.6%	25.5%
Cancer	12.7%	11.8%	13.6%	14.1%	13.5%	14.7%	4.7%	4.3%	5.1%	9.4%
Obese	33.0%	31.7%	34.3%	36.7%	35.4%	37.9%	20.3%	19.5%	21.0%	16.4%
Current smoker	13.4%	12.5%	14.4%	13.8%	13.1%	14.5%	19.7%	18.8%	20.5%	-5.9%
Former smoker				39.9%	39.0%	40.9%	28.2%	27.4%	29.0%	11.7%
Never smoked				46.3%	45.3%	47.2%	52.1%	51.2%	53.1%	-5.8%

Abbreviations: SHARE: Survey of Health, Ageing and Retirement in Europe; HRS: Health and Retirement Study; MEPS: Medical Expenditure Panel Survey; CI: Confidence Interval

Table 2: Chronic Disease Prevalence in Europe 2017.

	Heart Disease	High Blood Pressure	High Cholesterol	Stroke/ Cerebrovascular disease	Diabetes	Chronic lung disease	Arthritis	Cancer	Obese	Current smoker	Former smoker	Never smoked
Prevalence	11.0%	40.4%	21.1%	6.0%	11.5%	6.3%	15.0%	4.0%	20.8%	22.7%	23.2%	54.1%
Austria Percent	9.8%	38.0%	19.3%	5.0%	10.1%	5.3%	13.3%	3.1%	18.9%	20.4%	21.1%	51.7%
95% CI	12.3%	42.7%	22.8%	7.0%	12.8%	7.4%	16.6%	4.8%	22.8%	24.9%	25.3%	56.6%
Prevalence	11.1%	45.5%	20.8%	4.7%	14.2%	8.0%	31.5%	6.8%	23.7%	21.3%	28.2%	50.5%
Germany Percent	10.0%	43.7%	19.3%	3.9%	12.9%	6.9%	29.8%	5.9%	22.0%	19.6%	26.6%	48.6%
95% CI	12.3%	47.4%	22.4%	5.5%	15.5%	9.1%	33.3%	7.8%	25.3%	22.9%	29.9%	52.4%
Prevalence	9.2%	36.5%	14.2%	3.2%	10.8%	4.4%	22.0%	3.8%	17.4%	12.0%	39.2%	48.8%
Sweden Percent	8.0%	34.2%	12.6%	2.3%	9.4%	3.5%	20.1%	3.1%	15.4%	10.2%	36.8%	46.3%
95% CI	10.3%	38.9%	15.7%	4.0%	12.3%	5.2%	23.9%	4.5%	19.3%	13.8%	41.6%	51.3%
Prevalence	11.6%	40.9%	30.3%	2.5%	17.8%	5.1%	25.4%	3.3%	23.5%	18.8%	28.3%	52.9%
Spain Percent	9.9%	38.0%	27.5%	1.8%	15.7%	3.8%	22.9%	2.4%	20.7%	16.0%	25.4%	49.8%
95% CI	13.2%	43.8%	33.0%	3.3%	19.9%	6.3%	27.8%	4.2%	26.3%	21.6%	31.2%	56.0%
Prevalence	8.5%	41.6%	24.3%	2.7%	11.8%	3.9%	18.3%	3.5%	14.3%	18.7%	23.9%	57.4%
Italy Percent	7.6%	39.7%	22.7%	2.2%	10.7%	3.2%	16.9%	2.6%	13.0%	16.9%	22.2%	55.4%
95% CI	9.4%	43.5%	25.9%	3.3%	13.0%	4.6%	19.7%	4.3%	15.7%	20.5%	25.5%	59.5%
Prevalence	12.6%	31.8%	21.9%	3.1%	10.6%	5.2%	38.3%	4.8%	20.7%	18.5%	31.3%	50.1%
France Percent	11.3%	29.9%	20.2%	2.5%	9.5%	4.4%	36.3%	4.1%	19.0%	16.8%	29.4%	48.1%
95% CI	13.8%	33.6%	23.5%	3.8%	11.8%	6.0%	40.2%	5.6%	22.3%	20.3%	33.2%	52.2%
Prevalence	9.4%	34.3%	24.4%	3.4%	8.0%	7.7%	27.7%	4.1%	17.9%	19.7%	38.5%	41.8%
Denmark Percent	8.3%	32.5%	22.8%	2.8%	7.0%	6.7%	26.0%	3.4%	16.5%	18.2%	36.6%	40.0%
95% CI	10.5%	36.0%	25.9%	4.1%	8.9%	8.7%	29.3%	4.8%	19.4%	21.3%	40.3%	43.7%

Prevalence	10.7%	45.2%	32.2%	3.4%	12.3%	4.2%	19.4%	2.7%	20.8%	24.3%	25.3%	50.3%
Greece Percent	9.4%	43.1%	30.3%	2.7%	11.1%	3.5%	17.9%	2.1%	19.0%	22.3%	23.5%	48.1%
95% CI	11.9%	47.3%	34.1%	4.1%	13.6%	5.0%	20.9%	3.4%	22.7%	26.4%	27.2%	52.5%
Prevalence	7.5%	28.7%	14.1%	1.8%	6.7%	4.0%	24.9%	4.2%	13.9%	22.5%	27.2%	50.3%
Switzerland Percent	6.3%	26.6%	12.5%	1.2%	5.6%	3.1%	22.8%	3.3%	12.2%	20.2%	25.0%	47.7%
95% CI	8.8%	30.9%	15.8%	2.3%	7.8%	4.9%	27.0%	5.0%	15.7%	24.8%	29.3%	52.8%

Abbreviations: **CI**: Confidence Interval

the same two surveys using earlier work from 2004 (Table 3). For three of the chronic conditions examined, the difference in disease prevalence has increased over time. These conditions include high cholesterol (the difference is nearly 10 percentage points higher), diabetes (4.1 percentage points higher), and cancer (2.6 percent points higher). The remaining chronic disease differences remain uniformly higher in the U.S. over time though they are similar to those measured in 2004.

The one positive measure for the U.S. is the increased difference in the share of former smokers in the U.S. compared to Europe. Compared to 2004, the difference is now 5.2 percentage points higher in the U.S. compared to Europe.

Medication Usage Among Chronically Ill

The share of adults (chronic disease prevalence times the prevalence of those taking medication) on medications to treat chronic disease was also higher. For instance, medication use for adults with chronic heart disease was 14.1 percent of adults in the U.S. compared to 9.1 percent in Europe (Table 4). Similarly, 47 percent of older adults take medication for high blood pressure in the United States compared to 37 percent in Europe. Over 17 percent of adults are taking medication to treat diabetes in the U.S. compared to 11 percent in Europe. Finally, nearly 6 percent of those with chronic lung disease are taking medication to treat the condition compared to 2 percent in Europe.

One aspect of the higher health care spending in the U.S. is the higher spending on prescription drugs. Per capita pharmaceutical spending in the U.S. is $1,443 compared to $749 for similar high-income European countries, Japan and Canada [3]. One aspect of that difference is the higher share of adults taking medications to treat their condition. Among three of the most common chronic conditions associated with obesity, heart disease, hypertension, and type 2 diabetes, the share of adults over 50 treating their condition is uniformly higher than in Europe (Table 4).

Marginal Impact on Per Capita Spending by Condition

We now examine the change in U.S. health care spending, assuming the prevalence of the eight chronic conditions were at European levels. The regression results estimating the marginal effect of each chronic health care condition is reported in Table 5. The uninsured spend $5,731 less on health care compared to those with insurance. Similarly, workers who are presumably healthier spend $2,740 less on health care compared to the unemployed. Finally, non-Hispanic blacks, and black and Hispanic adults also spend less on health care compared to non-Hispanic whites.

Table 5 also displays the marginal impact on per capita spending for each of the commonly reported chronic health care conditions in the United States and Europe. Adults with heart disease spend $7,358 more per year than those without heart disease. Those with cerebrovascular disease and stroke spend $13,859 more per year than adults that have not had a stroke. Patients with cancer spend over $7,700 more per year compared to those without cancer. The lowest marginal spending effect was among those with elevated cholesterol, spending over $1,280 more compared to those with normal cholesterol levels.

Table 3: Trends in U.S.-European Prevalence Rates, 2015/2016 Compared to 2004.

	U.S.-Europe Prevalence Difference 2015-2016	Prevalence Percentage Point Difference 2004	2015/16 compared to 2004
Heart Disease	10.7%	10.4%	0.3%
High Blood Pressure	14.9%	17.1%	-2.2%
High Cholesterol	11.9%	2.1%	9.8%
Stroke/cerebrovascular disease	2.4%	1.8%	0.6%
Diabetes	9.6%	5.5%	4.1%
Chronic lung disease	3.9%	4.3%	-0.4%
Arthritis	25.5%	32.5%	-7%
Cancer	9.4%	6.8%	2.6%
Obese	16.4%	16%	0.4%
Current smoker	-5.9%	3.1%	-9%
Former smoker	11.7%	6.5%	5.2%
Never smoked	-5.8%	9.7%	-15.5%

SOURCE: SHARE and HRS
Abbreviations: SHARE: Survey of Health, Ageing and Retirement in Europe; HRS: Health and Retirement Study

Table 4: Percent of Chronically Ill Patient Taking Medications.

	MEPS 2015			HRS 2016			SHARE 2017		
	N=9,221 Prevalence United States Percent	95% CI		N = 19,620 Prevalence United States Percent	95% CI		N = 30,970 Prevalence Europe Percent	95% CI	
Heart Disease	14.3%	13.3%	15.4%	14.1%	13.4%	14.7%	9.1%	8.6%	9.6%
High Blood Pressure	44.5%	43.0%	46.1%	46.9%	46.0%	47.9%	37.6%	36.7%	38.4%
High Cholesterol	33.6%	32.2%	34.9%				18.1%	17.4%	18.8%
Stroke/cerebrovascular disease	1.3%	1.1%	1.6%	2.2%	1.9%	2.5%	2.1%	1.9%	2.4%
Diabetes	17.4%	16.5%	18.3%	17.4%	16.7%	18.1%	11.1%	10.6%	11.7%
Chronic lung disease	14.9%	13.8%	15.9%	5.7%	5.3%	6.1%	2.2%	1.9%	2.5%
Asthma	5.2%	4.7%	5.8%						
Arthritis	16.2%	15.1%	17.3%				11.3%	10.8%	11.9%
Osteoporosis	1.5%	1.2%	1.8%						
Cancer									

Abbreviations: **SHARE**: Survey of Health, Ageing and Retirement in Europe; **HRS**: Health and Retirement Study; **MEPS**: Medical Expenditure Panel Survey; **CI**: Confidence Interval

	Linearized				
	dy/dx	Std. Err.	t	P>|t|	[95% Conf. Interval]
agecat					
65-74	-1186.612	792.1962	-1.50	0.136	-2748.555 375.3299
75+	-2194.071	873.7713	-2.51	0.013	-3916.852 -471.2907
1.female	1319.281	672.1218	1.96	0.051	-5.915471 2644.477
race					
NH Black	-2194.974	739.7879	-2.97	0.003	-3653.585 -736.3635
NH Other	-2549.137	738.3431	-3.45	0.001	-4004.899 -1093.374
Hispanic	-2177.818	851.746	-2.56	0.011	-3857.172 -498.4636
faminc	.0051996	.0082923	0.63	0.531	-.01115 .0215493
educcat					
lths	-1208.569	1040.678	-1.16	0.247	-3260.433 843.294
somecoll	2055.852	1246.567	1.65	0.101	-401.9557 4513.659
collgrad	1407.848	716.213	1.97	0.051	-4.281575 2819.977
1.employed	-2740.323	664.0833	-4.13	0.000	-4049.67 -1430.976
inscat					
uninsured	-5731.042	697.1805	-8.22	0.000	-7105.646 -4356.439
public	1014.685	1000.428	1.01	0.312	-957.8196 2987.19
1.smkcurrent	279.3236	2081.304	0.13	0.893	-3824.303 4382.95
1.heartdis	7357.884	989.3351	7.44	0.000	5407.251 9308.517
1.highbp	2697.977	572.6937	4.71	0.000	1568.82 3827.135
1.lipid	1282.901	663.7914	1.93	0.055	-25.87012 2591.673
1.cerebro	13859.88	3292.663	4.21	0.000	7367.867 20351.9
1.diabetes	5247.603	781.5457	6.71	0.000	3706.66 6788.546
1.pulmnry	4864.107	957.5846	5.08	0.000	2976.075 6752.139
1.asthma	2855.841	1000.179	2.86	0.005	883.8267 4827.856
1.arthritis	6607.502	852.6579	7.75	0.000	4926.35 8288.654
1.osteo	4433.95	3669.772	1.21	0.228	-2801.596 11669.5
1.cancer	7718.64	1394.984	5.53	0.000	4968.204 10469.08

Note: dy/dx for factor levels is the discrete change from the base level.

MEANS

	Linearized		
	Mean	Std. Err.	[95% Conf. Interval]
Total Exp	9609.575	296.7321	9024.519 10194.63
Predicted Exp	10698.64	212.2321	10280.19 11117.09
Any Exp (%)	.9418084	.0031501	.9355974 .9480194

Table 5: Average Marginal Effects of Per Capita Health Care Spending By Chronic Condition Among U.S. Adults Aged 50 and Above.

Predicted U.S. Spending at European Chronic Condition Rates

Next, we used the regression results to calculate average predicted spending per capita. As outlined above, we then computed average per capita spending for each of the eight chronic conditions available in both the U.S. and European data. Per capita spending for those 50 and older at U.S. prevalence levels was $10,698 per year (Table 6). In contrast, U.S. spending would have been $8,841 per year, over 17 percent lower than current health care spending at European prevalence levels.

Finally, we estimated a second counterfactual per capita U.S. spending estimate assuming the lowest prevalence of chronic disease measured in Switzerland (Table 6). The predicted U.S. spending levels as above were $10,698 per capita at the current rates of chronic disease prevalence. Chronic disease prevalence is substantially lower in Switzerland than found in the U.S. One condition associated with obesity is diabetes. In Switzerland, the reported rate was 6.7 percent compared to 22.5 percent among those 50 and older in the U.S. Assuming the U.S. had the same rates of chronic disease as Switzerland, per capita spending would be $7,705, some 28 percent lower than current spending.

Impact on U.S. Health Care Spending

Our analysis shows that for 8 highly prevalent and expensive chronic conditions, the prevalence of disease was significantly higher in the United States compared to Europe. If the prevalence of these chronic conditions in the United States were at European levels, health care spending would be 17 percent lower for patients 50 and older-approximately $220 billion per year. Moreover, if the prevalence were at the country with the lowest rates of disease-Switzerland, spending for those 50 and older would be 28 percent lower than our current levels.

Underlying the higher rate of chronic disease in the United States are the significant differences in the share of adults considered obese. Nearly 37 percent of adults aged 50 and older were considered obese in the United States compared to 20 percent in Europe. Indeed, the obesity rate in the United States was higher than any individual country participating in the SHARE survey. Obesity rates ranged from 13.9 percent in Sweden to a high of 27.7 percent in Germany, considerably lower than found in the United States.

The chronic health care conditions we examined are all associated with obesity and lifestyle-related issues. The significantly higher prevalence rates in the United States than Europe are an important factor in why health care spending in the United States is higher than it otherwise could be.

Addressing the high and rising rates of chronic disease in the United States will require effective prevention tools and more effective treatment models. This will require additional investment to prevent the growth in chronic disease through lifestyle behavior interventions. Moreover, the COVID-19 experience also highlights many of our public health infrastructure and primary care shortcomings, both essential tools in preventing and managing chronic disease. We will have to make investments in both as well as evidence-based care coordination to keep adults healthy and reduce health care spending.

Older studies and recent updates examining the sources of the higher spending in the United States compared to Europe have identified higher reimbursement rates as the key factor. In addition, however, to the higher prices in the U.S. the substantial differences in chronic disease prevalence also contribute to the difference. These higher rates in the U.S. increase spending, and in the analysis presented above is reflected in higher use of medications and per capita spending. Per capita spending in the United States would be meaningfully lower if chronic disease prevalence were at European levels. The results point to the need in future research to track both health care prices and differences in chronic disease prevalence between the U.S. and Europe.

Limitations and Generalizability

One limitation of our results is whether the differences in chronic disease prevalence reflect higher prevalence or are an artifact of more intense screening and treatment in the U.S. Moreover, variations between the U.S. and Europe could also reflect differences in the intensity of care provided. Though these are caveats, the substantially higher rates of obesity found in the U.S. compared to Europe would point to a real difference in chronic disease prevalence. Data collected over time by the Centers for Disease Control and Prevention show the close tracking of obesity prevalence trends and trends in type 2 diabetes and other chronic conditions [11].

A second limitation is that we do not directly measure the source of the lower European spending since the SHARE data do not include spending measures. However, the focus of this study is not a direct comparison of health spending in the United States and Europe; instead, we answer the question of how spending in the U.S. would change if it had lower chronic disease prevalence rates.

CONCLUSIONS

Previous research examining higher per capita health care spending in the United States compared to European and other high-income countries have focused on the higher rates of reimbursement --the prices-- in the United States compared to other countries. Our study examines another source of higher per capita spending, the substantially higher rates of chronic diseases such as cancer, diabetes, and cardiovascular disease as a factor accounting for the difference.

Table 6: Predicted U.S. Spending Per Capita Assuming European and Switzerland Chronic Disease Prevalence Adults aged 50 and Older, 2015/2016.

	Per Capita Spending	
	Europe	Switzerland
Predicted U.S. Spending at current chronic disease prevalence	$10,698	$10,698
Predicted U.S. Spending at European chronic disease prevalence	$ 8,841	$ 7,705
Percent Difference with European Prevalence	-17.4%	-28.0%

Comparing the prevalence of obesity and chronic conditions found significantly higher rates in United States than Europe. Obesity was 16.4% higher in the U.S. than Europe, arthritis was 25.5% higher, cardiovascular disease was 10.7% higher, and cancer was 9.4% higher. Building a counterfactual model using the lower European prevalence rates with U.S. per capita spending, we find that U.S. health care spending for those 50 and older would be 17 percent lower if it had Europe's levels of chronic conditions. Our findings point to the need to more fully understand the drivers of health care spending beyond prices to adequately address the growth of health care spending in the U.S.

If the United States had chronic disease prevalence rates in line with Europe, health care spending would be approximately $220 billion lower. Efforts to initiate effective prevention, earlier detection, and care coordination initiatives would potentially yield significant financial savings to our health care system.

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CONFLICTS OF INTEREST

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