

What are the Health Care Costs of COVID-19 in California?: State and County Estimates

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Abstract

Based on recent antibody studies that report about a 5% prevalence in California, we estimate the health care costs of treating coronavirus disease 2019 (COVID-19) to be \$2.4 billion in California -- six times the annual cost of influenza in the state. Costs vary dramatically across counties due to significant differences in population size, health care prices, and payer mix. Estimated costs are \$617 million in Los Angeles, \$64 million in San Francisco, and \$204 million in San Diego. The cost per infected person is \$1,326, \$1,774, \$289, and \$629 for commercial, Medicare, Medi-Cal/CHIP, and uninsured enrollees, respectively. We also calculate the costs under scenarios of 15%, 30% and 60% prevalence -- the latter being a lower threshold of the prevalence generally assumed to be needed before herd immunity is achieved. Our costing model will be updated as new information about the prevalence and health care utilization and costs are reported for California.

Executive Summary

SARS-CoV-2 and the disease it causes, COVID-19, has put tremendous pressure on California's health care system. While hospital bed capacity has not been exceeded, as early estimates suggested, California hospitals are still experiencing significant costs due to COVID-19. This analysis estimates COVID-19 California health care costs at the state- and county-level now -- with a 5% prevalence -- and if the prevalence were to reach 60%, a lower threshold of the level generally considered to be needed for herd immunity to be achieved.

Based on recent work that suggests about a 5% prevalence in California (Bendavid et al., 2020; Sood et al. 2020), we estimate current California health care costs due to COVID-19 to be \$2.4 billion -- six times the annual cost of influenza in the state.⁷ Should 60% of the population of California eventually become infected, roughly the level needed for herd immunity to be achieved, we estimate COVID-19 health care costs would be \$25.1 billion.

Table E1 presents estimates of current and potential costs by payer and service. Currently, the majority of costs (59%) are hospitalization costs. The remaining 41% are divided fairly evenly between COVID-19 test costs and the outpatient visits. The percentage of costs that are hospital costs increases to 69% in the potential cost scenario of a 60% prevalence.

By payer, the breakdown in costs is currently 59% commercial, 26% Medicare, 10% Medi-Cal, and 5% uninsured. High prices and large enrollment contribute to commercial being a large share of the total costs. The cost per infected person is \$1,326 for commercial, \$1,774 for Medicare, \$289 for Medi-Cal/CHIP, and \$629 for uninsured.

⁷ In this report, estimated costs are defined as the estimated amount paid (also called expenditures).

Table E1: California COVID-19 Health Care Cost Estimates by Payer and Service, 2020

Estimates of current costs (\$ Millions) - 5% prevalence

	Commercial	Medicare	Medi-Cal / CHIP	Uninsured	Total
5% prevalence (\$ Millions)					
COVID-19 Tests	\$294.87	\$101.96	\$128.02	\$45.02	\$569.87
Outpatient Visits					
Office Visits	\$309.75	\$39.38	\$28.15	\$17.39	\$394.67
ED Visits	\$23.29	\$10.59	\$0.88	\$1.21	\$35.98
Hospitalizations					
w/o ventilator	\$326.10	\$199.26	\$37.20	\$22.86	\$585.42
w/ ventilator	\$480.67	\$293.71	\$54.83	\$33.70	\$862.91
TOTAL	\$1,434.68	\$644.90	\$249.09	\$120.19	\$2,448.85
% of baseline spending*	0.9%	0.6%	0.4%	N/A	0.6%

Estimates of potential costs (\$ Millions) - 60% prevalence

	Commercial	Medicare	Medi-Cal / CHIP	Uninsured	Total
60% prevalence (\$ Millions)					
COVID-19 Tests	\$1,301.48	\$450.05	\$565.06	\$198.71	\$2,515.29
Outpatient Visits					
Office Visits	\$3,717.02	\$472.55	\$337.86	\$208.65	\$4,736.07
ED Visits	\$279.67	\$118.23	\$9.88	\$13.65	\$421.43
Hospitalizations					
w/o ventilator	\$3,915.54	\$2,390.62	\$446.67	\$276.09	\$7,028.91
w/ ventilator	\$5,771.49	\$3,523.77	\$658.38	\$406.96	\$10,360.60
TOTAL	\$14,985.19	\$6,955.20	\$2,017.85	\$1,104.07	\$25,062.31
% of baseline spending*	9.7%	6.0%	3.0%	N/A	6.5%

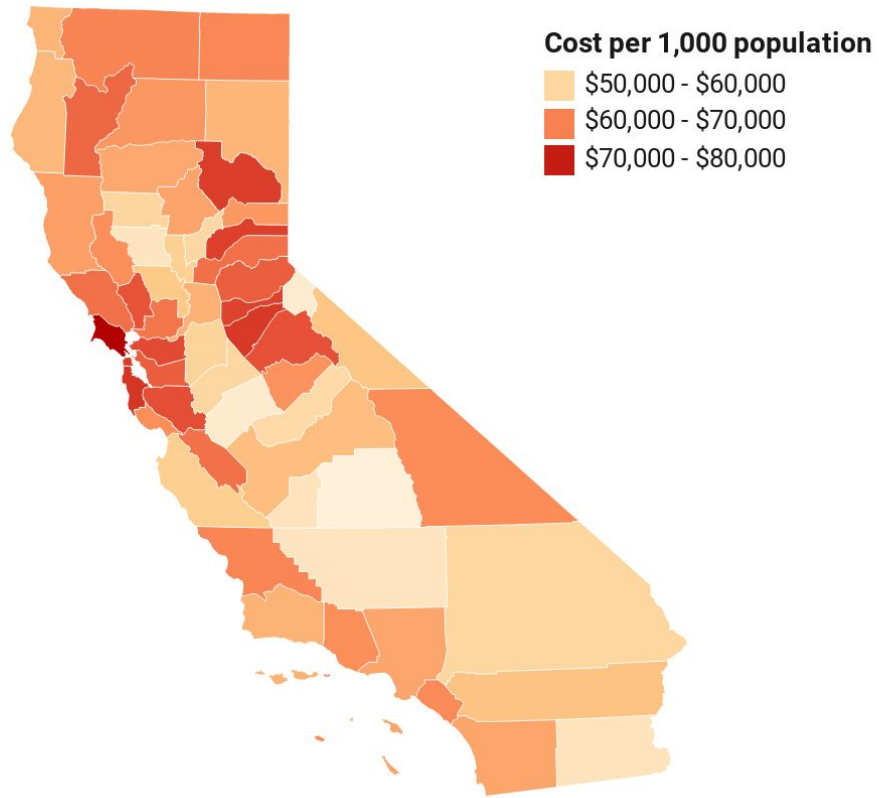
Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HealthLeaders-Interstudy).

Notes: *baseline spending = California health care spending projected for 2020 prior to the emergence of COVID-19. The model assumes all infected individuals plus an additional 10% of the population receive a COVID-19 test. This assumption leads to a less than perfect linear scaling of estimated costs across prevalence. See the appendix for details how we estimated California health care spending in 2020.

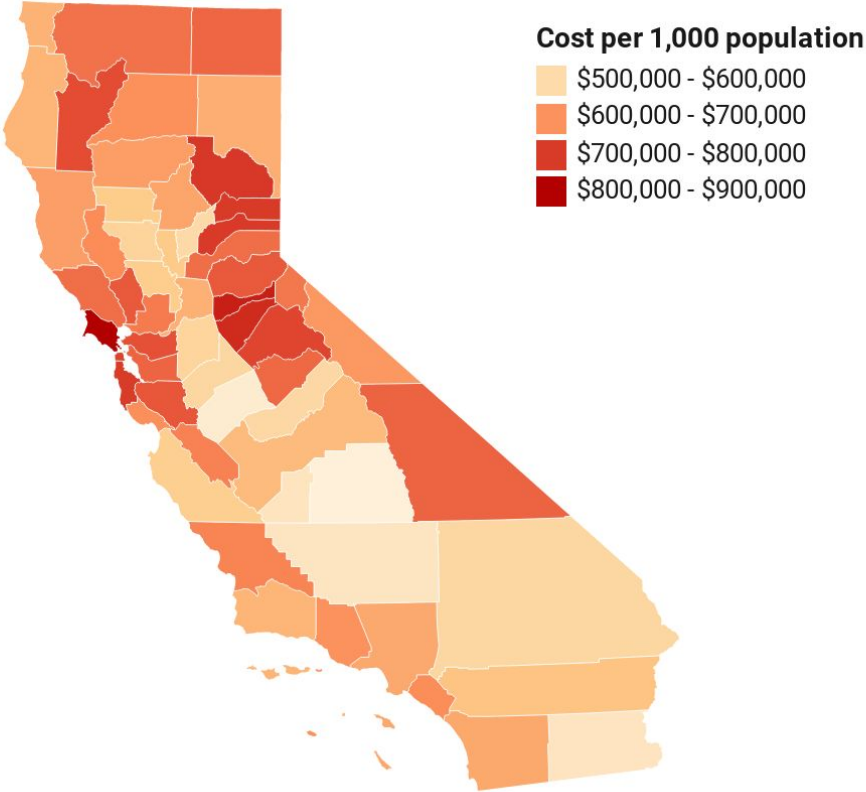
Figure E1 shows the estimated per capita current and potential costs per 1,000 population. Estimated current costs per 1,000 population are over \$70,000 in nine counties (Marin, San Mateo, Calaveras, San Francisco, Plumas, Nevada, Amador, Contra Costa, and Santa Clara) and under \$55,000 in ten counties (Tulare, Alpine, Merced, Kern, Colusa, Kings, Imperial, Madera, Yuba, and Stanislaus). For the potential cost scenario, estimated costs per 1,000 population range from about \$500,000 to \$900,000.

Figure E1: COVID-19 Health Care Costs per 1,000 population by County, 2020

Estimates of current costs per 1,000 population - 5% prevalence



Estimates of potential costs per 1,000 population - 60% prevalence

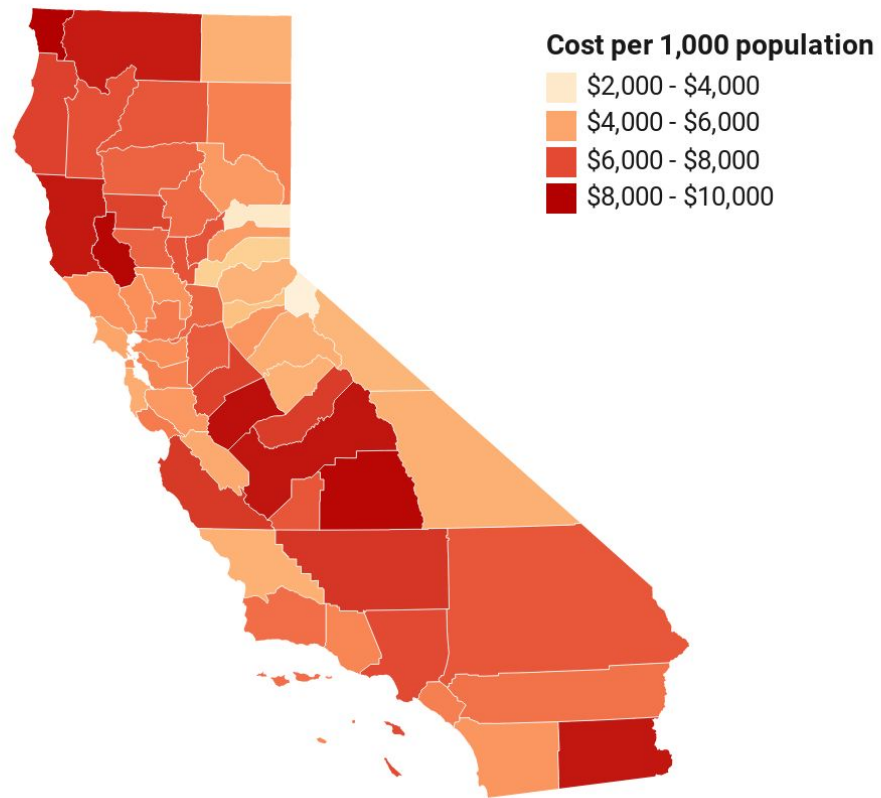


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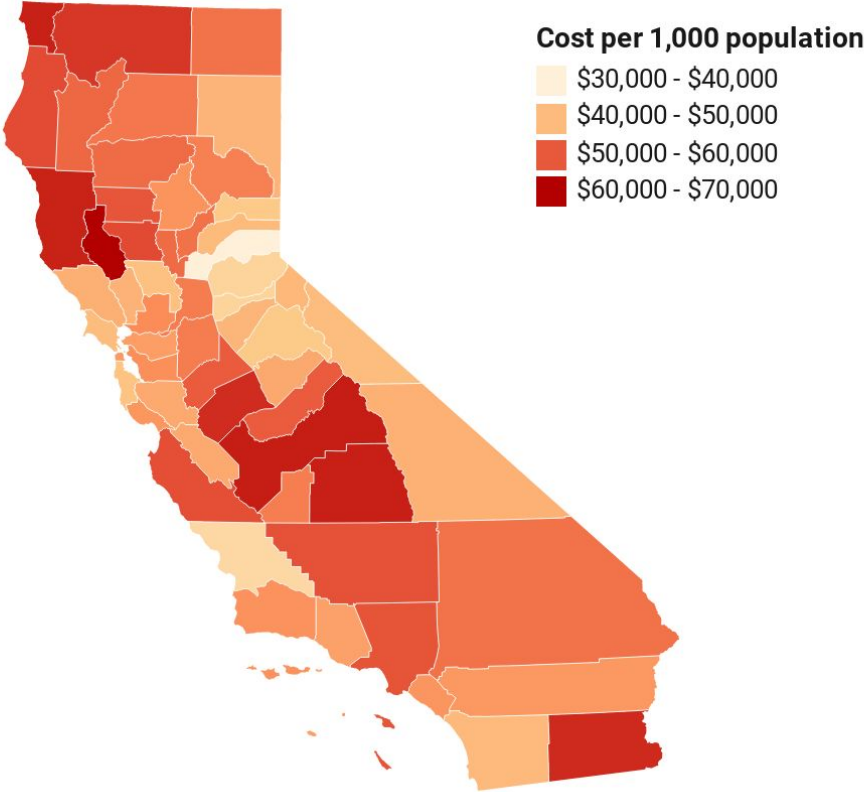
Given Medi-Cal represented 17% of the state's General Fund spending in 2018-2019 (Health Management Associates, 2019), state and county policymakers may be particularly interested in the current and potential costs we estimate for the Medi-Cal program. Figure E2 presents these estimates by county. Current estimated Medi-Cal costs per 1,000 population range from \$2,725 to \$8,409 and are highest in Del Norte (\$8,409), Lake (\$8,279), and Tulare (\$8,271).

Figure E2: COVID-19 Medi-Cal Costs per 1,000 population by County, 2020

Estimates of current Medi-Cal costs per 1,000 population - 5% prevalence



Estimates of potential Medi-Cal costs per 1,000 population - 60% prevalence



Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HeathLeaders-Interstudy).

We will update the costing tool developed for this analysis as new information about the prevalence and health care utilization and costs are reported for California.

Introduction

SARS-CoV-2 and the disease it causes, COVID-19, has put tremendous pressure on California's health care system. While hospital bed capacity has not been exceeded, as early estimates suggested, California hospitals are still experiencing significant costs due to COVID-19. The goal of the analysis in this report is to estimate the health care costs of treating COVID-19 in California at the state- and county-levels.⁸

As of June 15, there have been 153,560 confirmed COVID-19 cases in California, including 73,705 (48%) in Los Angeles County (California Department of Public Health, 2020). Riverside, San Diego, Orange County, and San Bernardino counties have the next most cases at 7,000 - 11,000 each. Eight counties still have fewer than 10 cases. These large differences in case counts across counties necessitate a county-by-county analysis on the impact of COVID-19 on California health care costs.

There are also significant differences in the age and race/ethnicity of the people testing positive for COVID-19 (Table 1). The cases to date are disproportionately over age 18 (93%) and Latino (56%). The people who have died from COVID-19 are disproportionately male (56%), over age 65 (78%), Black (10%), and Latino (40%) (Table 2). The counties that have higher proportions of these groups are bound to have higher health care costs as a result of COVID-19.

⁸ For details on how COVID-19 has impacted hospital utilization and revenues more generally in California, see Melnick and Maerki (2020).

Table 1: Demographics of Positive COVID-19 Cases in California (data as of June 15, 2020)

	Percent of Positive Cases	Percent of Population
Gender		
Female	49%	50%
Male	50%	50%
Age		
0-17	7%	23%
18-49	54%	45%
50-64	22%	18%
65+	16%	14%
Race/Ethnicity		
Asian	8%	15%
Black	5%	7%
Latino	56%	39%
White	18%	37%
Other	14%	2%
Number	153,560	39,927,315

Source: COVID-19 positive cases from the California Department of Public Health. COVID-19 Public Dashboard. Accessed June 16, 2020.

https://public.tableau.com/views/COVID-19PublicDashboard/Covid-19Public?%3Aembed=y%3Adisplay_count=no%3AshowVizHome=no Population data from the Census.

Notes: Percentages may not add to 100% due to rounding.

Table 2: Demographics of COVID-19 Deaths in California (data as of June 15, 2020)

	Percent of Deaths	Percent of Population
Gender		
Female	44%	50%
Male	56%	50%
Age		
0-17	0%	23%
18-49	6%	45%
50-64	16%	18%
65+	78%	14%
Race/Ethnicity		
Asian	15%	15%
Black	10%	7%
Latino	40%	39%
White	33%	37%
Other	3%	2%
Number	5,121	39,927,315

Source: COVID-19 deaths from the California Department of Public Health. COVID-19 Public Dashboard. Accessed June 16, 2020.

https://public.tableau.com/views/COVID-19PublicDashboard/Covid-19Public?%3Aembed=y&%3Adisplay_count=no&%3AshowVizHome=no

Notes: Percentages may not add to 100% due to rounding.

Ultimately, the extent of COVID-19 health care costs in California depends on the percent of Californians that become infected. Antibody test studies performed in Santa Clara and Los Angeles counties during early- to mid-April 2020 suggest the prevalence was in the range of 2.5-5.0% (Bendavid et al., 2020; Sood et al., 2020). Based on these estimates, we use a prevalence of 5% to calculate current COVID-19 health care costs in California. We use a 60% prevalence -- the prevalence epidemiologists generally consider the lower threshold needed in order to achieve herd immunity (Popovich and Sanger-Katz, 2020) -- to estimate potential COVID-19 health care costs in California. Results for 15% and 30% prevalence scenarios are available in the appendix.

The rest of this report proceeds as follows. First, we discuss the data and methods used in our analysis. Next, we present the results of our analysis at the state and county levels. Finally, we conclude by discussing the results.

Data and Methods

We estimate the health care costs of COVID-19 in California using estimated amounts paid under the assumption of a 5% (“current”) and a 60% (“potential”) prevalence. Our use of a 5% prevalence is based on the results of recent antibody tests performed in Santa Clara County and Los Angeles County (Bendavid et al., 2020; Sood et al., 2020). Our use of 60% is based on the prevalence epidemiologists generally consider the lower threshold needed in order to achieve herd immunity (Popovich and Sanger-Katz, 2020). Results for 15% and 30% prevalence scenarios are available in the appendix.

Health Care Utilization

We assume the same utilization of services as outlined in Fiedler and Song (2020). First, we assume every person infected receives one COVID-19 test and one office visit. We additionally assumed an additional 10% of people in each county seek testing to rule out infection.

After an infected person receives a test and has an office visit, the probability of having an emergency department (ED) visit is assumed to be the same as the probability of being hospitalized in each age group. The costs of these ED visits are in addition to the costs of ED visits that lead to hospitalization, which are included in our estimates of the costs of hospitalization.

The hospitalization rate by age group was calculated by Fiedler and Song (2020) using data from New York City. Specifically, the authors first estimated the number of New York City residents infected using data reported in Sutton et al. (2020) on the results of COVID-19 testing among women presenting for delivery at a pair of hospitals in New York City between March 22 and April 4. Second, they converted Sutton et al.’s estimate of the share of women testing positive for COVID-19 to estimate the cumulative prevalence. Third, the authors adjusted for geographic differences between the Sutton et al. study population and the population of New York City as a whole. Ultimately, the authors estimated the number of New York City residents infected to be approximately 20%. They then compared the estimated number of infected people implied by the prevalence to the number of COVID-19 hospitalizations by age reported by the New York City Department of Health and Mental Hygiene to calculate the hospitalization rates shown in Table 3.

The authors note several uncertainties included in their hospital rate calculations. First, the sample of pregnant women studied by Sutton et al. may not be representative of New York City as a whole, even after their adjustments. Additionally, hospitalization patterns for New York City could be an imperfect guide to what may occur in the rest of the U.S.

The hospitalization rates we’ve adopted from Fiedler and Song (2020) are notably lower than those reported in early publications from the Centers for Disease Control and Prevention (CDC) (CDC, 2020a, 2020b), which were subsequently used in analyses that estimated the cost of COVID-19 around that time (Bartsch et al. 2020, Cohen et al. 2020). The early CDC reports

calculated hospitalizations as a share of people with laboratory-confirmed COVID-19, which significantly overstates hospitalization rates as many people with milder cases of COVID-19 were not definitively diagnosed. The age-specific probabilities of infected individuals receiving each of the services outlined in this section are shown in Table 3.

Since the beginning of the pandemic, about 0.4% of Californians (153,560 as of June 15, 2020) have been diagnosed with COVID-19. This markedly underestimates the true number of infections that have occurred.⁹ Those infected may have no or mild symptoms (asymptomatic or minimally symptomatic), moderate symptoms (e.g. shortness of breath) or severe symptoms (e.g. survival dependent upon treatment in an intensive care unit). It is likely that most individuals who develop long term sequelae come from those with moderate or severe symptoms.

In California, 29% of the currently hospitalized confirmed and suspected positive COVID-19 patients (on June 18, 2020) are being cared for in an ICU and will likely need a ventilator (California Department of Public Health, 2020; CDC, 2020a). Age is the most prominent determinate for the severity of infection and death (see Table 3).

Table 3: Probability of Infected Person Receiving Each Service by Age Group

	Ages 0-19	Ages 20-44	Ages 45-64	Ages 65-84	Ages 85+
COVID-19 Tests	100%	100%	100%	100%	100%
Outpatient Visits					
Office Visits	100%	100%	100%	100%	100%
ED Visits	0.09%	0.7%	2.6%	5.9%	7.0%
Hospitalization	0.09%	0.7%	2.6%	5.9%	7.0%
The Following Probabilities Are Conditional on Being Hospitalized					
w/o ventilator	70%	70%	70%	70%	70%
w/ ventilator	30%	30%	30%	30%	30%

Source: Authors' analysis of data in Fiedler and Song (2020).

Health Care Service Prices

We assign prices to services shown in Table 3 by payer because the cost of these services differs by the insurance status of the infected individuals. We adjust the national prices reported in Fiedler and Song (2020) to account for health care prices being higher in California than the rest of the country (Scheffler et al., 2019) (see Table 4).¹⁰

⁹ <https://covid19.healthdata.org/united-states-of-america>

¹⁰ ACA Marketplace plans are included in commercial.

The price for Medicare COVID-19 tests are assumed to be \$100 based on CMS' announcement for tests performed using "high throughput" technologies (CMS, 2020a). Commercial prices are assumed to also be \$100 based on research showing commercial prices for laboratory services are similar to Medicare prices (Trish et al., 2017). Uninsured test prices -- along with all outpatient and inpatient prices -- are assumed to equal those of Medicare due to programs set up under the FFCRA and CARES Act which require providers to accept the Medicare rate as payment in full (Fiedler et al., 2020; Young et al., 2020). Medicaid laboratory service prices were assumed to be 72% of Medicare's following Zuckerman et al. (2017).

The outpatient visit and hospitalization Medicare prices in Table 4 are the national prices reported in Fiedler and Song (2020). The Medicare hospitalization prices were calculated using actual payments in CMS' Inpatient Utilization and Payment Public Use File for fiscal year 2017 in the relevant DRGs, adjusted for changes in the weights of those DRGs and the Inpatient Prospective Payment System base rate since fiscal year 2017. The prices were subsequently increased by 20% as required by the CARES Act and then adjusted further upward by 16% of the pre-CARES Act facility payment to account for the cost of physician services during the hospitalization.

The ratios between commercial/Medicare and Medi-Cal/Medicare prices in Table 4 were set to match the ratios observed in California. A recent paper estimated the ratio of commercial to Medicare prices in California to be 2.26 for inpatient services (i.e., hospitalizations in Table 4) and 2.72 for outpatient services (i.e., outpatient visits in Table 4) (Chernew et al., 2020). A recent MACPAC report estimated the Medicaid to Medicare ratio for 18 high-volume MS-DRGs to be 1.06 including supplemental payments (MACPAC, 2017). The case- and wage-mix adjusted payment level in California was about 1.04 higher than other states, so we used 1.10 (=1.06 x 1.04) as the California Medicaid-to-Medicare reimbursement ratio for hospitalizations. We applied the 0.41 California Medicaid-to-Medicare primary care services ratio reported in Zuckerman et al. (2017) to calculate Medicaid outpatient visit prices. Note, that since the CARES Act increased Medicare hospitalization payments by 20%, the actual commercial-Medicare and Medi-Cal-Medicare hospitalization price ratios in Table 4 are 1.88 (=2.26/1.2) and 0.92 (=1.1/1.2), respectively.

We further adjusted the prices in Table 4 using Medicare's CY 2020 Geographic Adjustment Factors (GAFs) to account for health care prices varying widely across counties in California (Scheffler et al., 2019). Medicare GAFs are a weighted average of three geographic practice cost indices (GPCIs) (physician work, practice expense, and malpractice) and are used to capture price differences over time and across geographic areas (CMS, 2020b). As an example of how we used the GAFs in our analysis, consider an infected person in San Francisco. The CY 2020 GAF for San Francisco is 1.161. Thus, the prices we assigned to this person would be 1.161 times the prices of whichever insurance the person has. GAFs across California counties ranged from 1.025 to 1.185 in CY 2020. The fact that all GAFs in California are above 1 indicates that prices are above the national average in all California counties.

The average price per case in each county will vary due to differences in the payer mix in each county. Using data from DRG's Managed Market Surveyor, we calculated the percent of people in each county that were in each of the four insurance categories shown in Table 4 --

commercial, Medicare, Medi-Cal/CHIP, and uninsured. Overall, payer mix is 47% commercial, 16% Medicare, 29% Medi-Cal/CHIP, and 7% uninsured in California, but it varies widely across counties. The percent of a county’s population that is enrolled in commercial insurance ranges from 16% to 63%. For Medicare, Medi-Cal/CHIP, and uninsured, the ranges are 12-35%, 13-48%, and 4-10%, respectively. We then applied the age-specific payer mix in California (as reported by the American Community Survey) to each county (SHADAC, 2018). As an example, since about 95% of people in California over the age of 65 are reported to be enrolled in Medicare, we assigned almost all of the costs of infected people over the age of 65 to Medicare in each county. Counties where the share of commercial enrollees is high will have higher average prices per case, whereas counties with high Medi-Cal shares will have lower average prices per case. We assume that people of the same age are hospitalized at the same rate, regardless of insurance status.

Table 4: Health Care Prices by Payer of COVID-19 Services in California

	Commercial	Medicare*	Medi-Cal/CHIP	Uninsured
COVID-19 Tests	\$100.00	\$100.00	\$72.00	\$100.00
Outpatient Visits				
Office Visits	\$304.64	\$112.00	\$45.92	\$112.00
ED Visits	\$1,583.04	\$582.00	\$238.62	\$582.00
Hospitalizations				
w/o ventilator	\$31,662.60	\$16,812.00	\$15,411.00	\$16,812.00
w/ ventilator	\$108,898.10	\$57,822.00	\$53,003.50	\$57,822.00

Source: Authors’ analysis of data in Fiedler and Song (2020), Chernew et al. (2020), and Zuckerman et al. (2017).

Notes: *The Medicare prices reported here are the national prices reported in Fiedler and Song (2020). Prices for commercial and Medi-Cal/CHIP are then set to match the commercial-Medicare and Medi-Cal/CHIP-Medicare ratios observed in California. The prices in this table are then multiplied by each county’s Medicare Geographic Adjustment Factor (GAF) to create prices for the county. For instance, the CY 2020 GAF for San Francisco is 1.161. Thus, the prices in this table are multiplied by 1.161 for infected San Franciscans.

Results

Costs for California

Table 5 presents estimates of current and potential costs by payer and service. We estimate current California health care costs due to COVID-19 to be \$2.4 billion -- six times the annual cost of influenza.¹¹ Should 60% of the population of California eventually become infected, roughly the level needed for herd immunity to be achieved, we estimate COVID-19 health care costs would be \$25.1 billion.

The majority of costs (59%) are hospitalization costs. The remaining 41% are divided fairly evenly between COVID-19 test costs and outpatient visits. The percentage of costs that are hospital costs increases to 69% in the potential cost scenario of a 60% prevalence.

By payer, the breakdown in costs is currently 59% commercial, 26% Medicare, 10% Medi-Cal, and 5% uninsured. High prices and large enrollment contribute to commercial being a large share of the total costs. The cost per infected person is \$1,326 for commercial, \$1,774 for Medicare, \$289 for Medi-Cal/CHIP, and \$629 for uninsured.

¹¹ Putri et al. (2018) estimated the direct medical costs of seasonal influenza in the US to be \$3.2 billion in 2015. Using the Consumer Price Index (CPI) to convert this number to 2020 dollars and then multiplying by 12% (California's portion of the US population) leads to an estimate of \$0.42 billion as the direct medical costs of seasonal influenza in California in 2020.

Table 5: California COVID-19 Health Care Cost Estimates by Payer and Service, 2020

Estimates of current costs (\$ Millions) - 5% prevalence

	Commercial	Medicare	Medi-Cal / CHIP	Uninsured	Total
5% prevalence (\$ Millions)					
COVID-19 Tests	\$294.87	\$101.96	\$128.02	\$45.02	\$569.87
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TOTAL	\$1,434.68	\$644.90	\$249.09	\$120.19	\$2,448.85
% of baseline spending	0.9%	0.6%	0.4%	N/A	0.6%

Estimates of potential costs (\$ Millions) - 60% prevalence

	Commercial	Medicare	Medi-Cal / CHIP	Uninsured	Total
60% prevalence (\$ Millions)					
COVID-19 Tests	\$1,301.48	\$450.05	\$565.06	\$198.71	\$2,515.29
Outpatient Visits					
Office Visits	\$3,717.02	\$472.55	\$337.86	\$208.65	\$4,736.07
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Hospitalizations					
w/o ventilator	\$3,915.54	\$2,390.62	\$446.67	\$276.09	\$7,028.91
w/ ventilator	\$5,771.49	\$3,523.77	\$658.38	\$406.96	\$10,360.60
TOTAL	\$14,985.19	\$6,955.20	\$2,017.85	\$1,104.07	\$25,062.31
% of baseline spending	9.7%	6.0%	3.0%	N/A	6.5%

Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HealthLeaders-Interstudy).

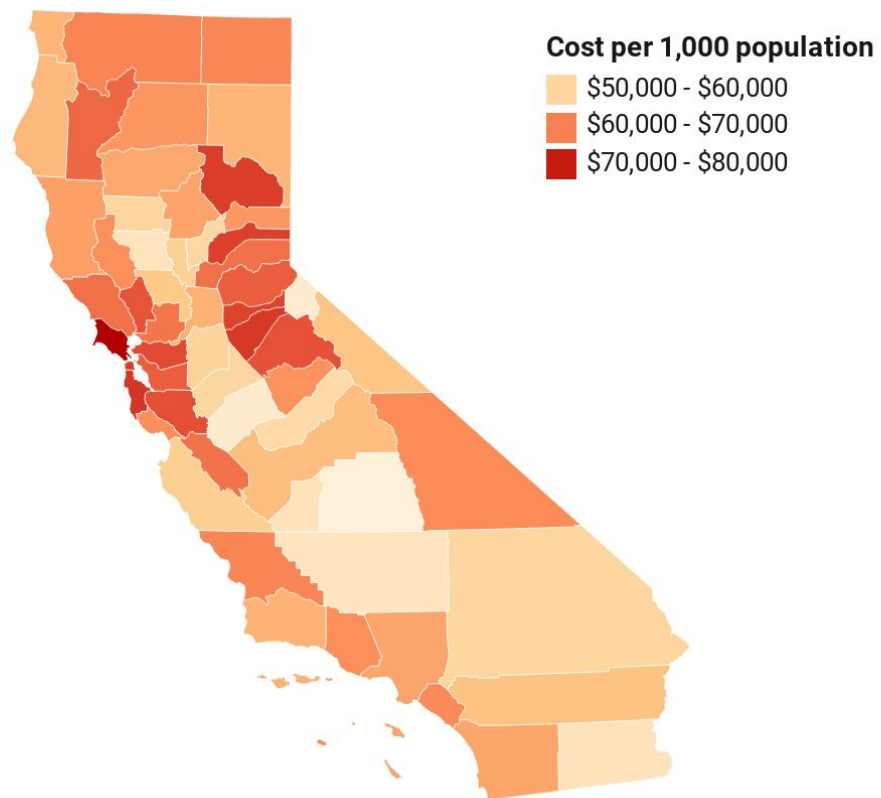
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Costs for California Counties

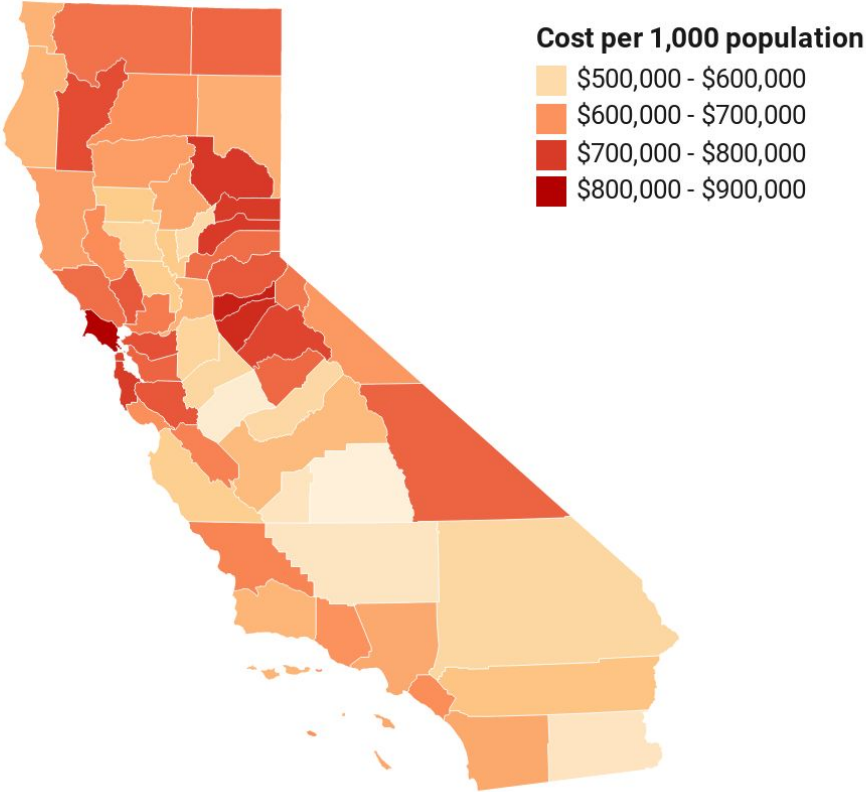
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Figure 1: COVID-19 Health Care Costs per 1,000 population by County, 2020

Estimates of current costs per 1,000 population - 5% prevalence



Estimates of potential costs per 1,000 population - 60% prevalence

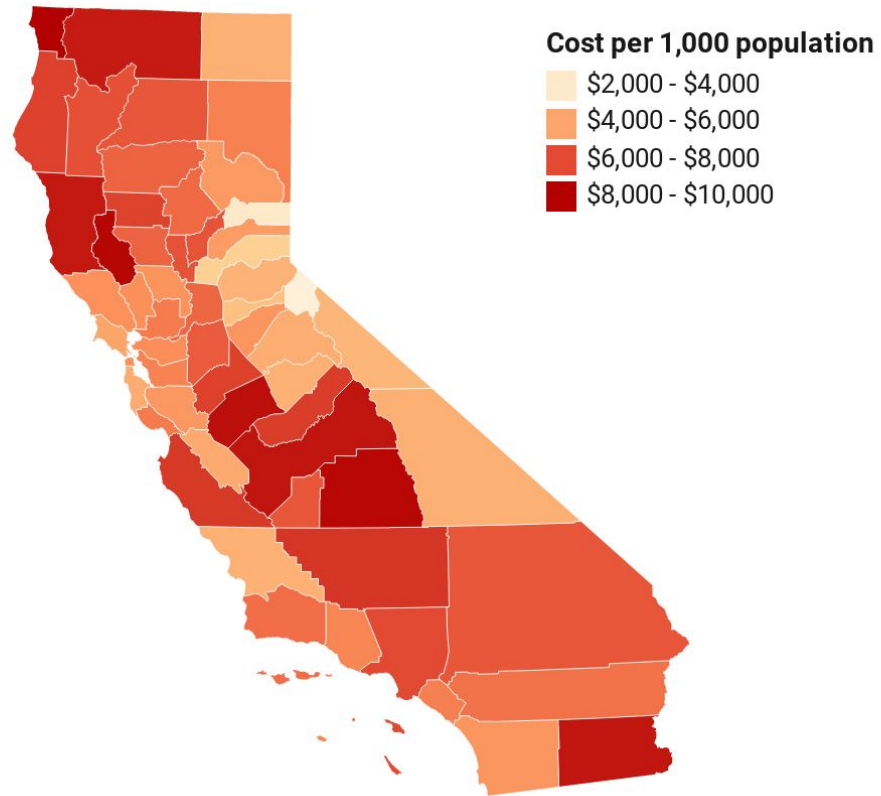


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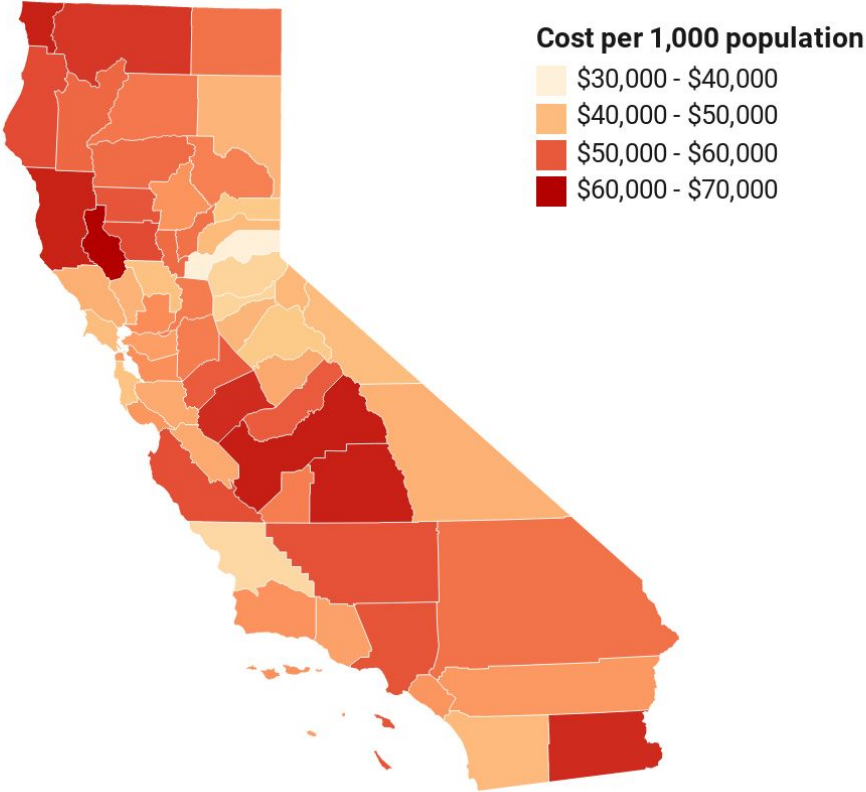
Given Medi-Cal represented 17% of the state's General Fund spending in 2018-2019 (Health Management Associates, 2019), state and county policymakers may be particularly interested in the current and potential costs we estimate for the Medi-Cal program. Figure 2 presents these estimates by county. Current estimated Medi-Cal costs per 1,000 population range from \$2,725 to \$8,409 and are highest in Del Norte (\$8,409), Lake (\$8,279), and Tulare (\$8,271).

Figure 2: COVID-19 Medi-Cal Costs per 1,000 population by County, 2020

Estimates of current Medi-Cal costs per 1,000 population - 5% prevalence



Estimates of potential Medi-Cal costs per 1,000 population - 60% prevalence



Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HeathLeaders-Interstudy).

Summary and Conclusion

Recent studies have reported the prevalence in California to be about 5% prevalence (Bendavid et al., 2020; Sood et al. 2020). Based on this prevalence, we estimated California health care costs due to COVID-19 to be \$2.4 billion -- six times the cost of influenza. Were California to reach a prevalence of 60% -- generally believed to be the lower threshold of what is needed for herd immunity -- we estimated COVID-19 health care costs would be \$25.1 billion.

Estimated costs per 1,000 population varied widely by county due to differences in health care prices and payer mix. Assuming a 5% prevalence, we estimated current costs per 1,000 population of over \$70,000 in nine counties (Marin, San Mateo, Calaveras, San Francisco, Plumas, Nevada, Amador, Contra Costa, and Santa Clara) and under \$55,000 in ten counties (Tulare, Alpine, Merced, Kern, Colusa, Kings, Imperial, Madera, Yuba, and Stanislaus). Medi-Cal costs per 1,000 populated showed a different pattern of counties at the top and bottom. Under a 5% prevalence scenario, we estimated Medi-Cal costs per 1,000 to be over \$8,000 in four counties (Del Norte, Lake, Tulare, and Merced) and under \$4,500 in four counties (Alpine, Sierra, Placer, and Amador).

While our paper addresses the known costs from the SARS-CoV-2 pandemic, there is insufficient data to allow us to address the known-unknown risks and the unknown-unknown risks (with apologies to Donald Rumsfeld [speech to the Pentagon, March 31, 2002]).

We know that an ill-defined number of individuals will experience long term sequelae from infection with SARS-CoV-2. While most of these complications occur in the most ill patients, they may also occur in people who are asymptomatic or minimally symptomatic (Meng et al., 2020). These events include permanent anosmia (loss of smell), permanent damage to the heart leading to varying degrees of heart failure (Madjid et al., 2020), scarring of the lungs that compromise the ability to exchange gasses (Wang et al., 2020), blood clots resulting in damage to a variety of organs including the lungs (Leonard-Lorant et al., 2020), brain (strokes) (Asadi-Pooya and Simani, 2020), and kidney (Durvasula et al., 2020) and neurocognitive dysfunction (Mao et al., 2020). Further, we do not know if there will be long term sequelae from children who experience multisystem inflammatory syndrome (MIS-C) (CDC, 2020b).

It is unlikely that we have seen all of the different types of misery that SARS-CoV-2 may cause. During the months of April and May alone several new probable long term complications were first documented. Only time will allow us to identify and quantify the unknown-unknowns. We will update the costing tool developed for this analysis as new information about the prevalence and health care utilization and prices is reported for California.

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Appendix

Estimating Baseline California Health Care Spending in 2020

We extrapolated the California health care spending numbers in CMS' health care expenditures by state of residence 1991-2014 file to generate the estimates of baseline 2020 California health care spending used in this report.¹² As mentioned in the main text, the caveat to these baseline spending projections is that they are based on spending trends that were developing prior to the pandemic.

In 2014, CMS reported private insurance, Medicare, and Medicaid expenditures in California to be \$104 billion, \$65 billion, and \$62 billion, respectively.¹³ We first extrapolated the spending for these three categories by applying their 10-year average annual growth rates (5.4%, 7.4%, and 7.5%, respectively).¹⁴ This generated expenditure estimates of \$142 billion, \$99 billion, and \$95 billion, respectively, in 2020. We then made the following payer-specific adjustments following Fiedler and Song (2020).

- Medicare: We added cost-sharing to the \$99 billion estimate. Specifically, following a study by McArdle and colleagues¹⁵ that found traditional Medicare had an actuarial value of 80% and a Milliman study¹⁶ that found a typical Medicare Advantage plan had an actuarial value of 89%, we added 40% (which is the percent of Medicare Advantage enrollees in California as of 2018)¹⁷ of 11% of \$99 billion and 60% of 20% of \$99 billion to the original \$99 billion estimate. This led to our California baseline Medicare spending estimate of \$116 billion for 2020.
- Medi-Cal/CHIP: First, we reduced the \$95 billion by 34% to remove the spending of dual eligibles because we assumed dual eligibles were covered by Medicare in our analysis.¹⁸ Second, we added California CHIP spending by trending forward 2017 California CHIP spending using the 10-year Medi-Cal spending average annual growth rate of 7.5%. This led to our California baseline Medi-Cal/CHIP spending estimate of \$68 billion for 2020.
- Commercial: First, we removed spending by Medigap and employer plans that fills in Medicare cost sharing from the \$142 billion. We did this by assuming 59% of the

¹²

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsStateHealthAccountsResidence>

¹³ <https://www.chcf.org/publication/california-health-care-spending/>

¹⁴ <https://www.chcf.org/publication/california-health-care-spending/>

¹⁵ <https://www.kff.org/wp-content/uploads/2013/01/7768-02.pdf>

¹⁶

<https://milliman-cdn.azureedge.net/-/media/milliman/pdfs/articles/medicare-advantage-ffs-benefit-value.aspx>

¹⁷

<https://www.kff.org/medicare/state-indicator/enrollees-as-a-of-total-medicare-population/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>

¹⁸

<https://www.kff.org/medicaid/state-indicator/duals-share-of-medicare-spending/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>

cost-sharing calculated for traditional Medicare enrollees falls on private insurers.¹⁹ Second, we subtracted 3.4% of \$142 billion to remove medical spending by property and casualty insurers.²⁰ Finally, we added cost sharing to the total based on a report from the Health Care Cost Institute that stated employer-sponsored insurance paid 85% of enrollees' total spending in 2018.²¹ This led to our California baseline commercial spending estimate of \$154 billion for 2020.

To calculate total baseline spending in California for 2020, we started with the 2014 California total health care spending figure from CMS of \$292 billion. We then extrapolated total spending by applying the California total spending 10-year average annual growth rate of 5.6%. We then subtracted 5.1% of the total spending to remove the share of spending from TRICARE and Veterans Affairs coverage.²² This led to our California baseline total spending estimate of \$384 billion for 2020.

¹⁹

<https://www.kff.org/medicare/issue-brief/sources-of-supplemental-coverage-among-medicare-beneficiaries-in-2016/>

²⁰

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical>

²¹ https://healthcostinstitute.org/images/pdfs/HCCI_2018_Health_Care_Cost_and_Utilization_Report.pdf

²²

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsStateHealthAccountsResidence>

Additional Tables and Figures

Table A1: Costs for 5%, 15%, 30%, and 60% prevalence

	Commercial	Medicare	Medi-Cal / CHIP	Uninsured	Total
5% Prevalence (\$ Millions)					
COVID-19 Tests	\$294.87	\$101.96	\$128.02	\$45.02	\$569.87
Outpatient Visits					
Office Visits	\$309.75	\$39.38	\$28.15	\$17.39	\$394.67
ED Visits	\$23.29	\$10.59	\$0.88	\$1.21	\$35.98
Hospitalizations					
w/o ventilator	\$326.10	\$199.26	\$37.20	\$22.86	\$585.42
w/ ventilator	\$480.67	\$293.71	\$54.83	\$33.70	\$862.91
TOTAL	\$1,434.68	\$644.90	\$249.09	\$120.19	\$2,448.85
15% Prevalence (\$ Millions)					
COVID-19 Tests	\$477.89	\$165.25	\$207.48	\$72.97	\$923.58
Outpatient Visits					
Office Visits	\$929.25	\$118.14	\$84.46	\$52.16	\$1,184.02
ED Visits	\$69.92	\$29.56	\$2.47	\$3.40	\$105.36
Hospitalizations					
w/o ventilator	\$979.00	\$597.72	\$111.60	\$68.81	\$1,757.12
w/ ventilator	\$1,443.05	\$881.04	\$164.49	\$101.42	\$2,590.00
TOTAL	\$3,899.11	\$1,791.71	\$570.50	\$298.75	\$6,560.08
30% Prevalence (\$ Millions)					
COVID-19 Tests	\$752.42	\$260.18	\$326.67	\$114.88	\$1,454.15
Outpatient Visits					
Office Visits	\$1,858.51	\$236.27	\$168.93	\$104.32	\$2,368.04
ED Visits	\$139.81	\$59.12	\$4.94	\$6.83	\$210.70
Hospitalizations					
w/o ventilator	\$1,957.49	\$1,195.35	\$223.21	\$138.13	\$3,514.18
w/ ventilator	\$2,885.34	\$1,417.64	\$329.01	\$203.61	\$4,835.59
TOTAL	\$7,593.56	\$3,168.56	\$1,052.75	\$567.78	\$12,382.66
60% Prevalence (\$ Millions)					

COVID-19 Tests	\$1,301.48	\$450.05	\$565.06	\$198.71	\$2,515.29
Outpatient Visits					
Office Visits	\$3,717.02	\$472.55	\$337.86	\$208.65	\$4,736.07
ED Visits	\$279.67	\$118.23	\$9.88	\$13.65	\$421.43
Hospitalizations					
w/o ventilator	\$3,915.54	\$2,390.62	\$446.67	\$276.09	\$7,028.91
w/ ventilator	\$5,771.49	\$3,523.77	\$658.38	\$406.96	\$10,360.60
TOTAL	\$14,985.19	\$6,955.20	\$2,017.85	\$1,104.07	\$25,062.31

Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HeathLeaders-Interstudy).

Notes: The model assumes all infected individuals plus an additional 10% of the population receive a COVID-19 test. This assumption leads to a less than perfect linear scaling of estimated costs across prevalence.

Table A2: Costs for 5% prevalence by county

County	5% Prevalence Costs (\$ Millions)				
	Commercial	Medicare	MediCal/CHIP	Uninsured	Total
Alameda	\$71.91	\$27.98	\$9.62	\$4.76	\$114.27
Alpine	\$0.01	\$0.04	\$0.00	\$0.00	\$0.06
Amador	\$1.37	\$1.19	\$0.17	\$0.07	\$2.81
Butte	\$7.40	\$4.72	\$1.46	\$0.60	\$14.18
Calaveras	\$1.60	\$1.33	\$0.25	\$0.12	\$3.29
Colusa	\$0.56	\$0.36	\$0.14	\$0.07	\$1.13
Contra Costa	\$49.68	\$21.99	\$6.37	\$3.30	\$81.34
Del Norte	\$0.83	\$0.53	\$0.23	\$0.06	\$1.65
El Dorado	\$7.46	\$4.25	\$0.90	\$0.46	\$13.07
Fresno	\$31.02	\$16.12	\$7.94	\$3.04	\$58.12
Glenn	\$0.77	\$0.49	\$0.20	\$0.09	\$1.55
Humboldt	\$4.06	\$2.58	\$0.97	\$0.43	\$8.04
Imperial	\$4.92	\$2.66	\$1.45	\$0.51	\$9.54
Inyo	\$0.57	\$0.44	\$0.09	\$0.06	\$1.15
Kern	\$26.79	\$10.89	\$6.60	\$2.60	\$46.89
Kings	\$4.80	\$1.72	\$1.02	\$0.41	\$7.94
Lake	\$1.77	\$1.61	\$0.53	\$0.19	\$4.10
Lassen	\$1.08	\$0.48	\$0.18	\$0.09	\$1.83
Los Angeles	\$354.54	\$156.83	\$70.68	\$34.94	\$617.00
Madera	\$4.51	\$2.40	\$1.14	\$0.51	\$8.56
Marin	\$11.44	\$6.69	\$1.30	\$0.72	\$20.15
Mariposa	\$0.56	\$0.41	\$0.08	\$0.05	\$1.11
Mendocino	\$2.37	\$2.06	\$0.69	\$0.28	\$5.41
Merced	\$7.51	\$3.50	\$2.23	\$0.78	\$14.02
Modoc	\$0.24	\$0.27	\$0.04	\$0.01	\$0.56
Mono	\$0.54	\$0.19	\$0.07	\$0.03	\$0.82
Monterey	\$13.31	\$6.50	\$3.18	\$1.51	\$24.51
Napa	\$5.44	\$3.08	\$0.77	\$0.43	\$9.72
Nevada	\$3.51	\$2.84	\$0.52	\$0.27	\$7.14
Orange	\$122.41	\$52.89	\$18.62	\$9.93	\$203.85

Placer	\$15.45	\$8.33	\$1.56	\$0.86	\$26.21
Plumas	\$0.64	\$0.56	\$0.10	\$0.05	\$1.35
Riverside	\$81.40	\$38.27	\$15.00	\$7.29	\$141.97
Sacramento	\$54.30	\$24.11	\$9.82	\$4.12	\$92.35
San Benito	\$2.62	\$0.96	\$0.30	\$0.20	\$4.09
San Bernardino	\$70.77	\$27.83	\$14.60	\$6.31	\$119.50
San Diego	\$124.03	\$52.27	\$17.92	\$10.07	\$204.29
San Francisco	\$39.08	\$17.09	\$4.88	\$2.47	\$63.52
San Joaquin	\$24.09	\$10.62	\$4.97	\$2.04	\$41.73
San Luis Obispo	\$10.22	\$5.98	\$1.35	\$0.76	\$18.32
San Mateo	\$34.90	\$15.06	\$3.72	\$2.14	\$55.82
Santa Barbara	\$14.74	\$7.70	\$2.78	\$1.48	\$26.70
Santa Clara	\$88.30	\$32.23	\$10.25	\$5.27	\$136.06
Santa Cruz	\$10.20	\$4.84	\$1.62	\$0.80	\$17.46
Shasta	\$5.47	\$4.15	\$1.21	\$0.47	\$11.29
Sierra	\$0.09	\$0.08	\$0.01	\$0.00	\$0.19
Siskiyou	\$1.18	\$1.21	\$0.34	\$0.09	\$2.83
Solano	\$17.59	\$8.09	\$2.65	\$1.20	\$29.53
Sonoma	\$18.67	\$10.54	\$2.73	\$1.42	\$33.37
Stanislaus	\$16.77	\$8.03	\$3.93	\$1.42	\$30.14
Sutter	\$2.87	\$1.66	\$0.66	\$0.24	\$5.44
Tehama	\$1.91	\$1.39	\$0.41	\$0.18	\$3.89
Trinity	\$0.39	\$0.36	\$0.09	\$0.02	\$0.85
Tulare	\$12.26	\$5.91	\$3.85	\$1.29	\$23.32
Tuolumne	\$1.86	\$1.54	\$0.26	\$0.15	\$3.81
Ventura	\$31.64	\$14.90	\$4.87	\$2.76	\$54.17
Yolo	\$7.85	\$3.00	\$1.19	\$0.56	\$12.60
Yuba	\$2.40	\$1.14	\$0.53	\$0.20	\$4.26
Total	\$1,434.68	\$644.90	\$249.09	\$120.19	\$2,448.85

Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HealthLeaders-Interstudy).

Table A3: Costs for 15% prevalence by county

County	15% Prevalence Costs (\$ Millions)				
	Commercial	Medicare	MediCal/CHIP	Uninsured	Total
Alameda	\$193.43	\$78.06	\$22.90	\$12.18	\$306.57
Alpine	\$0.09	\$0.07	\$0.01	\$0.00	\$0.17
Amador	\$4.09	\$3.21	\$0.44	\$0.26	\$8.00
Butte	\$20.11	\$13.08	\$3.24	\$1.53	\$37.96
Calaveras	\$4.43	\$3.72	\$0.56	\$0.32	\$9.03
Colusa	\$1.78	\$0.95	\$0.32	\$0.18	\$3.23
Contra Costa	\$134.02	\$61.13	\$15.27	\$8.44	\$218.86
Del Norte	\$2.37	\$1.49	\$0.47	\$0.15	\$4.49
El Dorado	\$20.33	\$11.80	\$2.16	\$1.23	\$35.51
Fresno	\$86.00	\$45.33	\$17.40	\$7.49	\$156.21
Glenn	\$2.20	\$1.38	\$0.44	\$0.20	\$4.22
Humboldt	\$11.27	\$7.16	\$2.21	\$1.01	\$21.65
Imperial	\$13.56	\$7.35	\$3.14	\$1.24	\$25.30
Inyo	\$1.61	\$1.27	\$0.22	\$0.15	\$3.25
Kern	\$73.38	\$30.11	\$14.48	\$6.31	\$124.28
Kings	\$13.00	\$4.70	\$2.22	\$1.06	\$20.99
Lake	\$4.91	\$4.40	\$1.21	\$0.47	\$10.99
Lassen	\$3.02	\$1.33	\$0.40	\$0.18	\$4.92
Los Angeles	\$969.72	\$436.35	\$159.38	\$84.98	\$1,650.43
Madera	\$12.57	\$6.68	\$2.51	\$1.18	\$22.94
Marin	\$31.10	\$18.66	\$3.17	\$1.88	\$54.81
Mariposa	\$1.65	\$1.16	\$0.21	\$0.14	\$3.16
Mendocino	\$6.71	\$5.63	\$1.52	\$0.68	\$14.54
Merced	\$20.82	\$9.69	\$4.76	\$1.90	\$37.18
Modoc	\$0.67	\$0.69	\$0.13	\$0.06	\$1.56
Mono	\$1.45	\$0.60	\$0.15	\$0.11	\$2.31
Monterey	\$36.66	\$18.11	\$7.04	\$3.65	\$65.46
Napa	\$14.71	\$8.56	\$1.78	\$1.03	\$26.08
Nevada	\$9.59	\$7.85	\$1.25	\$0.69	\$19.38
Orange	\$331.44	\$147.13	\$43.56	\$24.73	\$546.87

Placer	\$41.52	\$23.16	\$3.90	\$2.31	\$70.89
Plumas	\$1.68	\$1.58	\$0.27	\$0.13	\$3.66
Riverside	\$221.08	\$106.54	\$33.99	\$17.87	\$379.48
Sacramento	\$148.04	\$66.49	\$22.42	\$10.41	\$247.36
San Benito	\$6.87	\$2.63	\$0.80	\$0.48	\$10.78
San Bernardino	\$192.84	\$76.88	\$32.59	\$15.52	\$317.83
San Diego	\$334.40	\$144.95	\$42.12	\$25.01	\$546.49
San Francisco	\$105.24	\$47.65	\$11.80	\$6.44	\$171.13
San Joaquin	\$65.57	\$29.28	\$11.10	\$5.09	\$111.05
San Luis Obispo	\$27.66	\$16.61	\$3.19	\$1.93	\$49.38
San Mateo	\$93.47	\$42.14	\$9.25	\$5.56	\$150.41
Santa Barbara	\$40.12	\$21.29	\$6.29	\$3.59	\$71.29
Santa Clara	\$235.98	\$90.09	\$24.91	\$13.72	\$364.70
Santa Cruz	\$27.54	\$13.46	\$3.73	\$1.98	\$46.71
Shasta	\$15.21	\$11.49	\$2.67	\$1.21	\$30.58
Sierra	\$0.31	\$0.25	\$0.04	\$0.01	\$0.62
Siskiyou	\$3.43	\$3.33	\$0.71	\$0.31	\$7.78
Solano	\$47.50	\$22.28	\$6.23	\$3.09	\$79.10
Sonoma	\$50.93	\$29.23	\$6.42	\$3.67	\$90.23
Stanislaus	\$46.06	\$22.19	\$8.68	\$3.59	\$80.52
Sutter	\$8.01	\$4.57	\$1.50	\$0.67	\$14.75
Tehama	\$5.36	\$3.82	\$0.97	\$0.42	\$10.57
Trinity	\$1.04	\$1.04	\$0.19	\$0.07	\$2.35
Tulare	\$34.08	\$16.25	\$8.23	\$3.24	\$61.81
Tuolumne	\$5.29	\$4.19	\$0.64	\$0.36	\$10.49
Ventura	\$85.74	\$41.19	\$11.37	\$6.77	\$145.07
Yolo	\$20.88	\$8.42	\$2.73	\$1.36	\$33.39
Yuba	\$6.61	\$3.04	\$1.18	\$0.52	\$11.34
Total	\$3,899.11	\$1,791.71	\$570.50	\$298.75	\$6,560.08

Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HealthLeaders-Interstudy).

Table A4: Costs for 30% prevalence by county

County	30% Prevalence Costs (\$ Millions)				
	Commercial	Medicare	MediCal/CHIP	Uninsured	Total
Alameda	\$375.72	\$75.94	\$42.77	\$23.39	\$517.82
Alpine	\$0.18	\$1.75	\$0.01	\$0.00	\$1.95
Amador	\$7.82	\$11.50	\$0.84	\$0.51	\$20.66
Butte	\$39.28	\$14.83	\$5.95	\$2.98	\$63.05
Calaveras	\$8.67	\$4.39	\$1.06	\$0.62	\$14.73
Colusa	\$3.37	\$45.01	\$0.66	\$0.33	\$49.37
Contra Costa	\$260.16	\$60.99	\$28.61	\$16.18	\$365.94
Del Norte	\$4.59	\$9.40	\$0.86	\$0.35	\$15.21
El Dorado	\$39.60	\$50.06	\$4.13	\$2.39	\$96.18
Fresno	\$168.53	\$44.19	\$31.58	\$14.20	\$258.50
Glenn	\$4.27	\$6.46	\$0.85	\$0.41	\$11.98
Humboldt	\$22.10	\$13.13	\$4.01	\$1.94	\$41.17
Imperial	\$26.58	\$8.08	\$5.70	\$2.34	\$42.70
Inyo	\$3.33	\$30.94	\$0.40	\$0.25	\$34.92
Kern	\$143.14	\$34.82	\$26.25	\$11.99	\$216.20
Kings	\$25.36	\$7.15	\$4.08	\$2.00	\$38.58
Lake	\$9.71	\$5.57	\$2.14	\$0.90	\$18.32
Lassen	\$6.04	\$373.47	\$0.75	\$0.37	\$380.63
Los Angeles	\$1,892.11	\$430.90	\$292.46	\$160.16	\$2,775.63
Madera	\$24.46	\$17.23	\$4.53	\$2.30	\$48.52
Marin	\$60.40	\$18.97	\$6.01	\$3.68	\$89.07
Mariposa	\$3.28	\$4.49	\$0.42	\$0.23	\$8.42
Mendocino	\$13.07	\$14.55	\$2.72	\$1.29	\$31.62
Merced	\$40.67	\$9.83	\$8.57	\$3.61	\$62.68
Modoc	\$1.44	\$1.25	\$0.24	\$0.11	\$3.04
Mono	\$2.93	\$15.56	\$0.32	\$0.21	\$19.01
Monterey	\$71.71	\$23.16	\$12.78	\$6.87	\$114.52
Napa	\$28.58	\$12.81	\$3.30	\$2.03	\$46.72
Nevada	\$18.76	\$128.68	\$2.31	\$1.33	\$151.07
Orange	\$645.01	\$159.33	\$80.94	\$46.88	\$932.17

Placer	\$80.69	\$23.46	\$7.42	\$4.49	\$116.07
Plumas	\$3.35	\$86.96	\$0.47	\$0.26	\$91.04
Riverside	\$430.39	\$163.46	\$62.46	\$33.81	\$690.12
Sacramento	\$288.58	\$67.88	\$41.34	\$19.94	\$417.74
San Benito	\$13.33	\$87.20	\$1.49	\$0.90	\$102.93
San Bernardino	\$375.78	\$198.69	\$59.65	\$29.37	\$663.49
San Diego	\$649.88	\$177.61	\$78.46	\$47.38	\$953.33
San Francisco	\$204.33	\$75.67	\$22.13	\$12.34	\$314.48
San Joaquin	\$127.73	\$39.39	\$20.30	\$9.65	\$197.08
San Luis Obispo	\$53.93	\$46.19	\$6.04	\$3.73	\$109.89
San Mateo	\$181.32	\$58.16	\$17.50	\$10.68	\$267.66
Santa Barbara	\$78.13	\$95.63	\$11.50	\$6.70	\$191.97
Santa Clara	\$457.33	\$99.34	\$46.88	\$26.52	\$630.07
Santa Cruz	\$53.83	\$20.46	\$6.94	\$3.80	\$85.04
Shasta	\$29.95	\$11.62	\$4.95	\$2.30	\$48.82
Sierra	\$0.61	\$1.96	\$0.06	\$0.04	\$2.67
Siskiyou	\$6.72	\$20.28	\$1.32	\$0.61	\$28.93
Solano	\$92.45	\$43.02	\$11.60	\$5.93	\$153.00
Sonoma	\$99.19	\$48.45	\$11.99	\$7.05	\$166.68
Stanislaus	\$89.88	\$25.30	\$15.80	\$6.86	\$137.83
Sutter	\$15.77	\$6.88	\$2.69	\$1.29	\$26.63
Tehama	\$10.44	\$4.32	\$1.81	\$0.82	\$17.40
Trinity	\$2.17	\$15.80	\$0.35	\$0.21	\$18.53
Tulare	\$66.61	\$18.23	\$14.79	\$6.08	\$105.70
Tuolumne	\$10.23	\$35.83	\$1.23	\$0.69	\$47.98
Ventura	\$166.88	\$48.26	\$21.10	\$12.82	\$249.05
Yolo	\$40.45	\$10.98	\$5.09	\$2.63	\$59.15
Yuba	\$12.78	\$3.08	\$2.15	\$0.99	\$18.99
Total	\$7,593.56	\$3,168.56	\$1,052.75	\$567.78	\$12,382.66

Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HealthLeaders-Interstudy).

Table A5: Costs for 60% prevalence by county

County	60% Prevalence Costs (\$ Millions)				
	Commercial	Medicare	MediCal/CHIP	Uninsured	Total
Alameda	\$740.11	\$303.38	\$82.62	\$45.77	\$1,171.88
Alpine	\$0.35	\$0.34	\$0.05	\$0.01	\$0.75
Amador	\$15.50	\$12.45	\$1.65	\$1.02	\$30.63
Butte	\$77.46	\$50.55	\$11.37	\$5.79	\$145.16
Calaveras	\$17.08	\$14.49	\$2.08	\$1.24	\$34.89
Colusa	\$6.72	\$3.63	\$1.22	\$0.61	\$12.19
Contra Costa	\$512.77	\$237.41	\$55.32	\$31.66	\$837.16
Del Norte	\$8.99	\$5.68	\$1.67	\$0.69	\$17.03
El Dorado	\$78.13	\$45.65	\$7.99	\$4.79	\$136.56
Fresno	\$333.64	\$176.77	\$59.97	\$27.66	\$598.04
Glenn	\$8.56	\$5.35	\$1.55	\$0.79	\$16.25
Humboldt	\$43.77	\$27.82	\$7.67	\$3.75	\$83.00
Imperial	\$52.56	\$28.38	\$10.76	\$4.46	\$96.15
Inyo	\$6.47	\$4.90	\$0.83	\$0.48	\$12.68
Kern	\$282.73	\$116.62	\$49.86	\$23.19	\$472.39
Kings	\$49.95	\$18.23	\$7.77	\$3.99	\$79.95
Lake	\$19.43	\$17.07	\$4.05	\$1.81	\$42.36
Lassen	\$11.85	\$5.02	\$1.41	\$0.73	\$19.01
Los Angeles	\$3,737.38	\$1,694.88	\$558.62	\$310.33	\$6,301.22
Madera	\$48.59	\$25.89	\$8.61	\$4.35	\$87.44
Marin	\$119.20	\$72.59	\$11.65	\$7.13	\$210.57
Mariposa	\$6.43	\$4.51	\$0.82	\$0.45	\$12.20
Mendocino	\$26.13	\$21.82	\$5.25	\$2.56	\$55.75
Merced	\$80.37	\$37.45	\$16.21	\$6.97	\$141.00
Modoc	\$2.80	\$2.65	\$0.46	\$0.25	\$6.16
Mono	\$5.77	\$2.35	\$0.64	\$0.41	\$9.17
Monterey	\$141.64	\$70.28	\$24.34	\$13.20	\$249.47
Napa	\$56.50	\$33.02	\$6.40	\$3.96	\$99.88
Nevada	\$37.04	\$30.57	\$4.50	\$2.60	\$74.71
Orange	\$1,272.22	\$571.38	\$155.74	\$91.22	\$2,090.56

Placer	\$158.91	\$89.88	\$14.47	\$8.84	\$272.10
Plumas	\$6.64	\$6.04	\$0.96	\$0.50	\$14.15
Riverside	\$849.08	\$413.84	\$119.41	\$65.61	\$1,447.94
Sacramento	\$570.03	\$257.75	\$79.17	\$38.93	\$945.88
San Benito	\$26.32	\$10.29	\$2.88	\$1.76	\$41.25
San Bernardino	\$741.78	\$297.74	\$113.75	\$57.01	\$1,210.28
San Diego	\$1,280.95	\$562.44	\$151.09	\$92.09	\$2,086.55
San Francisco	\$402.75	\$185.13	\$42.87	\$24.30	\$655.05
San Joaquin	\$252.17	\$113.61	\$38.68	\$18.70	\$423.16
San Luis Obispo	\$106.30	\$64.36	\$11.68	\$7.25	\$189.58
San Mateo	\$357.10	\$163.93	\$33.99	\$20.83	\$575.85
Santa Barbara	\$154.21	\$82.64	\$22.04	\$13.07	\$271.96
Santa Clara	\$900.29	\$350.51	\$90.84	\$51.81	\$1,393.44
Santa Cruz	\$106.28	\$52.09	\$13.40	\$7.41	\$179.18
Shasta	\$59.30	\$44.35	\$9.36	\$4.58	\$117.60
Sierra	\$1.10	\$0.96	\$0.13	\$0.05	\$2.24
Siskiyou	\$13.41	\$12.89	\$2.54	\$1.20	\$30.03
Solano	\$182.34	\$86.25	\$22.31	\$11.58	\$302.48
Sonoma	\$195.84	\$113.31	\$23.10	\$13.69	\$345.93
Stanislaus	\$177.70	\$85.89	\$30.03	\$13.34	\$306.96
Sutter	\$30.95	\$17.68	\$5.14	\$2.53	\$56.30
Tehama	\$20.79	\$14.88	\$3.39	\$1.66	\$40.72
Trinity	\$4.30	\$3.88	\$0.67	\$0.33	\$9.17
Tulare	\$131.95	\$63.17	\$28.00	\$11.77	\$234.89
Tuolumne	\$20.22	\$16.32	\$2.37	\$1.38	\$40.30
Ventura	\$329.40	\$159.76	\$40.66	\$24.93	\$554.75
Yolo	\$79.70	\$32.70	\$9.78	\$5.14	\$127.32
Yuba	\$25.23	\$11.81	\$4.09	\$1.92	\$43.05
Total	\$14,985.19	\$6,955.20	\$2,017.85	\$1,104.07	\$25,062.31

Source: Authors' analysis of data in Fiedler and Song (2020), Chernew et al. (2020), Zuckerman et al. (2017), and DRG's Managed Market Surveyor (formerly HealthLeaders-Interstudy).