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Forecasts and Drivers of Health Expenditure Growth in California

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Abstract

California's state government, employers, and households are concerned about the future affordability of healthcare. We use health expenditure data from the Centers for Medicare & Medicaid Services' Office of the Actuary to forecast California's health expenditures from 2013 to 2022 and identify factors driving expenditure increases. Real health expenditures per capita (2013$) are forecasted to increase from $8,398 to $11,421 (or 36 percent), resulting in health expenditures increasing from 14.5 percent to 16.0 percent of California's economy. Expenditure increases are mostly driven by gains in real income per capita (40–60 percent), followed by medical-specific inflation (23 percent), an aging population (14 percent), and insurance coverage gains (8 percent). The -4 percent to 16 percent residual is attributable to changes in the volume and mix of services and technology. Several innovations could potentially dampen these increases, such as shared-risk, value-based payment models, practice redesign initiatives, lower cost settings and healthcare professionals, many of which are found in accountable care organizations.

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I. Introduction

California's state government, employers, and households are concerned about the future affordability of healthcare in California. The Affordable Care Act is likely to have opposing effects on health expenditures. On the one hand, the number uninsured in California is forecasted to decrease from 6.0 million to 2.6 million between 2011 and 2016, leading to increased expenditures (California Simulation of Insurance Markets 2014). On the other hand, payment and delivery innovations within the Affordable Care Act and private market have the potential to reduce expenditures (McClellan 2014), but there is a concern that provider consolidation may lead to higher prices (Health Care Cost Institute 2014; Baker et al. 2014; Robinson 2011; Berenson et al. 2010).

In the United States, health expenditures are forecasted to grow at 5.6 percent in 2014 and are forecasted to grow at an average of 6.0 percent per year during 2015–2023 (Sisko et al. 2014). These new forecasts show that health expenditures' share of the nation's gross domestic product (GDP) is forecasted to increase from 17.2 percent to 19.3 percent from 2013–2023.

In this article, we focus on forecasting health expenditures in California and analyzing the factors driving the expenditure increases. First, we forecast health expenditures in California from 2013–2022 using the Berkeley Forum Healthcare Expenditure Forecasting Model (Scheffler et al. 2013). Second, we estimate the impact of the key factors driving health expenditure growth and discuss each factor's contribution. Third, we discuss innovations, with a focus on accountable care organizations, which could potentially dampen forecasted health expenditure increases.

This study occurred as part of the Berkeley Forum for Improving California's Healthcare Delivery System, a collaboration between the state's healthcare leaders and the School of Public Health at University of California, Berkeley. In February 2013, the Berkeley Forum released its main report, *A New Vision for California's Healthcare System: Integrated Care with Aligned Financial Incentives* (Scheffler et al. 2013), which was also published in *California Journal of Politics and Policy* (Scheffler et al. 2014). The journal's issue included an article that discussed the formation of the Berkeley Forum and the process that led to the Berkeley Forum's vision, which calls for reducing the share of expenditures paid for on a fee-for-service basis while increasing the share of the population receiving care from fully or highly integrated care systems (Bowers et al. 2014a). Furthermore, Bowers et al. (2014b) introduces six commentaries by Berkeley Forum participants and other healthcare leaders that reflect on the Berkeley Forum process that led to its

vision as well as the key healthcare issues that California faces (Bodaken 2014; Coye and Skootsky 2014; Halvorson 2014; Kehaly 2014; Morrison 2014; Yegian and Williams 2014).

II. Data and Methods

This section summarizes our data sources and methods. Additional details can be found in the December 2014 Berkeley Forum report *Drivers of Health Expenditure Growth in California: Forecasts and Progress on Delivery System Integration* (Fulton et al. 2014) as well as Scheffler et al. (2013).

1. Data

We used two key health expenditure datafiles from the Centers for Medicare & Medicaid Services (CMS). First, at the United States level, we used CMS's *National Health Expenditure (NHE) Amounts by Type of Expenditure and Source of Funds: Calendar Years 1960–2023* datafile that was released in September 2014 (CMS 2014a; Sisko et al. 2014). This datafile is the most recently published datafile that provides a continuous series of historical and forecasted health expenditure estimates. Details of CMS's methods and actuarial assumptions are available in its methodology report (CMS 2014b). Our analysis uses the 1990–2022 period, which is based on historical expenditures for 1990–2012 and forecasted expenditures for 2013–2022. Second, at the California level, we used CMS's *Health Expenditures by State of Residence, 1991–2009* datafile that was released in 2011 and provides historical expenditures for 1990–2009 (CMS 2011). This datafile will not be updated until 2016, because it is based on information from the Economics Census that is conducted every five years.

We used population forecasts from California Department of Finance, as of January 2013 (California Department of Finance 2013); and used economic forecasts from the US Bureau of Economic Analysis, as of June 2014 (US Bureau of Economic Analysis 2014), which is the release that most closely matches the timing of July 2014 national GDP estimates included in the national CMS datafile (CMS 2014a).

2. Methods

To forecast health expenditures in California for 2013–2022, we forecasted personal healthcare expenditures and nonpersonal health expenditures separately.[1] We compared personal healthcare expenditures per capita between the United States and California from 2000–2009. Although California's personal healthcare expenditures per capita have historically been lower than the United States' average, the annual growth rate trends between California and the United States were similar from 2000–2009. Therefore, to forecast California's personal healthcare expenditures per capita, we applied CMS's United States personal healthcare expenditures per

[1] CMS categorizes health expenditures into two subcategories: health consumption and investment (CMS 2014b). Health consumption includes personal healthcare, government administration, net cost of health insurance, and government public health activities. Investment categories include research, structures, and equipment. In this article, health expenditures include total health consumption and investment expenditures, but it separates personal healthcare expenditures from nonpersonal health expenditures. The latter includes government administration, net cost of health insurance, government public health activities, as well as investment in research, structures, and equipment.

capita annual growth rates to California for 2010–2022.[2] As CMS does not provide estimates of nonpersonal health expenditures at the state level, we assumed that California's nonpersonal health expenditures per capita would be the same as the United States' per capita average. Then, to obtain California's total health expenditures per capita, we added California's forecasted personal healthcare expenditures per capita to the United States nonpersonal health expenditures per capita. Expenditures are forecasted in current-year dollars (also called nominal dollars), meaning they do not control for economy-wide or medical-specific inflation.

To estimate the impact of factors that drive forecasted health expenditure increases, we primarily relied upon the method discussed in Smith et al. (2009). We converted our forecasted current-year health expenditures per capita into real expenditures in 2013 dollars, using the US GDP Implicit Price Deflator trended forward using a univariate ordinary least squares model. The real health expenditure per capita increases are influenced by medical-specific inflation, an aging population, insurance coverage, income growth, and a residual that primarily includes a combination of changes in the volume and mix of services, changes in the use of cost-increasing and cost-decreasing technology, and measurement error. These factors are interrelated, particularly insurance coverage, income, and technology.

Medical-specific inflation is a significant driver of the growth in personal healthcare spending (Health Care Cost Institute 2014; Truffer et al. 2010; Peterson and Burton 2007) and has consistently outpaced economy-wide inflation. Medical-specific inflation refers to the growth in medical-specific prices above and beyond economy-wide inflation (Martin et al. 2014). Medical-specific inflation was estimated from the Personal Health Care Chain-Type Price Index, developed by the CMS Office of the Actuary. Between 2013 and 2022, medical-specific inflation is forecasted to increase an additional 6.6 percent beyond economy-wide inflation.

California's population is forecasted to age, which will result in higher healthcare expenditures per capita (California Department of Finance 2013; CMS 2014c). Between 2013 and 2022, the California Department of Finance forecasts that the share of people aged 65+ will increase from 12.1 percent to 15.2 percent of the population (California Department of Finance 2013). We isolated the aging impact by assuming personal healthcare spending per capita by age-sex group in 2013 stayed the same through 2022, and calculated the expenditure per capita difference between the 2013 population and the older 2022 population.

Under the Affordable Care Act, the number of uninsured Californians is forecasted to decrease from 6.0 million to 2.6 million between 2011 and 2016, resulting in lower out-of-pocket costs and higher expenditures (California Simulation of Insurance Markets 2014; Hadley et al. 2008). This coverage expansion contributes to the forecasted decrease in the share of healthcare expenditures paid for out-of-pocket, which is estimated to decrease from 13.8 percent to 11.8 percent of expenditures between 2013 and 2022. This estimated decrease is based on CMS out-of-pocket forecasts for the United States applied to California (CMS 2014a). To estimate the impact of the out-of-pocket share decrease on real expenditures per capita, we assumed a price elasticity of expenditures of negative 0.17, based on an estimate from the RAND Health Insurance Experiment (Newhouse and The Insurance Experiment Group 1993; Keeler et al. 1988).

As a country's income increases, its spending on health increases as well (Getzen 2000). The US Bureau of Economic Analysis forecasts GDP for the United States, which on a per-capita basis, is a proxy for income (US Bureau of Economic Analysis 2014). We applied United States GDP per capita annual growth rates to forecast California's GDP per capita between 2013 and

[2] The latest historical health expenditure estimate for California is for 2009; therefore, we applied the United States per capita growth rate from 2010–2022.

2022, resulting in California's forecasted GDP per capita increasing from $57,785 to $81,822. In real 2013 dollars, based on the forecasted US GDP Implicit Price Deflator, the forecasted increase is from $57,785 to $71,547 (or 24 percent). The income elasticity of healthcare expenditures has been estimated in a number of studies (e.g., Getzen 2000), and we used a range of 0.6 to 0.9 based on Smith et al. (2009), because their estimate was based on superior methods that removed the potential income-price interaction and the range was consistent with other studies we reviewed.

The residual is the share of real health expenditure per capita growth that has not been accounted for by the factors above. The residual includes changes in the volume and mix of services, changes in the use of cost-increasing and cost-decreasing technology, and measurement error. The volume and mix of services are changing because of payment and delivery system reforms, leading to lower expenditures in some cases (e.g., Melnick et al. 2014; Scheffler et al. 2013; Markovich 2012). On the other hand, technology, on net, has historically been cost increasing, because of new treatments (Newhouse 1992). Technology can be cost-decreasing when it increases productivity, such as with electronic medical records providing clinicians the information they need to better manage care for high-cost patients (Hillestad et al. 2005; Wang et al. 2003).

III. Results

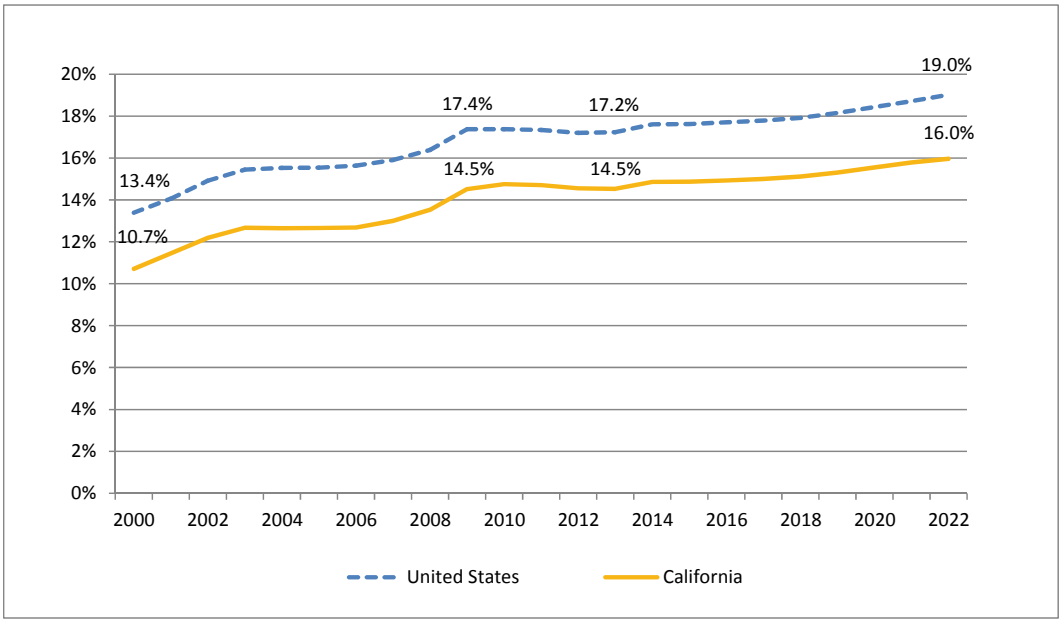
The results include our health expenditure forecasts for California from 2013 to 2022 and our estimates of the factors that drive of health expenditure growth.

1. Health Expenditure Forecasts

Figure 1 shows health expenditures as a percentage of GDP in California and the United States from 2000–2022. During this period, health spending as a share of the economy is approximately 2.5 to 3.0 percentage points lower in California than the United States. In 2013, health expenditures represented 14.5 percent of the California's economy, and that share is forecasted to increase to 16.0 percent by 2022. Health expenditures per capita are forecasted to increase at a higher rate than they did in the recent recessionary years, but not as fast as the prior period. The moderate growth will occur as the economy recovers, while potential expenditure-reducing payment and delivery innovations scale up. However, the forecasted growth rate is about 1.1 percentage points more than the forecasted economic growth rate per capita. The annual health expenditure per capita and GDP per capita growth rates for California are as follows for the three key periods: 2000–2008: health expenditures per capita of 6.7 percent versus GDP per capita of 3.6 percent; 2008–2013: health expenditures per capita of 2.8 percent versus GDP per capita of 1.3 percent; and 2013–2022: health expenditures per capita of 5.0 percent versus GDP per capita of 3.9 percent.

Figure 2 shows historical and forecasted health expenditures per capita and annual growth rates in California from 2000–2022. From 2013–2022, health expenditures per capita are forecasted to increase from $8,398 to $13,061, or 5.0 percent per year. This growth rate is less than the 2008–2013 growth rate of 2.8 percent, which was lower because of the December 2007 to June 2009 recession. However, the forecasted growth rate is lower than the 6.7 percent growth rate that occurred in the 2000–2008 period prior to the recession. On an aggregate basis, health expenditures are forecasted to increase from $320 billion to $540 billion between 2013 and 2022,

Figure 1. Health Expenditures as a Percentage of Gross Domestic Product in California and the United States, 2000–2022



Notes: United States health expenditures are historical from 2000–2012 and forecasted thereafter. California health expenditures are historical from 2000–2009 and forecasted thereafter.

Source: Berkeley Forum analysis using Centers for Medicare and Medicaid Services datafiles (CMS 2014a, 2011). See Fulton et al. (2014) and Appendix III: "California Cost Curve, Healthcare Expenditures and Premium Projections (Methodology)" in Scheffler et al. (2013) for sources and additional details.

a period when California's population is forecasted to increase from 38.1 million to 41.4 million (California Department of Finance 2013).

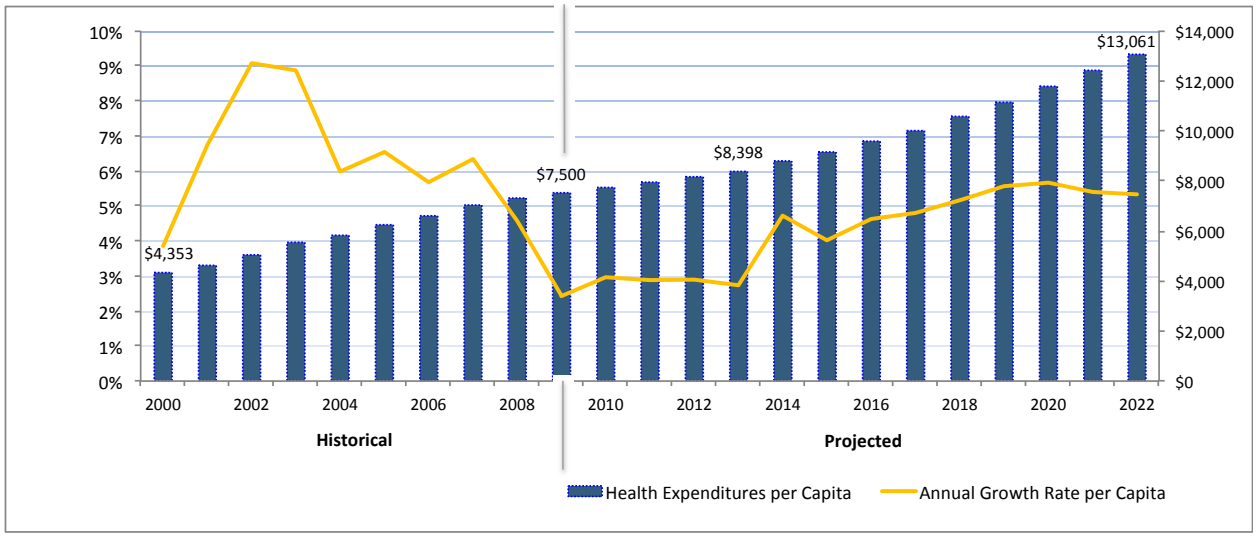
2. Estimating the Impact of Factors Driving Health Expenditure Increases

In the section above, we forecasted that health expenditures per capita in California will increase from $8,398 to $13,061 between 2013 and 2022. We converted these current-year dollar amounts into real 2013 dollars using forecasts of the US GDP Implicit Price Deflator, which resulted in a real increase from $8,398 to $11,421, totaling $3,023 (or 36 percent).[3] Similar to Smith et al. (2009), we estimated how medical-specific inflation, an aging population, insurance coverage, and income growth contributed to this $3,023 real increase.

Figure 3 shows how each of these factors contributes to the real health expenditure per capita increase of $3,023 between 2013 and 2022, for income elasticity of expenditures being 0.6 and 0.9. For either income elasticity, medical-specific inflation contributes 23.4 percent, population aging contributes 13.7 percent, and insurance coverage contributes 7.5 percent. When income

[3] Real health expenditures adjust current-year dollar health expenditures for economy-wide inflation, as estimated from the US GDP Implicit Price Deflator trended forward using an univariate ordinary least squares model.

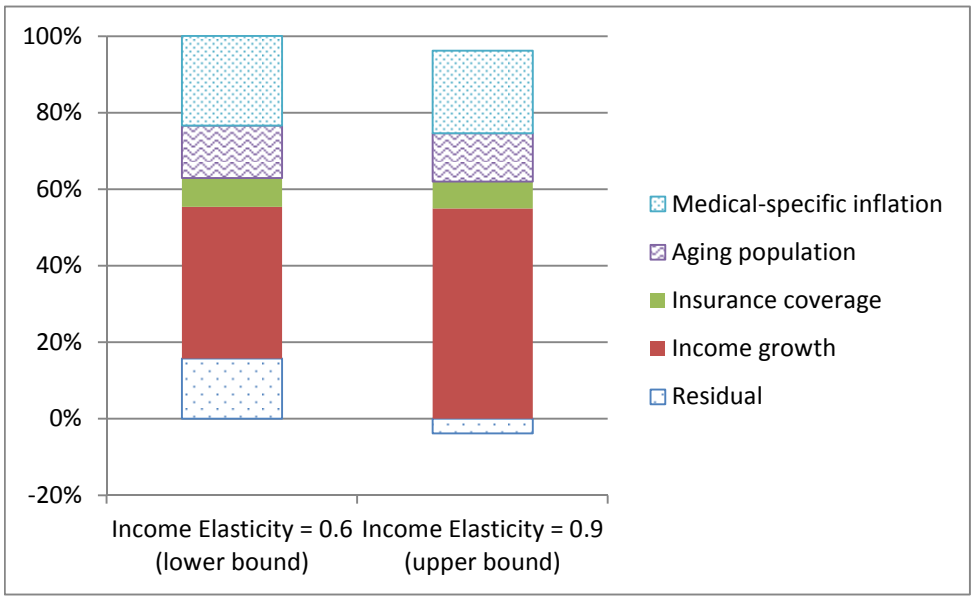
Figure 2. Health Expenditures per Capita and Growth Rates in California, 2000–2022



Notes: The reported expenditures are in nominal (current-year) dollars. Health expenditures are historical from 2000–2009 and forecasted thereafter.

Source: Berkeley Forum analysis using Centers for Medicare and Medicaid Services datafiles (CMS 2014a, 2011). See Fulton et al. (2014) and Appendix III: "California Cost Curve, Healthcare Expenditures and Premium Projections (Methodology)" in Scheffler et al. (2013) for sources and additional details.

Figure 3. Factors' Contributions to the Growth in Forecasted Real Health Expenditures per Capita in California, 2013–2022



Notes: The residual includes changes in the volume and mix of services, changes in the use of cost-increasing and cost-decreasing technology, and measurement error.

Source: Berkeley Forum analysis. See Fulton et al. (2014) for additional details.

elasticity is assumed to be 0.6, income growth contributes 39.7 percent and the residual is 15.7 percent; and when income elasticity is assumed to be 0.9, income growth contributes 59.5 percent and the residual is -4.2 percent, which means the residual contributes to expenditure decreases.[4] A negative residual could mean that cost-increasing technologies are more than offset by cost-decreasing technologies coupled with a lower cost volume and mix of services; however, other explanations are possible. As a residual category, it contains any measurement error, and to the extent error exists in other factor estimates, it will also be accounted for here.

IV. Discussion

In California, real health expenditures per capita (2013$) are forecasted to increase from $8,398 to $11,421 (or 36 percent) between 2013 and 2022, resulting in health expenditures increasing from 14.5 percent to 16.0 percent of the economy. Expenditure increases are mostly driven by gains in real income per capita (40–60 percent), followed by medical-specific inflation growing faster than overall economy-wide inflation (23 percent), an aging population (14 percent), and insurance coverage gains (8 percent). The -4 percent to 16 percent residual is attributable to changes in the volume and mix of services and technology.

Our estimated contributions of each factor, when we use our lower-bound income elasticity results, are somewhat—but not always—consistent with recent United States and California estimates (Hartman et al. 2015; Martin et al. 2014; Wilson 2014; Smith et al. 2009). The differences are mainly because we evaluate different time periods, and are sometimes because we use different methods. Hartman and colleague analyzed United States health spending per capita from 2009–2013. Population aging, the only directly comparable factor, accounts for approximately one-sixth of their growth, consistent with our estimate of 14 percent. Their nonprice factors, which include our insurance coverage, income growth, and the residual, accounted for less than our estimates during 2009 to 2011, likely because this period occurred just after the December 2007 to June 2009 recession when income growth was relatively lower, while our period of analysis forecasts stronger income growth.

Smith et al. (2009), who estimated the impact of factors that contributed to real health spending per capita growth in the United States from 1960–2007, separately accounted for insurance coverage, income growth and the residual. Insurance coverage expansion accounted for 8 percent to 11 percent of expenditure increases, consistent with our 8 percent estimate. Given that the out-of-pocket share of expenditures decreased from 55 percent to 14 percent between 1960 and 2007, one would have thought insurance would have had a greater impact in their study. However, real spending per capita increased approximately nine-fold over their period—versus 1.4-fold during our period—so an 8 percent to 11 percent impact is still significant. They estimated real income growth to account for between 29 percent and 43 percent of expenditure increases, somewhat lower than our 40 percent to 60 percent estimate. Finally, they estimated medical-specific inflation accounted for between 5 percent and 19 percent of expenditure increases, lower than our estimate of 23 percent. However, our estimate is based on the now-available Personal Health Care Chain-Type Price Index developed by the CMS Office of the Actuary, which was not available for their study.

[4] The share of the residual's contribution to real health spending per capita growth is equal to 100 percent minus the sum of the shares of the other factors' contributions.

1. Examining the Residual and the Impact of the Great Recession

After accounting for the factors above, the remaining residual is a combination of changes in the volume and mix of services, changes in the use of cost-increasing and cost-decreasing technology, and measurement error. Depending on the income elasticity of expenditure that is used, these factors sum to a range from positive 16 percent (when the lower-bound income elasticity of 0.6 is used) to negative 4 percent (when the upper-bound income elasticity of 0.9 is used), the latter of which means their net effect decreases expenditures. This residual is much smaller than the 27 percent to 48 percent residual estimated by Smith et al. (2009), which they attributed to a technology-income interaction and a technology residual. However, they analyzed United States health expenditures in a much earlier period, from 1960–2007. There is some evidence that expenditure-reducing structural changes may be occurring within the health sector that partially offset cost-increasing technology.

Health expenditure growth in the United States has slowed during 2009–2013 period (Hartman et al. 2015), and researchers continue to debate the influence of the December 2007 to June 2009 recession versus structural changes on this slower growth. There is some agreement that part of the national trend in slower growth is likely due to expenditure-reducing structural changes, however the estimates range from 30 percent to 55 percent. Dranove et al. (2014) conclude that the recession primarily explained 70 percent of the observed slower growth, with the remaining 30 percent explained by structural changes. The implications of their findings suggest that, absent any other changes, health spending will begin to increase under the economic recovery. However, the researchers note that the different estimates of the impact of the recession depend on how researchers define the timing and severity of the recession. Cutler and Sahni examined the slower health spending growth from 2003-2012, and concluded that the recession only explained 37 percent of the slowdown, 8 percent was due to Medicare payment reductions, while 55 percent was unexplained (Cutler and Sahni 2013). Cutler and Sahni attribute a larger role to this unexplained portion, and indicate that it was likely due to greater provider efficiency, increased consumer cost-sharing, and a slower development of medical technology and pharmaceuticals. In a similar study, Chandra et al. (2013) do not quantify the role of the recession, but find that the following factors were responsible for the slowdown: higher out-of-pocket prices for health care due to increased high-deductible health plan enrollment and the loss of private insurance coverage; states restricting Medicaid benefits and reducing provider reimbursements; and slower deployment of new technology. Finally, a recent study analyzed health spending trends from 1990 to 2013, which included three recessionary periods, and found health spending as a share of GDP was mostly stable during nonrecessionary periods, with the share mainly increasing during recessionary periods (Hartman et al. 2015). The authors note that it is uncertain whether health spending growth in the immediate future will increase at the same pace as the recovering economy, as it has in past postrecessionary periods.

2. Innovations with the Potential to Reduce the Rate of Health Expenditure Growth

Healthcare payers are striving to increase the efficiency of the healthcare system and reduce unnecessary care. These efforts could dampen the impact of some of the factors that are forecasted to contribute to health expenditure growth, such as an aging population and the residual, which includes the volume and mix of services and technology. There is a need for innovations in care delivery, including practice redesign to improve care for elderly populations with multiple chronic illnesses, provision of care in lower cost settings using lower cost personnel, further

development of patient-centered medical homes, and expanded use of palliative care that honors patient wishes.

Accountable care organizations (ACO) have great potential to increase value-based care, because they are formed by partnering organizations, including physician organizations, hospitals, and payers, to organize care and share financial risk with the goals of reducing costs while improving healthcare quality and patient outcomes. In California, the number of ACOs has increased from 26 to 67 (or 158 percent), between August 2012 and February 2014 (Fulton et al., 2015). As of February 2014, 2.4 percent of the total state population, including 10.6 percent of Medicare fee-for-service beneficiaries and 2.3 percent of the privately insured population were attributed to an ACO. ACO-like arrangements are increasing, such as Anthem Blue Cross of California and seven healthcare systems recently entering into an ACO-like arrangement known as "Vivity" (Evans 2014).

The proliferation of ACOs in California, as well as other financial risk sharing between health plans and providers, has sometimes led to expenditure reductions through changes in utilization and service mix (e.g., Melnick et al. 2014; Scheffler et al. 2013; Markovich 2012). In a number of instances, the savings are realized through lower utilization and a less expensive service mix, such as the shift from inpatient care to outpatient visits, as well as the use of generic drugs over brand names. Although ACOs and ACO-like arrangements have produced savings, the results are not always consistent (e.g., Kocot et al. 2014; Colla et al. 2012). Moreover, there is a concern that provider consolidation may lead to higher prices, potentially increasing the impact of medical-specific inflation on expenditure growth (Health Care Cost Institute 2014; Baker et al. 2014; Robinson 2011; Berenson et al. 2010). For more information on ACOs, see the Berkeley Forum's report entitled *Accountable Care Organizations in California: Promise and Performance* (Shortell et al. 2015).

Finally, an aging population will have an increased demand for palliative care, which is associated with improved patient-centered outcomes, such as reduced pain and depression, as well as improved patient and family satisfaction and lower costs (Meier 2011). A recent study estimated that if the share of eligible patients receiving community based palliative care increased from 12 percent to 50 percent by 2022, there would be a $1.1 billion reduction in healthcare expenditures in 2022 (Kessell et al. 2014).

V. Conclusion

California's state government, employers, and households are concerned about the future affordability of healthcare in California. Our work shows that, despite improvements in the trajectory of health spending per capita, health spending is still on course to outpace economic growth and will cost another $3,023 in inflation-adjusted dollars per person by 2022. To address expenditure increases in a systematic way, the Berkeley Forum recommends its vision, which calls for reducing the share of expenditures paid for on a fee-for-service basis while increasing the share of the population receiving care from fully or highly integrated care systems. These innovations, coupled with other payment and delivery system innovations often implemented within accountable care organizations, have the potential to help Californians have more affordable health care.

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