Medi-Cal Expenditures: Historical Growth and Long Term Forecasts

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Summary

Over the past five years, total Department of Health Services expenditures on Medi-Cal, California's Medicaid program, have risen by a third in real terms. Medi-Cal costs are now over $33 billion annually, with about $12 billion drawn from the General Fund and the remainder primarily from federal funds. Medi-Cal spending currently constitutes about 15 percent of all expenditures from the state's General Fund, second only to K-12 education. Other states are facing even higher expenditures on Medicaid as a share of total revenues, and predictions suggest that this spending will continue to grow as a share of state budgets. Many states, including New York, Florida, and Tennessee, have already considered dramatic changes in their Medicaid programs in an effort to contain costs. Meanwhile, the federal government is proposing cuts to the Medicaid program, including strategies to shift costs back to the states.

In light of the rapid growth in Medi-Cal expenditures experienced since 2000, California is also seeking strategies to rein in Medi-Cal costs. In the absence of any policy changes, the most recent trends suggest that Medi-Cal will take an ever-increasing fraction of California's General Fund budget. However, there are reasons to suspect that several of the factors principally responsible for the recent high growth of Medi-Cal expenditures will not sustain this rapid growth into the near future. Part of the recent experience reflects expansion in program eligibility and benefit enhancements whose effects have now been entirely phased in. In addition, California experienced a downturn in its economy shortly after 2000, which normally leads to expansion of the Medi-Cal rolls.

To assess the fiscal challenges Medi-Cal may pose in the future for California policymakers, three questions must be addressed: First, how much are Medi-Cal costs likely to grow over the next decade in the absence of policy changes? Second, how will this growth compare to revenue growth? And third, what factors are driving Medi-Cal costs?

This paper answers these questions by forecasting the expected costs of the Medi-Cal program through 2015, as well as examining the forces underlying recent growth in Medi-Cal expenditures.[1] Our approach counts costs in the year services are provided, rather than the year claims are paid, which means that by construction our forecasts are not comparable to the approach used by the California Department of Health Services in its short-term projections. Because our historical data end in 2003 and our projections are long-term in nature, we do not report results for the near-term (2004 through 2008). The forecast uses a flexible modeling framework to predict future costs of benefits under both fee-for-service and managed care Medi-Cal. This analysis aims to provide a baseline forecast, which can then serve as reference for future projections that consider Medi-Cal expenditures under alternative policy scenarios. As a benchmark, the forecasting approach relies heavily on the growth rates in the National Health Expenditure projections developed by the Centers for Medicare and Medicaid Services for the National Health Accounts. Because the projections assume no change in current policies, they do not include proposals related to Medi-Cal redesign nor effects of the new Medicare drug benefits.

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[1] By convention, throughout the paper, 1997 refers to the 1996-97 fiscal year, 2015 to the 2014-15 fiscal year and so forth. We use the terms 'costs' and 'expenditures' interchangeably.

Figure S.1 summarizes our baseline forecast of Medi-Cal expenditures out to the year 2015. This figure graphs three sets of projections: (1) total Medi-Cal expenditures on benefits paid out by the fee-for-service and managed care systems, (2) total Medi-Cal expenditures combining the payments for fee-for-service (FFS) and managed care systems with the costs of other program components (such as dental and mental health), and (3) Medi-Cal spending forecast to be paid for by the state General Fund. Figure S.2 translates projections (3) into the fraction of General Fund revenues represented by this level of Medi-Cal spending.

Figure S.1
Actual and Projected Fee-for-Service (FFS) and Managed Care Benefits, Total Medi-Cal Expenditures and General Fund Medi-Cal Expenditures, 1997 to 2015
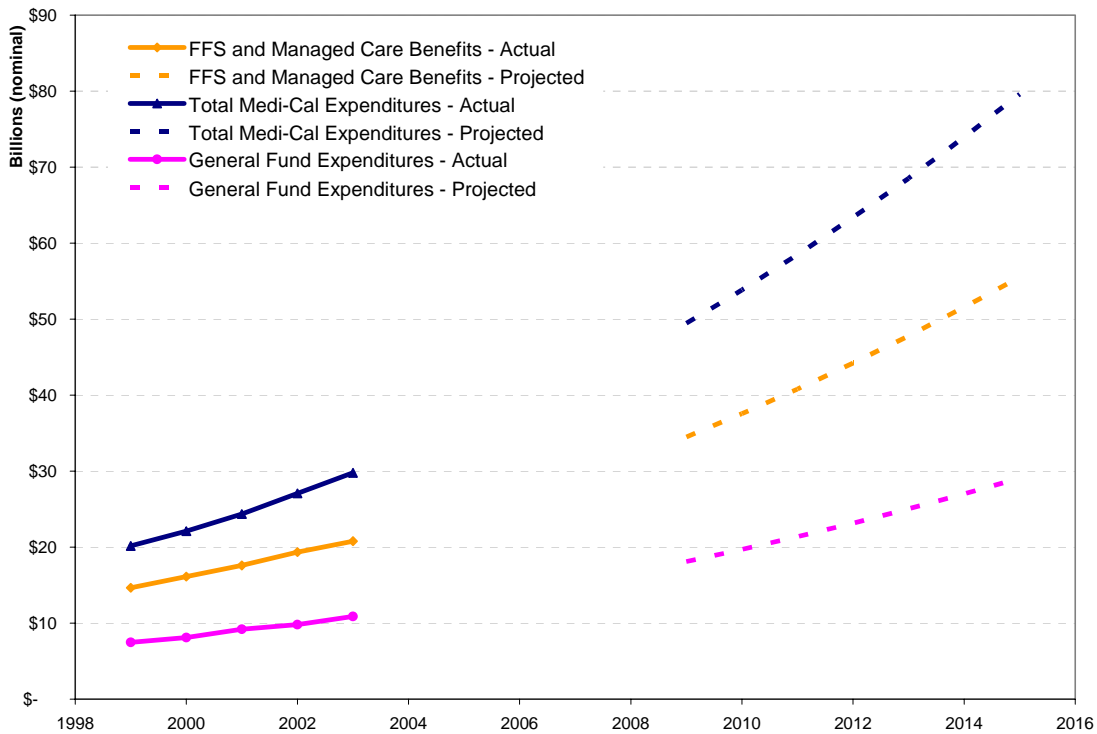
Our analysis projects that Medi-Cal benefit expenditures will grow by approximately 8.5 percent annually over the next ten years. In 2010, the forecasts indicate that the total cost of the Medi-Cal program will rise to $53.9 billion, $19.7 billion of which would be paid by the state. By 2015, these totals will rise further to $79.6 billion, with $29.1 billion out of the General Fund. Within the Medi-Cal program, our analysis forecasts that the service categories with the fastest growth in average expenditures will be physician visits and prescription drugs. Hospital costs will fall as a share of all Medi-Cal expenditures. Our projections reveal only minor differences in the rate of expenditure-growth for children, adult, or elderly age cohorts. Because the vast majority of baby boomers will not reach age 65 by 2015, the aging of the population does not drive the projected increase in expenditures. However, overall population growth will lead to an increase in the number of enrollees, and this accounts for about 17 percent of the increase in benefit expenditures.

At 8.5 percent, the average growth in Medi-Cal expenditures will outpace the expected 6 percent annual growth in state revenues projected by the Legislative Analyst's Office. Accordingly, Medi-Cal can be expected to absorb a growing share of the overall General Fund budget, rising from 15 percent in 2003 to 19 percent in 2010 and 21 percent in 2015. In 2010, forecasts indicate that Medi-Cal will require an additional $3.7 billion over and above the costs expected if Medi-Cal expenditures remained a constant share of state revenues.

Figure S.2
Actual and Projected General Fund Medi-Cal Expenditures
as Share of General Fund Revenues, 2003, 2010, 2015
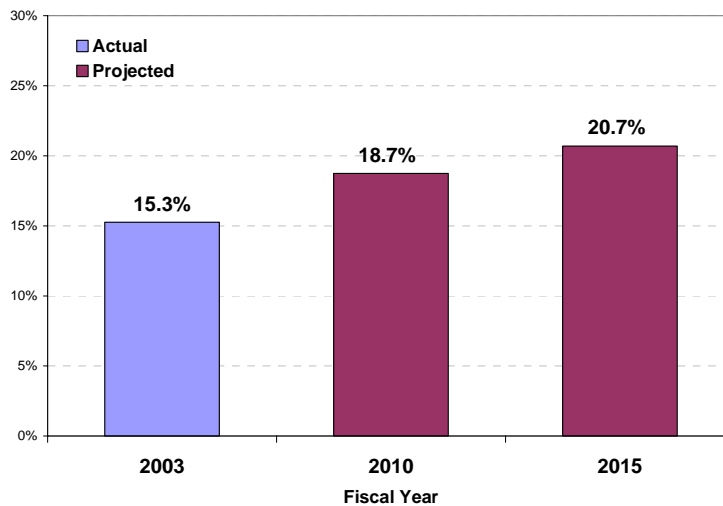
California has typically had about 10 percent slower growth in health care spending than the national average (CHCF, 2005). By relying on the national growth rate projections, our baseline projections implicitly assume that California's slower growth is not maintainable. Medi-Cal expenditure growth in the past has been slowed by the state's limits on managed care capitation rates, physician-reimbursement rates, and similar cost-containment efforts. Over the long run, it is unlikely that containment efforts can be sustained without affecting access to care. Moreover, extensions of coverage to low-cost users could have had a deflationary effect on past growth rates in California. Since our projections assume current law, such expansions will not affect future growth rates. Finally, as Medicaid policy is argued at the national level, it is also important for California to have a forecast that can be linked back to the national forecasts.

If we instead assume that California health care expenditures will continue to grow 10 percent more slowly than the national rates – at 7.65 percent annually rather than 8.5 percent annually – the projected costs for Medi-Cal are lower. Under this alternative assumption, we project that Medi-Cal benefits will total $35.8 billion in 2010 and $51.0 billion in 2015, instead of $37.6 billion and $55.5 as in the baseline. Repeating the calculations for Figure S.2, this alternative implies that Medi-Cal will rise to 17.8 percent of the General Fund by 2010 and 19.0 percent by 2015.

Our review of recent trends in enrollment and costs per enrollee suggests that effective strategies to contain costs will require difficult choices. Both enrollment and costs per enrollee have grown in recent years. More than one-in-five Californians were enrolled in Medi-Cal at some point during 2002-03, a 22 percent increase from the 1999 trough. However, because of the expansion of managed care, fee-for-service enrollment actually fell between 1999 and 2003. Overall, costs per enrollee have grown substantially. Within fee-for-service Medi-Cal, average costs per enrollee grew 61 percent between 1997 and 2003 to $3019 annually, and average monthly costs per enrollee in managed care increased 57 percent.

Policy changes focused on children will have relatively less effect than those centered on older enrollees, since average fee-for-service costs in 2003 differ dramatically by age. On average, children incur around $800 in annual expenses and adults in their 20s and early 30s incur more than double this amount. After age 36 or so, costs rise rapidly with age, except for a sharp decline as adults become eligible for Medicare. Costs increase again for the elderly: The average 85-year-old Medi-Cal enrollee incurs about $10,000 of expenditures. Although cross-sectional comparisons make clear that a sharp increase in average costs occurred between 1997 and 2003, they actually underestimate the trend in costs for cohorts followed over the period. For example, costs for 52-year-olds in 1997 rose from $3,824 to $7,694 as they aged from 52 to 58 by 2003 – a 100 percent increase compared to a 75 percent increase in the cross-section comparison of 52-year-olds in 1997 to 52-year-olds in 2003. This distinction is critical to understanding the growth in costs as a population ages through the Medi-Cal program.

More important for policy, however, is the fact that Medi-Cal spending is extremely concentrated among a small segment of the enrollee population. Even though average costs were over $3000 in 2003, three-quarters of enrollees incurred less than $1800 during the year. More than half of enrollees incurred less than $150 in annual expenses in 2003, and 36 percent had no costs. An enormous share of all expenditures go to a small number of cases: 60 percent of all Medi-Cal expenditures in 2003 went to benefits for only five percent of enrollees. The most expensive two-percent of enrollees were responsible for more than 40 percent of all fee-for-service Medi-Cal benefit expenditures. The bottom 75 percent of enrollees accounted for less than 6 percent of all costs. This means that even if costs were cut in half for all fee-for-service enrollees in the lowest 75 percent of cases, the total savings would be less than 3 percent. Viewed from a policy perspective, the extreme concentration of Medi-Cal expenditures makes it clear that the only way to save significant cost involves addressing expenses for the highest cost cases. This is a tremendous policy challenge, because these cases disproportionately include disabled and elderly enrollees; and the costs are dominated by nursing home and hospital stays.

Preface

      This study was undertaken in response to a request from Secretary Kimberly Belshé, California Health and Human Services Agency (CHHSA). The Secretary sought insights into the projected long-term trends in Medi-Cal expenditures to help inform policymakers' decisions regarding the organization, structure, and financing of this important program. Project staff worked closely with staff of the Department of Health Services to understand the administrative data and programmatic details. Project staff also received input from the Department of Finance, the Legislative Analyst's Office, and legislative staff. The content of the final paper and the timing of its release were determined solely by PPIC. The views expressed in the paper are those of the authors and do not necessarily reflect the views of staff or officers of CHHSA or PPIC.

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Acknowledgments

1. Introduction

Throughout the country, states are facing a growing crisis in Medicaid, the safety net health insurance program for the poor, known in California as Medi-Cal. Nationally, Medicaid spending has more than doubled since 1995, rising from $156 billion in 1995 to $309 billion in 2004.   Throughout the United States, Medicaid and K-12 education now represent about the same share of state expenditures, about 22 percent each of total state budgets.   States do receive federal matching funds for Medicaid, although states spent an estimated $133 billion out of state general-fund coffers for Medicaid in 2004, up 36 percent just since 2000 (NASBO, 2004). They would have paid more in the absence of federal fiscal relief for Medicaid in the 2003-2004 fiscal year, which provided an extra $10 billion in federal funds. The federal fiscal relief expired in June 2004, however, and the federal government is projecting substantial additional growth in Medicaid expenditures, up 35-to-39 percent in the next five years (OMB, 2004; CBO, 2004).

As Medicaid continues to grow faster than state budgets, every state is seeking cost-containment strategies. Tennessee found that Medicaid expenditures accounted for 26 percent of total state appropriations in 2003, and state officials fear costs could rise to 36 percent of state spending by 2008. In response, the governor has proposed a radical restructuring of the state Medicaid program, Tenncare, cutting about a third of participants from its rolls through a more restrictive definition of need, limits on benefits, and loss of services when clients do not meet co-payment requirements (McKinsey & Company, 2003; Finkelstein, 2004). Governor Jeb Bush is proposing privatizing Medicaid services in Florida, where Medicaid expenditures make up about 25 percent of the state's $57 billion annual budget (Hirth, 2005; Lyman, 2005). In New York, citing Medicaid expenditures at 44 percent of the state's $100 billion annual budget, Governor Pataki plans to raise taxes and apply surcharges on hospitals, nursing homes, and other health care providers (Hernandez, 2005). [2] The National Governors' Association is seeking a federal restructuring of Medicaid to alleviate some of the burden on states. At the same time, the Bush Administration is trying to close "accounting gimmicks" that allow states to pass costs to the federal government, as part of a package of federal cuts to Medicaid that is estimated to total $60 billion over ten years (Leavitt, 2005; CBPP, 2005).

Like other states, California is facing a significant challenge in financing the Medi-Cal program. Although the program represents a lower share of total state costs in California than in the rest of the nation, costs are still rising rapidly. From 2000 to 2005, total expenditures on Medi-Cal have risen by a third in real terms, and General Fund expenditures on Medi-Cal have risen 29 percent. Total Medi-Cal costs are approaching $33 billion, with about $12 billion

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[2] It is important to note that press reports on Medicaid as a share of state expenditures do not report comparable numbers. The Tennessee study looked at state Medicaid costs as a share of state General Fund revenues, while the State of Florida reported all Medicaid expenditures as a share of total expenditures, not just General Fund. The costs cited for New York include substantial local expenditures that are not included in state-to-state comparisons such as those developed by the National Association of State Budget Officers (NASBO).   Because Medicaid accounts for a large share of federal funding to states, the program represents a larger proportion of total expenditures than state Medicaid costs represent as a share of General Fund. Based on NASBO (2004) comparisons of Medicaid costs as a share of total state expenditures, Medi-Cal represented 18.5 percent of all California state expenditures in 2003, compared to 21.4 percent nationally, 22.3 percent in Florida, 33.9 percent in Tennessee, and 28.4 percent in New York.

drawn from the General Fund (Figure 1.1). Because Medi-Cal expenditures grew slowly (in real terms) during the economic boom of the late 1990s, the share of the state budget devoted to Medi-Cal fell somewhat during this period. In recent years, total General Fund expenditures have remained relatively stable, while Medi-Cal expenditures rose. For this reason, Medi-Cal expenditures as a share of General Fund expenditures are now at 15 percent. Only K-14 education accounts for a larger share of the General Fund (California HealthCare Foundation, 2004).

California already has a number of cost containment strategies in place for the Medi-Cal program, such as extensive use of managed care and prescription drug rebates. However, California is facing an ongoing fiscal crisis in the state budget overall. If Medi-Cal expenditures continue to climb rapidly, without a parallel increase in state revenues, policymakers will be forced to make one of three choices: reduce Medi-Cal expenditures through cuts or cost savings, redirect spending from other programs to Medi-Cal, or raise revenues (e.g., taxes). Governor Schwarzenegger's 2005-2006 budget proposes additional cost-containment strategies, including expanded use of managed care – especially for aged and disabled enrollees – monthly premiums, privatization of some Medi-Cal eligibility determinations, and better integration of Medi-Cal and Medicare. These proposals were significantly scaled back from the "Medi-Cal Redesign" proposals in the 2004-05 budget that were expected to save $400 million (Benson, 2005). The expected savings from the current budget proposals are more modest, with savings of $287 million in total Medi-Cal expenditures and $145 million in General Fund expenditures.[3]

As the legislature considers these and other Medi-Cal proposals related to the California budget, this paper considers four related research questions. Our main goal is a forecast of future Medi-Cal expenditures. In particular:

- How much are Medi-Cal expenditures likely to increase in the next five to ten years under existing Medi-Cal policies?

- How does the growth in Medi-Cal expenditures compare to projected state revenues?

To place these questions in context, we first review California's recent experiences with Medi-Cal, especially:

- How have the critical Medi-Cal cost drivers of enrollments and costs per enrollees changed over time?

- To the degree that expenditures are driven by higher costs per enrollee, is this increase distributed across all enrollees or concentrated in specific groups?

The answers to these questions are critical both to informing discussions about Medi-Cal policy changes and, where needed, to choosing policy changes that are likely to address the real drivers of Medi-Cal costs.

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[3] Based on estimates from the Medi-Cal Redesign web page in March 2005 accessed at http://www.medi-calredesign.org/pdf/MC_Redesign_Fact_Sheet_11005_Final.pdf .

Figure 1.1
Total and General Fund Medi-Cal Expenditures, 1984-85 to 2004-05
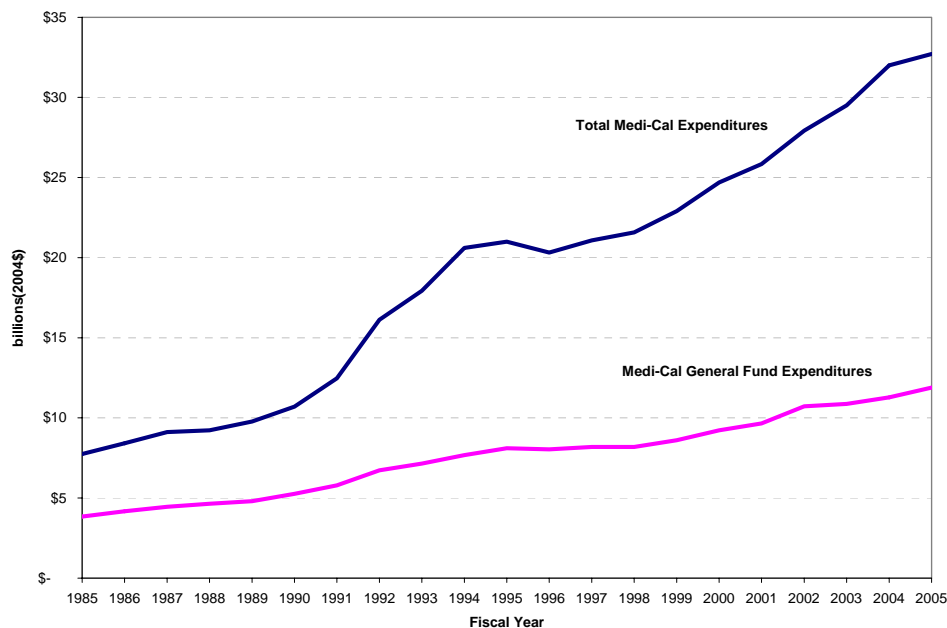
SOURCE: Authors' calculations based on data from California Department of Health Services, Fiscal Forecasting and Data Management Branch from May 2004 Medi-Cal Estimate, and California Department of Finance, adjusted for inflation using CPI-U. Total expenditures include federal funds.

In addressing these questions, we will focus on the two elements of the Medi-Cal budget that represent the core health insurance aspects of the Medi-Cal program: traditional fee-for-service health care coverage and managed care services. Together, these two types of coverage are commonly thought of as the main Medi-Cal program. In fact, the overall Medi-Cal budget is actually an umbrella for a number of related programs. In addition to the fee-for-service (FFS) and managed care expenses, Medi-Cal also provides dental coverage, buy-in of Medicare premiums for Medi-Cal/Medicare dual eligibles, community mental health care services delivered by counties through the Short-Doyle program, and other programs including support for hospitals, personal care services, home and community-based waiver services, voluntary intergovernmental transfers and child preventative and diagnostic screening services.[4]. As Figure 1.2 demonstrates, fee-for-service and managed care coverage represents 89 percent of the state expenditures in the Medi-Cal budget. Since both Short-Doyle services and payments to hospitals are predominantly paid with federal funds, fee-for-service and managed care represent a somewhat smaller share – 80 percent – of the combined federal and state expenditures on Medi-Cal.

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[4] "Buy-in" refers to Medicare premium payments made by the Medi-Cal program for some enrollees who are eligible for both programs. California's Short-Doyle Act was enacted in 1957 to organize and provide financing for local mental health services.

Figure 1.2
State Medi-Cal Expenditures, 2003-04,
by Payment Type
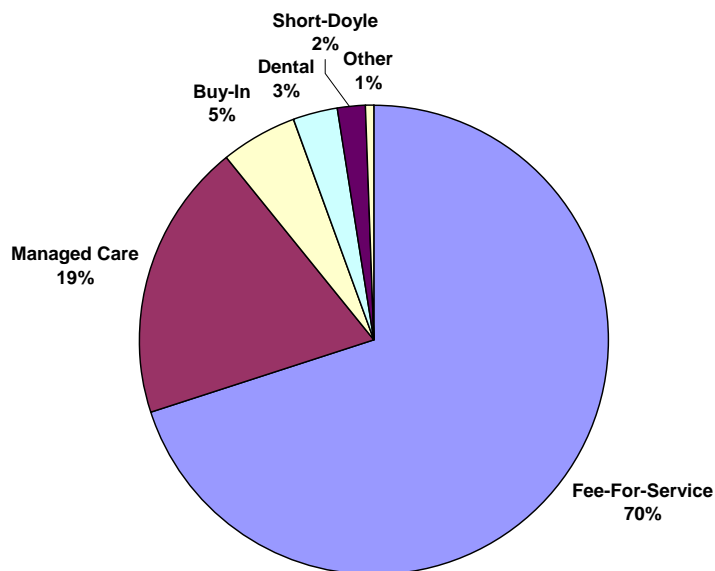
SOURCE: Calculated from "Medi-Cal 2004 Medi-Cal Expenditures by Service Category 2003/4 FY" in California Department of Health Services, Fiscal Forecasting and Data Management Branch, Medi-Cal May 2004 Local Assistance Estimate for Fiscal Years 2003-04 and 2004-05, Sacramento, CA, May 2004. Excludes recoveries including from audits and lawsuits.

Both our analysis and our projections are based on fee-for-service and managed care expenditures, rather than the entire Medi-Cal budget. However, as described in Chapter 5, we revisit the issue of the other costs within the Medi-Cal budget by adjusting our projections by a constant factor to account for the other Medi-Cal expenditures. The projections assume no change in current policies and therefore do not include proposals related to Medi-Cal redesign nor effects of the new Medicare drug benefits. Finally, our projections are based on expenditures as they are accrued rather than on the cash basis that is currently used for budget purposes. For this reason, the projections would not be expected to match the shorter run projections developed by the Department of Health Services. Our projections and approach are best suited for long-term analysis, and therefore we do not report our near-year projections.

The paper is organized around the dual themes of enrollment and cost per enrollee. Chapter 2 reviews recent trends in Medi-Cal enrollment. Chapter 3 presents findings on costs per enrollee, examining both the average costs and the distribution of costs. Chapter 4 projects future expenditures on Medi-Cal benefits, based on a forecasting model built from assumptions on future enrollment growth and growth in expenditures per enrollee. Chapter 5 concludes by comparing the implied projection of state Medi-Cal expenditures to projections for state General Fund revenues.

2. Medi-Cal Enrollment 1997-2003

Reduced to the most basic level, total expenditures in the Medi-Cal program are determined by the level of enrollment and the costs per enrollee. In this chapter, we examine the trends in enrollment from 1997 to 2003, both overall and in managed care versus fee-for-service. The findings on enrollment are based on person-month eligibility and enrollment data from the Medi-Cal Eligibility Data System (MEDS), along with population data from the Department of Finance. As described in Appendix A, we have MEDS data covering the period July 1996 through June 2003, that is, fiscal years 1997 through 2003.

In considering enrollment (and costs in the following chapter), we will pay particular attention to the way these trends differ for different age groups (cohorts). [5] The focus on age has three benefits: First, age is a fairly good proxy for eligibility basis. Second, by following cohorts as they age, we can better understand the growth in costs as distinct from the change in the caseload composition. Third, the aging of the California population is one of the elements that will drive the projections for future Medi-Cal expenditures, as we describe in Chapter 4.

Overall Enrollment Trends

In an average month in 1999, about 5 million Californians were enrolled in the Medi-Cal program (Figure 2.1). Caseloads in Medi-Cal had fallen in association with welfare reform and the economic recovery. At that time, Medi-Cal covered about 15 percent of Californians.

Figure 2.1
Medi-Cal Enrollments 1997-2003

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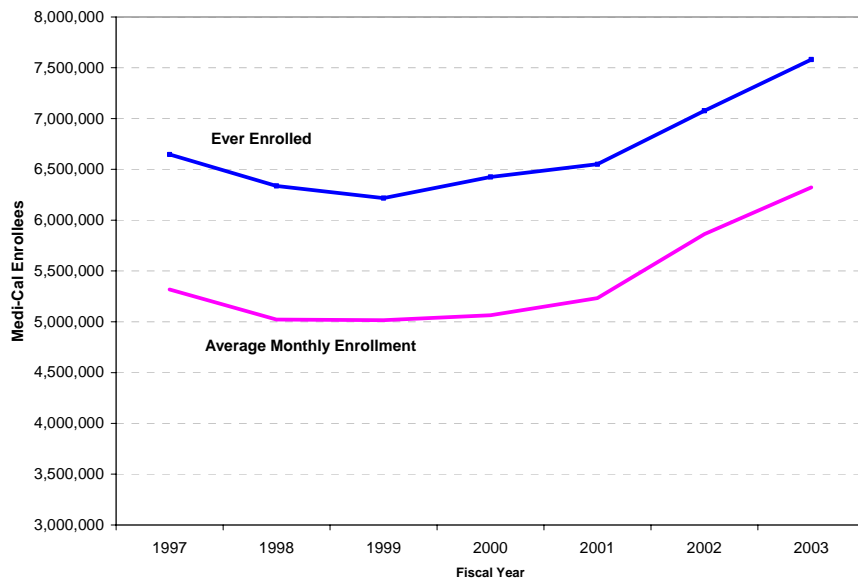
[5] A cohort is usually thought of as a group of people with a common experience at one point in time, for example, people born in 1950 or graduated high school in 1990, who are then followed over time. The Baby Boom is the best known cohort, and we have watched the effects of this cohort moving through schools, into the workforce and soon into retirement.

Because clients gained or lost eligibility during the year, the number ever receiving Medi-Cal was somewhat higher: More than 6.2 million Californians, or 19 percent, were enrolled for at least one month during the year (Figure 2.2).

Figure 2.2
Medi-Cal Enrollments as Share of California Population, 1997-2003
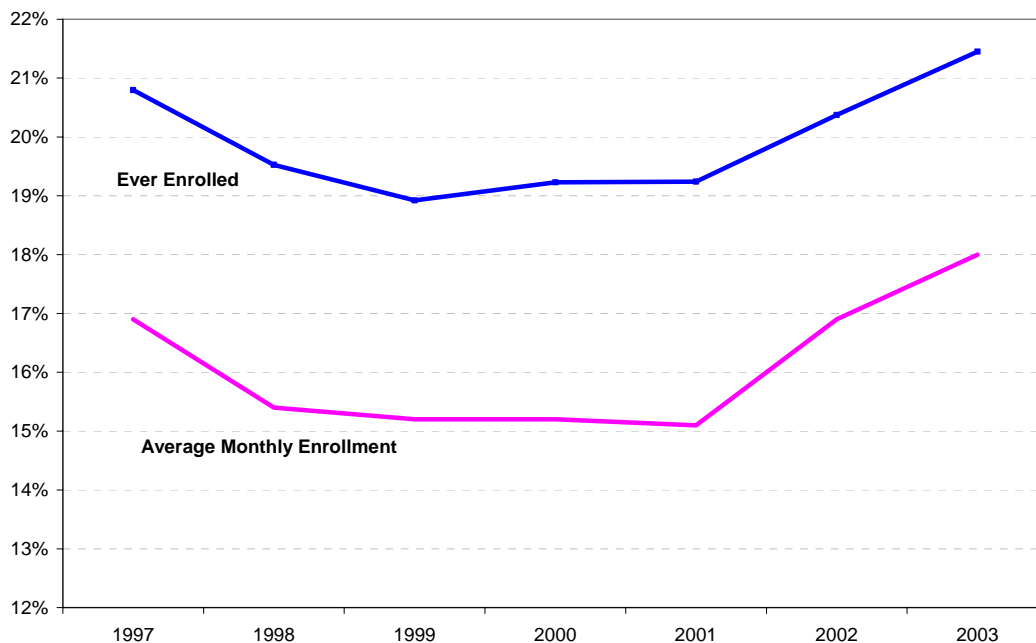
1999 turned out to be the bottom of the trough in Medi-Cal caseloads. By 2000, the caseload began to increase again. Enrollment as a share of the population rose sharply in 2001 and 2002. This increase resulted partly from policies designed to ensure Medi-Cal participation of families who should have remained eligible after leaving welfare, as well as expansions in eligibility. A number of policy changes simplified the eligibility process, allowing longer continuous eligibility, reducing documentation requirements, streamlining application procedures, and reducing reporting requirements.   Coverage was also expanded for working families, working individuals with disabilities and aged, blind, and disabled beneficiaries with income above the poverty threshold (CHCF, 2004).

By June 2003, average monthly caseloads rose to 6.4 million or 18 percent of the population. More than one in five Californians were enrolled in Medi-Cal at some time during the 2003 fiscal year. Although this represents 1 million more enrollees in 2003 than in 1999, it represents only an additional 2 percent of the population than in 1999 and only a slightly greater share of the population than in 1997.

In 2003, most of the Medi-Cal enrollees (64 percent) were eligible as medically needy or public assistance families (Figure 2.3).[6] The next largest group was children who were eligible

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[6] Medically needy is an eligibility category that covers enrollees whose income is too high for cash assistance due to income limits but who would otherwise meet the criteria for cash aid. Depending on their income level, these enrollees may be required to pay a share of Medi-Cal costs.

either as medically indigent children or because their families' income was low enough for the children to be eligible but not their parents, as described below. Blind and disabled persons represented 12 percent of the caseload, while those who qualified based on aged status represented 7 percent. Much smaller shares were eligible based on a variety of other aid categories.[7]

Figure 2.3
Medi-Cal Enrollees by Major Aid Categories, 2003
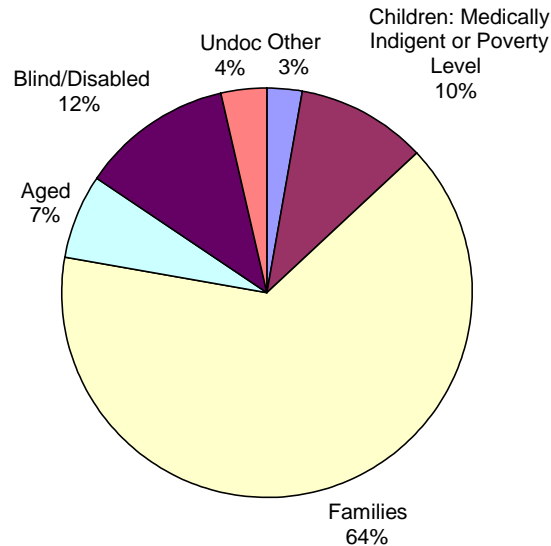
Enrollment by Age

About one in five Californians (21 percent) were enrolled in Medi-Cal for at least one month in 2003. The enrollment rate varies dramatically by age. Figure 2.4 reports the share of the California population that is enrolled by age. The patterns of enrollment by age are closely related to the basis for eligibility.

The highest rates of enrollment are for the youngest children: About half of all children under the age of three in 2003 were enrolled for at least one month. Through age 18, children of all ages are more likely than any adult age group to be enrolled in Medi-Cal, with an enrollment rate that falls from 50 percent for the youngest children to 29 percent for 18-year-olds. Most children on Medi-Cal qualify because they are from low-income families or families who receive or used to receive welfare. Pregnant women and infants under the age of one can qualify for Medi-Cal with family income up to 200 percent of the federal poverty level (FPL). The income threshold falls as children get older. In addition to qualifying through public assistance, children under the age of six whose family income is below 133 percent of FPL are also eligible. For children aged six to 19, the family income threshold falls to 100 percent of FPL.

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[7] Enrollees were categorized by predominant aid code in the fiscal year.

Enrollment rates for non-elderly adults also fall with age, from 19 percent among 22-year-olds to 11 percent among 64-year-olds. Many of these non-elderly adults are the parents in low-income families or pregnant women. Non-elderly adults may also qualify for Medi-Cal because they have a disability, usually with categorical eligibility through the Supplemental Security Income (SSI) program. A few non-disabling conditions or specific treatments are also covered by Medi-Cal.[8] Finally, elderly enrollees are eligible through the SSI program or otherwise deemed low-income and unable to work.

Figure 2.4
Medi-Cal Enrollment as Share of California Population
by Age, 2003
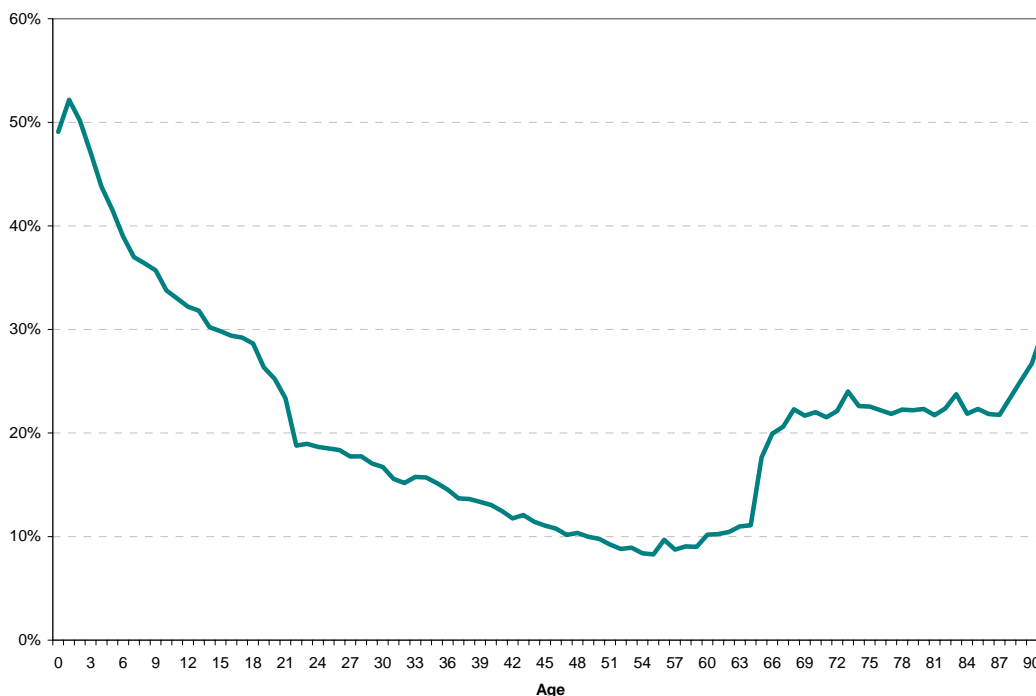
As we see in Figure 2.4, enrollment rates jump at age 65 when adults become eligible based on aged status. Approximately 22 percent of Californians aged 67-to-87 were enrolled in Medi-Cal for at least one month during 2002-03. Medi-Cal enrollment rises among the very elderly, especially those over 90, when many low-income elderly come onto the Medi-Cal rolls to pay for long-term care.

Figure 2.5 compares Medi-Cal enrollment by age in 1999, when enrollment was at its lowest since the early 1990s, to that in 2003. The enrollment growth is spread across most age ranges. The greatest enrollment growth was among young adults. Enrollment among all adults rose by almost 780,000, a 35 percent increase. An additional 450,000 children were enrolled at some point in 2002-03 compared to 1998-99, a 14 percent increase in enrollment. Only the very elderly had lower enrollment rates in 2003 than in 1999. This decline in enrollment rates is due

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[8] For example, kidney dialysis, tuberculosis, breast and cervical cancer, and limited family planning services. See Boyle, Pande, and Lynch (2004) for a description of Medi-Cal eligibility classifications.

to an increase in the estimated base populations of the very elderly rather than a decline in the number of elderly enrollees.[9]

Figure 2.5
Medi-Cal Enrollment as Share of California Population
by Age, 1999 and 2003
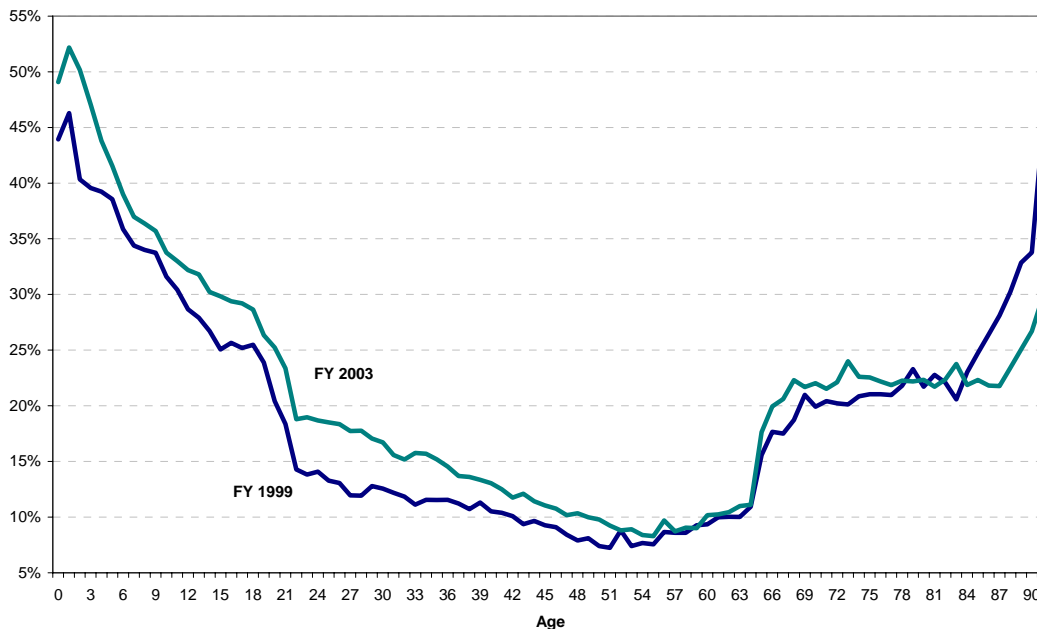
As noted earlier, these enrollment increases were due to policies that significantly expanded coverage in 2000 and 2001. Many of these policy changes simplified the enrollment process and reduced the frequency of recertification required to maintain eligibility. For example, in-person application requirements were dropped, as were asset tests for child eligibility, and there were reductions in the documentation required. Once eligible, children became continuously eligible for 12-month periods, and reporting requirements for adults were reduced from quarterly reporting to semi-annual reporting. Additionally, there were direct expansions in coverage to poor two-parent working families as well as aged, blind, and disabled beneficiaries with income above the poverty thresholds (CHCF, 2004).

Table 2.1 summarizes the age breakdown for Medi-Cal enrollees in 2003. Children represented 49 percent of all individuals enrolled for at least one month during the year. People aged 65 or older represented 10 percent.

The different patterns of enrollment by age are linked to different eligibility categories. Figure 2.6 divides enrollees into three broad eligibility categories: blind/disabled, aged, and

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[9] The California Department of Finance estimates that the population 85 and over increased by one-third between 1999 and 2003.

Table 2.1
Share of Medi-Cal Enrollees by Age Category, 2003

Under 6	21%
6 to 17	28%
18 to under 21	6%
21 to 64	36%
65 and older	10%

May not total 100% due to rounding.

families and other. As we see in the figure, the vast majority of enrollees up through middle age are in family (or other) eligibility categories. In fact, fewer than 5 percent of child enrollees of any age qualify through disability status. Disability as a main basis for eligibility does not surpass family and other eligibility codes except among adults older than 52. At age 66, when adults have become eligible on the basis of age, 45 percent of enrollees are eligible on the basis of aged status, 38 percent based on disability, and 17 percent as members of families or based on special health care needs.

Figure 2.6
Medi-Cal Enrollment as Share of California Population
by Age and Major Eligibility Group, 2003
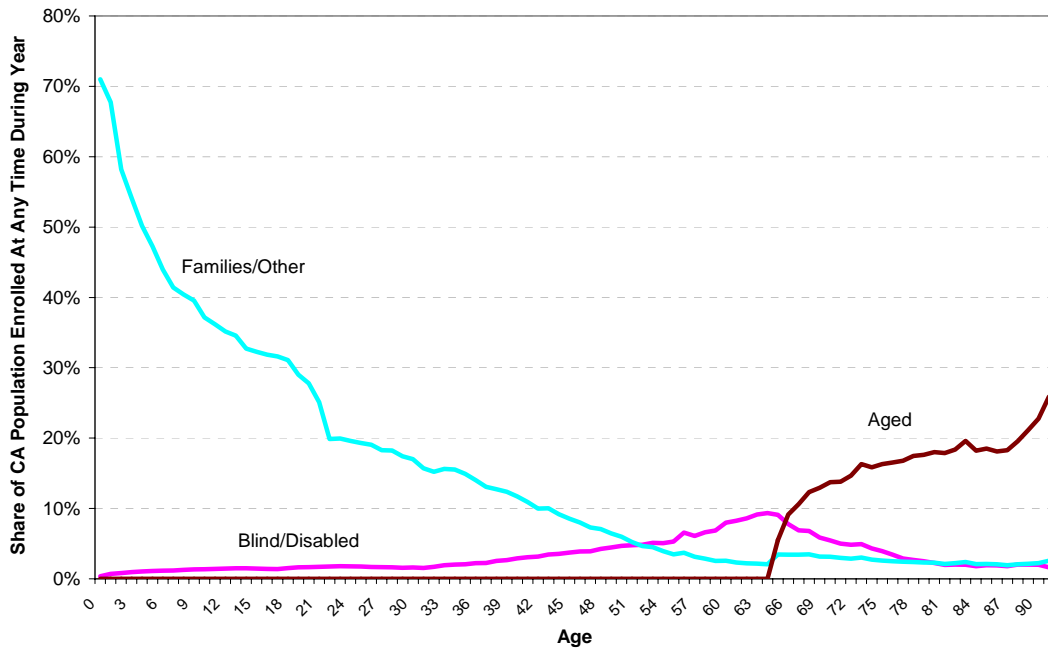
Enrollment in Fee-for-Service and Managed Care

Patients covered by Medi-Cal receive health care services through one of two basic finance mechanisms. The majority of enrollees participate in traditional fee-for-service Medi-Cal, where a provider is reimbursed by Medi-Cal based on claims filed for services provided, such as a physician visit, prescription, or stay in the hospital. (Fee-for-service coverage is also

used for emergency services such as those for undocumented immigrants.) However, 20 out of California's 58 counties offer managed care options for Medi-Cal. Families whose eligibility is based on public assistance are required to enroll in managed care, along with families not required to pay a share of costs, medically needy individuals, and medically indigent children. Managed care enrollment is also mandatory for most participants in counties that run their own managed care systems (the County Operated Health Systems). The 20 counties with managed care options are the urbanized counties; counties who do not offer managed care are largely rural counties. Hence most Medi-Cal enrollees (85 percent) live in a county that offers managed care (Hunt, Peters, and Saari, 1999; McCall et al., 2000).

In 2003, an average 52 percent of Medi-Cal enrollees were covered by fee-for-service Medi-Cal, and 48 percent were enrolled in managed care plans (individuals may have shifted between fee-for-service and managed care during the year). Enrollees who are eligible based on family eligibility rules make up more than 80 percent of the managed care rolls, compared to 49 percent of the fee-for-service caseload, with this split determined largely by county of residence. Aged and blind/disabled enrollees are usually on fee-for-service Medi-Cal rather than managed care (Table 2.2); these groups represent 29 percent of the fee-for-service caseload and only 7 percent of the managed care caseload.

Table 2.2
Share of Medi-Cal Enrollees by Predominant Aid Code,
Fee-for-Service and Managed Care, 2003

Aid Code	FFS	Managed Care
Medically Indigent Children	2%	2%
Public Assistance Families	14%	35%
Medically Needy Families	35%	47%
Aged	11%	2%
Blind/Disabled	18%	5%
Undocumented Persons	7%	0%
Other	13%	8%

May not total 100% due to rounding.

The same managed care requirements (mandatory for families in counties where it is available) largely determine the age breakdown of enrollees in each program (Table 2.3). Managed care is the main mode of coverage for children, as shown in Figure 2.7.[10] Adults, however, are more likely to be covered through fee-for-service Medi-Cal. Aged adults, in particular, are six times more likely to be covered through fee-for-service than managed care. As a result, the age-profile of enrollees is very different between the two groups, with children representing 62 percent of managed care enrollees, compared to 37 percent of fee-for-service enrollees. Individuals over 65 represent only 3 percent of managed care enrollees, but 16 percent of fee-for-service.

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[10] Individuals who are in both fee-for-service and managed care during the year are counted in both groups.

Table 2.3
Share of Medi-Cal Enrollees by Age Category,
Fee-for-Service and Managed Care, 2003

Age	FFS	Managed Care
Under 6	16%	26%
6 to 17	21%	36%
18 to under 21	5%	6%
21 to 64	41%	29%
65 and older	16%	3%

May not total 100% due to rounding.

Figure 2.7
Fee-for-Service and Managed Care Medi-Cal Enrollment
as Share of California Population by Age, 2003
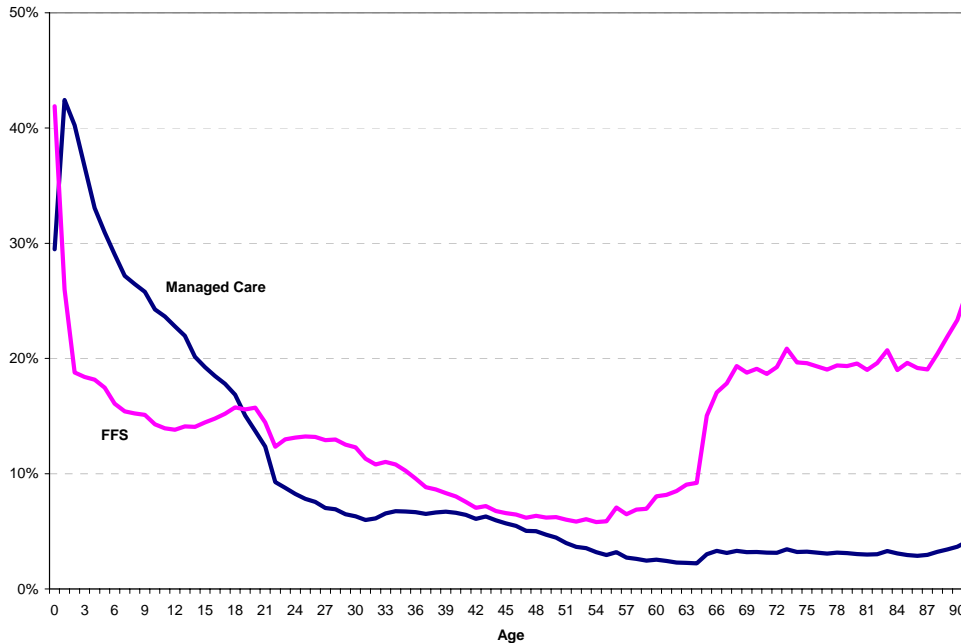
These enrollment patterns reflect the growing importance of managed care in the late 1990s. Despite the growth in enrollment across most ages, fee-for-service enrollment actually fell between 1997 and 2003, while managed care enrollment grew (Figures 2.8 and 2.9). This shift is almost entirely centered in family and child eligibility categories. Fee-for-service enrollment as a share of the California population fell between 1997 and 2003 for children of all

Figure 2.8
Medi-Cal Fee-for-Service Enrollment as Share of California Population
by Age, 1997 and 2003
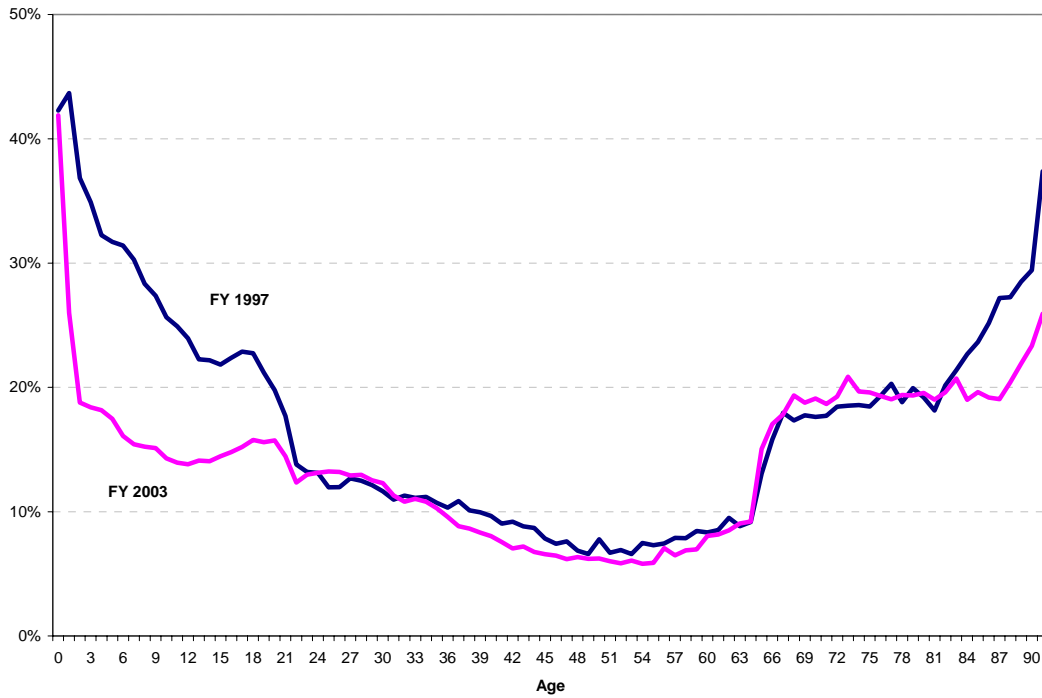
Figure 2.9
Medi-Cal Managed Care Enrollment as Share of California Population
by Age, 1997 and 2003
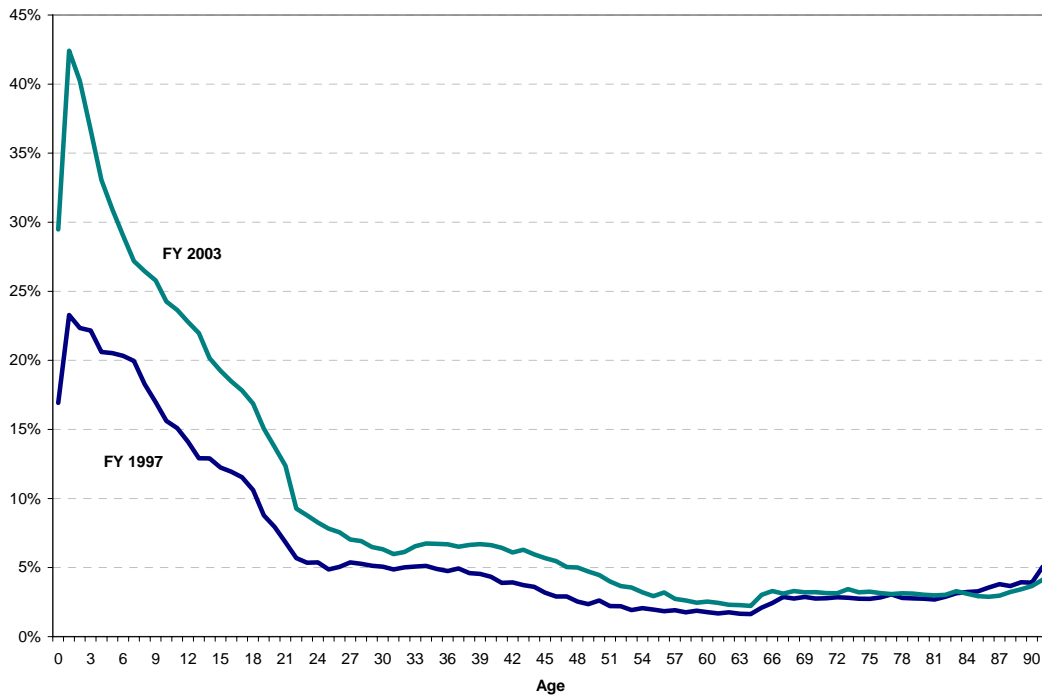
ages with family or child eligibility status. For example, 30 percent of all 7-year-olds in California were on fee-for-service Medi-Cal in 1997. By 2003, only 15 percent of 7-year-olds were on fee-for-service Medi-Cal. Fee-for-service enrollment remained stable for adults in family/other eligibility categories, although managed care enrollments rose. There was also a modest shift in enrollment from fee-for-service to managed care among blind/disabled eligibility groups, especially for adults. There were 10,000 fewer blind/disabled enrollees aged 21 to 55 in fee-for-service Medi-Cal in 2003 compared to 1997, but 25,000 more in managed care.

Summary: Enrollment 1997-2003

At any given time in 2003, approximately 18 percent of the California population was enrolled in Medi-Cal. More than 7.5 million Californians, or 21 percent of the population, participated for at least one month during the year. Although this represents 1 million more enrollees in 2003 than during the post-welfare reform, economic recovery trough in 1999, it is just 2 percent greater than the share in 1999, and only a slightly greater share of the population than in 1997.

Children are the largest group of Medi-Cal enrollees. Almost half of all infants are covered by Medi-Cal at some point during a given year, and more than 30 percent of all children. Between 1997 and 2003, Medi-Cal enrollment grew at all age levels, with the greatest percentage growth among adults.

Across all groups, 52 percent of Medi-Cal enrollees were enrolled in fee-for-service coverage and 48 percent in managed care. Due to increasing reliance on managed care, fee-for-service enrollment actually dropped over the six years we observed, while managed care enrollments grew. Children and families are most likely to participate in managed care. Blind, disabled, and aged eligibles make up only 7 percent of the managed care population compared to 29 percent of fee-for-service recipients.

3. Costs Per Enrollee

The second basic factor in determining Medi-Cal expenditures is the cost per enrollee, the focus of this chapter. The distinctions between fee-for-service and managed care we saw in the previous chapter are critical both because costs are very different between the two categories and because we have much more information about costs under fee-for-service than for managed care. Although we explore overall trends in average costs per enrollee in both managed care and fee-for-service Medi-Cal, we examine costs in fee-for-service Medi-Cal more closely.

Managed care costs are determined primarily by capitation rates established by the state in negotiation with managed care providers. In most cases, encounter or claims data are unavailable on managed care participants. Fee-for-service costs, in contrast, are driven by the services used by Medi-Cal enrollees and reimbursed through claims by Medi-Cal providers. That is why we have much more detailed information on these expenditures, based on Medi-Cal claims data. (A description of these data is included in Appendix A.) By drawing on the claims data, we are able to consider not only the average cost per enrollee but also the distribution of costs across enrollees, which, as we describe below, may provide vital road signs for policymakers seeking to contain the costs of Medi-Cal.

Average Costs per Enrollee

As shown in Figure 3.1, the average cost per enrollee-month – calculated as the total costs for the program divided by all enrollee months in a year – are much higher for fee-for-service than for managed care (Figure 3.1). [11] There are three main reasons for these cost differences: First, children and families are most likely to be enrolled in managed care, whereas the disabled or elderly are most likely to be in fee-for-service Medi-Cal. Not only are children less likely to incur health costs, but Medi-Cal participation of children and families might partly reflect an insurance function (providing coverage if and when it is needed), whereas the disabled and elderly are most likely to enroll because they have ongoing health care costs. Second, managed care enrollment has grown especially among children and working parents, increasing the enrollment base (the denominator for the cost calculation) by adding a population we would expect to be relatively less likely to have health issues (working families, for example). Finally, managed care capitation rates have been negotiated to have little increase in costs in recent years. In fact, as we see in Figure 3.1, average costs for managed care fell in real terms between 2001 and 2002.

Despite the dramatic difference in average cost per enrollee, the rates of increase in costs for fee-for-service and managed care are similar. Between 1997 and 2003, managed care costs

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[11] The enrollee-month calculation counts 12 months for all enrollees who participated all year, but only the actively participating months for those who were not on Medi-Cal all 12 months. For enrollees who switched from one coverage to another during the year, the enrollee-month calculation reflects months on managed care or months on fee-for-service specifically. It is roughly the same as average monthly costs divided by average monthly enrollment. The managed care calculation includes all forms of managed care, including two-plan systems, county operated health systems, geographic managed care, and prepaid health plans.

Figure 3.1
Average Expenditures per Enrollee-Month,
Medi-Cal Managed Care and Fee-for-Service, 1997 to 2003
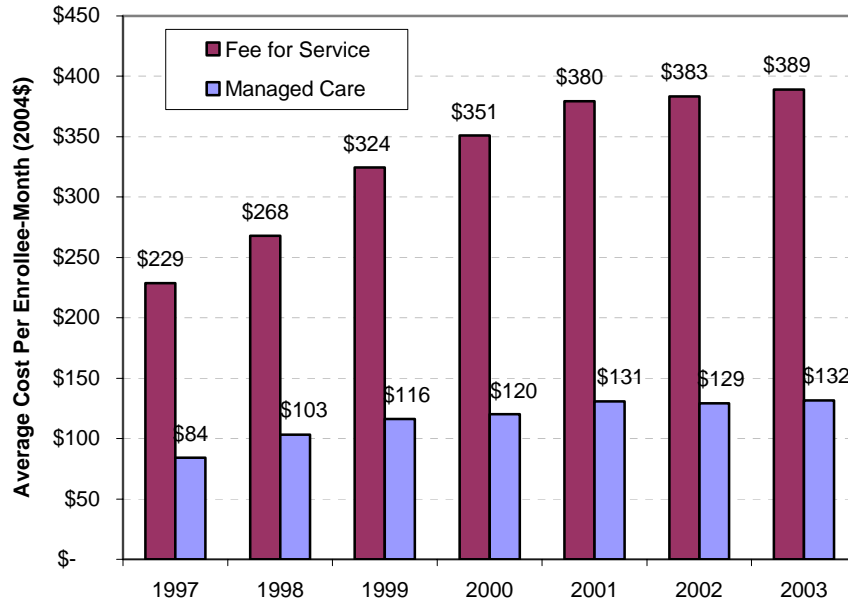
per enrollee rose an average of 7.7 percent per year while fee-for-service costs increased 9.3 percent per year. Although growth over the entire period was faster in fee-for-service, the rate of growth in costs per enrollee was greater in managed care than in fee-for-service in three out of six years.

Unfortunately, we have little information about the cost drivers within managed care. However, using the fee-for-service claims data, we can develop a much richer picture of the expenditures incurred for fee-for-service clients over time. In Figure 3.2, we move from average cost per enrollee-month to average cost per enrollee. Over the entire fiscal year 2002-03, the average expense per enrollee was $3,019. This is less than 12 times the cost per enrollee-month ($389 times 12 = $4,668) because many enrollees are not enrolled for an entire year. Some of this is due to new entrants over the course of the year; some is due to individuals exiting the rolls. At 61 percent, the percentage increase in costs per enrollee over the entire 1997-2003 period was somewhat lower than the increase in costs per enrollee-month, consistent with a declining average number of months of participation each year.

Figure 3.2
Average Annual Fee-for-Service Expenditures per Enrollee, 1997 to 2003
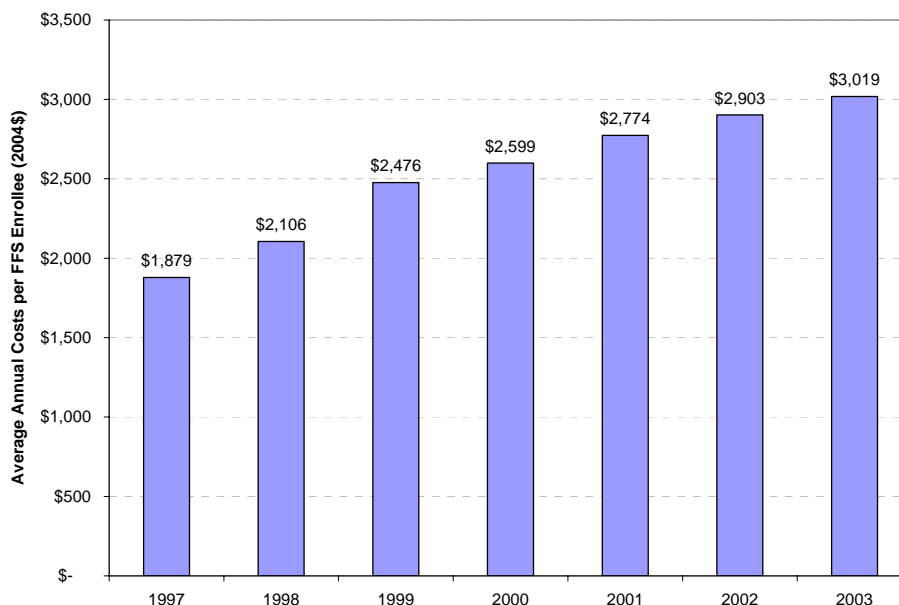
Annual Costs per Enrollee by Age

Figure 3.3 breaks down annual costs per enrollee by age. We take several points from this figure. First, Medi-Cal costs differ dramatically by age. Coverage of children typically costs about $800-$900 annually, even without the price controls in managed care. Costs for adults in their 20s and early 30s hover around $2,000 annually, with relatively little increase with age in this group. After about age 36, costs begin to increase quickly with age. By the mid-40s, average annual costs exceed $5,000; and by the late-50s, average annual costs hit $8,000. There is a sharp decline in costs as individuals become eligible for Medicare at age 65, and then costs increase again, with the sharpest increases with age in the over-65 group. By age 85, average Medi-Cal costs hit about $10,000. These high expenditures for the oldest age groups are driven by long-term care.

The second obvious feature in Figure 3.3 is the rise in costs between 1997 and 2003. As we saw earlier, there was a significant shift of enrollees, especially children, from fee-for-service to managed care. Among children who remained in fee-for-service Medi-Cal, the average cost of care for each child rose only moderately in real terms between 1997 and 2003, as shown in Figure 3.3. For example, costs for children aged 4 rose from $424 annually to $629. The percentage increase is still high (because of the small base) at 48 percent, but lower than the average. Costs for adults over 36 increased more in both absolute and percentage terms.

In fact, the cross-sectional comparison of costs in 2003 to costs in 1997 – that is, comparing individuals at age X in 1997 to individuals age X in 2003 – actually understates the real evolution of costs over time, which is critical to being able to forecast future costs. When we consider the future costs of Medi-Cal, we need to understand the interaction of the aging

population and the growing costs. One way of understanding these trends from a historical perspective is to build "synthetic cohorts." Such a cohort would be people who were 52 years old and on Medi-Cal in 1997, people who were 53 and on Medi-Cal in 1998, and so on, until we arrive at people who were 58 and on Medi-Cal in 2003. These synthetic cohorts differ from actual cohorts because they are not necessarily the exact same people over time, although some people who participated at age 52 will still be participating at age 58.

Figure 3.3
Average Annual Fee-for-Service Expenditures per Enrollee,
by Age, 1997 and 2003 (2004$)
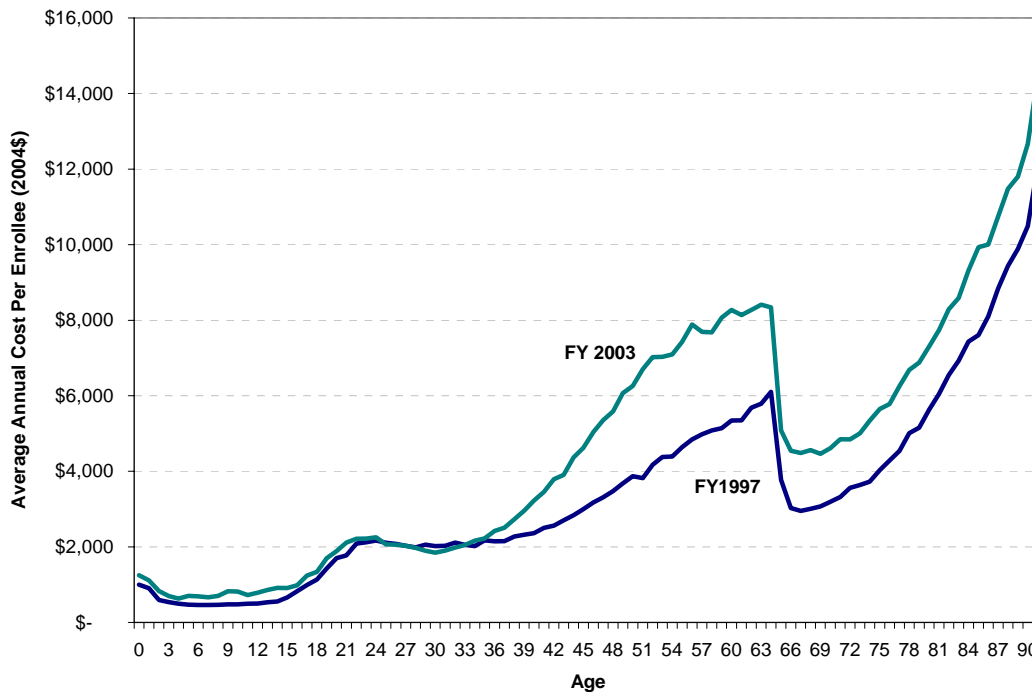
Figure 3.4 zooms in on ages one through 65 as shown on Figure 3.3. Once again, the top line shows costs by age in 2003, the lower line shows costs by age in 1997. However, Figure 3.4 adds the synthetic cohort of people who were 52-year-olds in 1997. Each point on this line shows the average costs for this group as they age over time. By age 58, their costs rose from $3,824 in 1997 to $7,694 in 2003. The trend over time is therefore this 100 percent increase in costs, rather than the 75 percent increase just comparing 52-year-olds in 1997 to 52-year-olds in 2003. Similar cohort trends can be calculated for other age groups.

The age profiles in the preceding figures partly reflect change in medical needs with age, but they also reflect the different mix of enrollees by eligibility group. For children and families, Medi-Cal enrollment can serve an insurance function, providing coverage if and when it is needed. For some children and families, for example those receiving public assistance, Medi-Cal enrollment is automatic. For aged, blind, and disabled enrollees, however, Medi-Cal enrollment is more closely tied to the immediate need for health care and related services.

Figure 3.4
Average Annual Fee-for-Service Expenditures per Enrollee
Example Cohort Trend from 1997 and 2003, (2004$)
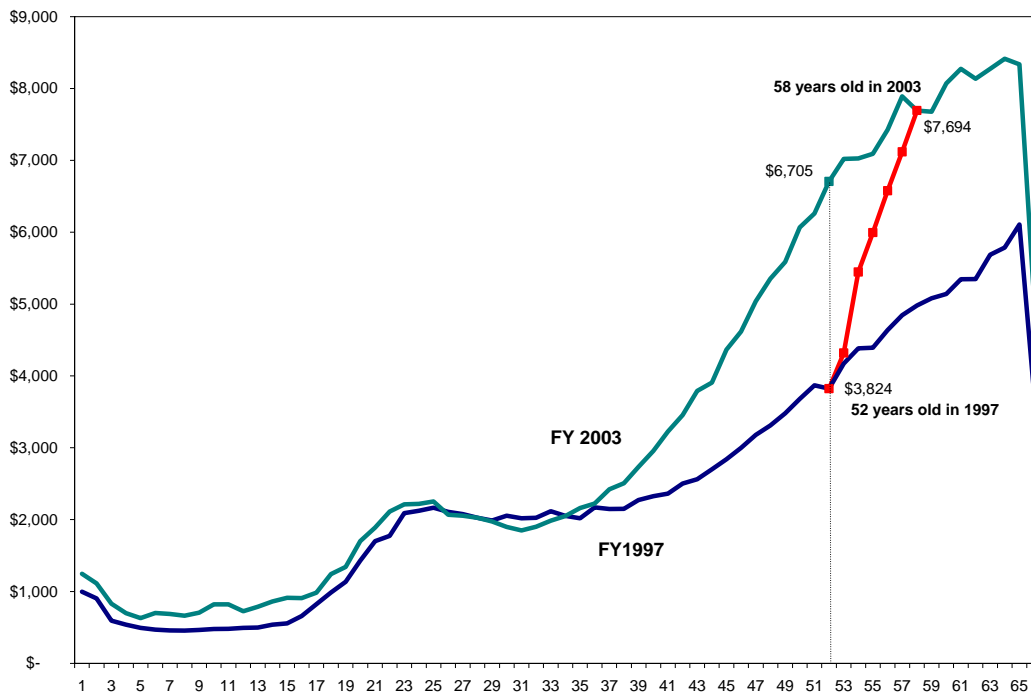
Figures 3.5 and 3.6 show the average annual fee-for-service costs per enrollee in blind and disabled eligibility categories and in aged eligibility categories respectively. (Note that the scale of the vertical axis is different in Figures 3.3, 3.5, and 3.6.) Not surprisingly, significant costs are incurred immediately after birth for blind and disabled infants. Afterwards, costs for blind/disabled enrollees are fairly steady by age, ranging from around $6,000 to $9,000.[12] Costs have increased substantially for all ages of blind/disabled enrollee, an average of 46 percent. This compares to a 24 percent increase on average for enrollees in family and other categories, although this increase is driven primarily by the "other" category, especially older adults using special medical services, rather than by families and children.

For aged enrollees, average fee-for-service expenditures increase steadily by age (Figure 3.6). Among 66-year-olds, for example, average costs grew from $2,200 in 1997 to $3,700 in 2003. Among 86-year-olds, average costs grew from $8,500 to $10,900. Averaged across all age groups, average costs for aged enrollees rose 38 percent.

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[12] This calculation includes only costs paid through the Department of Health Services. Substantial additional costs for disabled clients in particular are paid through other departments, including the Departments of Mental Health and Developmental Services and the Department of Social Services.

Figure 3.5
Average Annual Fee-for-Service Expenditures per Enrollee
Blind and Disabled Eligibility Groups, 1997 and 2003 (2004$)
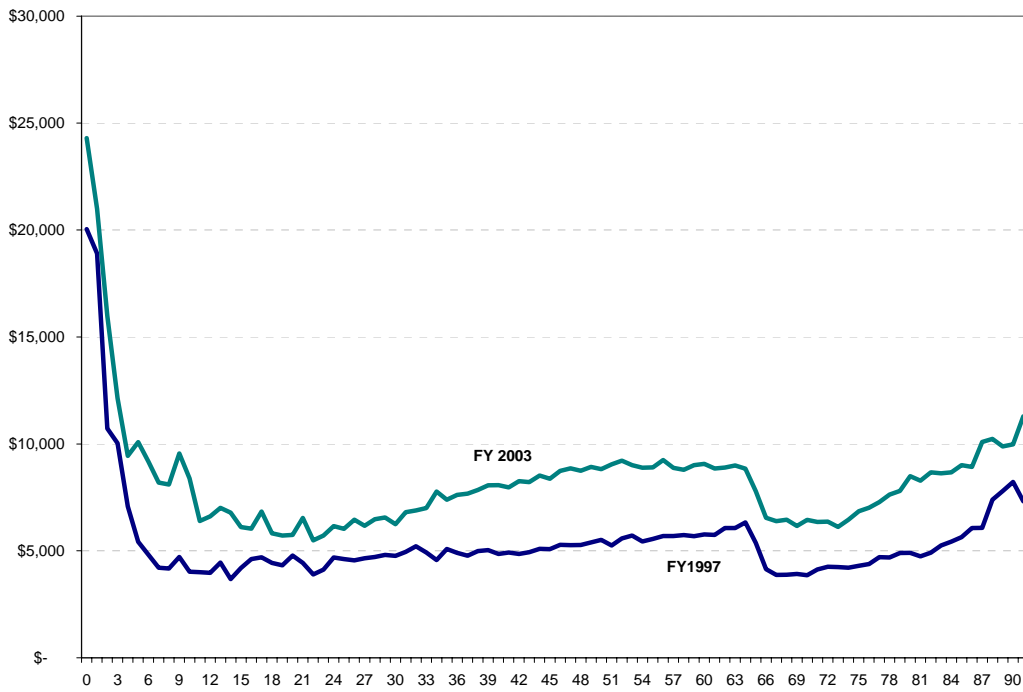
Figure 3.6
Average Annual Fee-for-Service Expenditures per Enrollee
Aged Eligibility Groups, 1997 and 2003 (2004$)
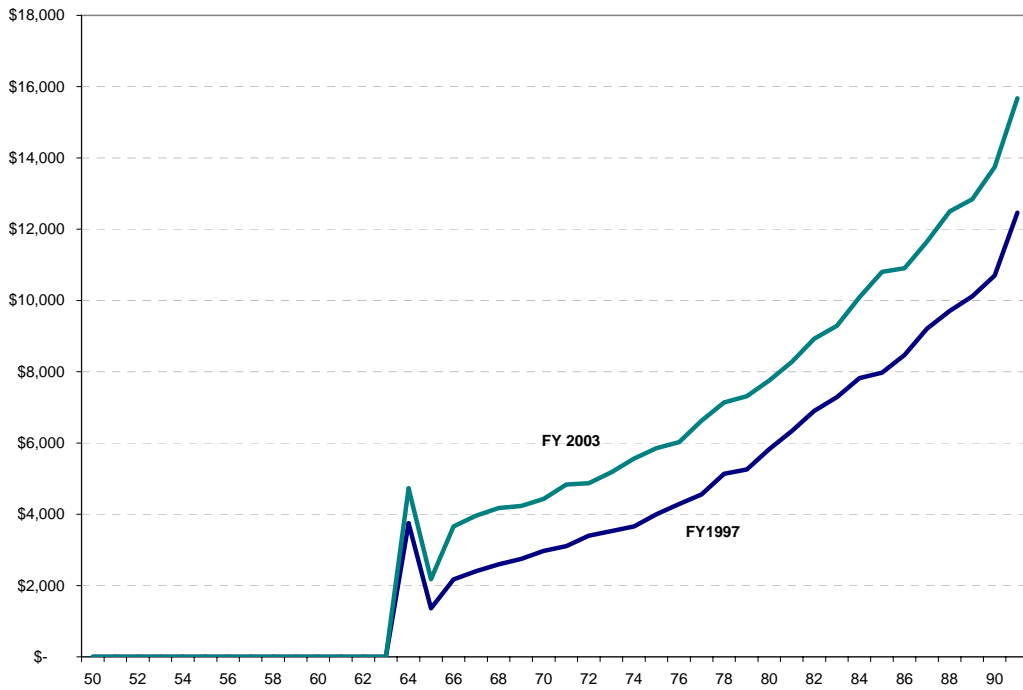
Distribution of Costs

The figures presented above examine the growth in average costs per enrollee. To better understand the drivers of these cost increases, as well as the potential policy responses, we turn now to examining the distribution of costs within these groups. We start with a discussion of the share of enrollees with zero versus positive costs in a given year. The presence of a large share of zero-cost enrollees underscores the importance of the distributional differences. We therefore follow with an analysis of costs at different percentile points in the distribution.

Share of Enrollees Incurring Costs

One feature of recent fee-for-service Medi-Cal is a declining share of what we might call "participants." Managed care capitation rates are paid to providers whether or not any health services are used and are designed not to change based on the actual costs incurred. From the perspective of state expenditures, there is no difference between a managed care enrollee and a managed care participant. In fee-for-service, in contrast, expenses are tied to the health services provided. Patients who do not use health services do not incur costs. In recent years, the share of Medi-Cal clients with zero costs has been rising. That is, the share of enrollees who participate in health services – who incur any positive costs during a year – has been falling (Figure 3.7). In 1997, 73 percent of all enrollees incurred costs during the year; in 2003, only 64 percent incurred costs. Since 2000, this decline can be attributed to increases in the number of enrollees rather than declines in the number of enrollees using services. Between 2000 and 2003, the number of enrollees with costs increased 7 percent while the number of enrollees with no costs increased 24 percent. The sharpest declines in participation occurred between 1997 and 2000. During that time period, the number of enrollees declined by 10 percent whereas the number of enrollees with costs declined by 33 percent.

Not surprisingly, children are least likely to incur costs during the year. More striking is the fact that the biggest drop in participation has been among adults aged 27 to 37, as we see in Figure 3.8. In 1997, 72 percent of 33 year old enrollees incurred some costs. In 2003, less than half of enrollees in this age group incurred costs (the same pattern holds if you compare 33-year-olds in 1997 to 39-year-olds six years later). The sharpest drops occurred between 1999 and 2000 and between 2000 and 2001, although participation continued to decline in each subsequent year. This effect is primarily concentrated in family eligibility categories (consistent with the similar though less extreme participation drops for children).

We would usually assume that families entering the workplace would be the most healthy families, so that families who did not leave the rolls would be more likely rather than less likely to participate. We do know that fee-for-service enrollment for families shifted from public assistance to medically needy, which has historically had lower adult participation than

Figure 3.7
Share of Fee-for-Service Enrollees Incurring Any Costs, 1997-2003
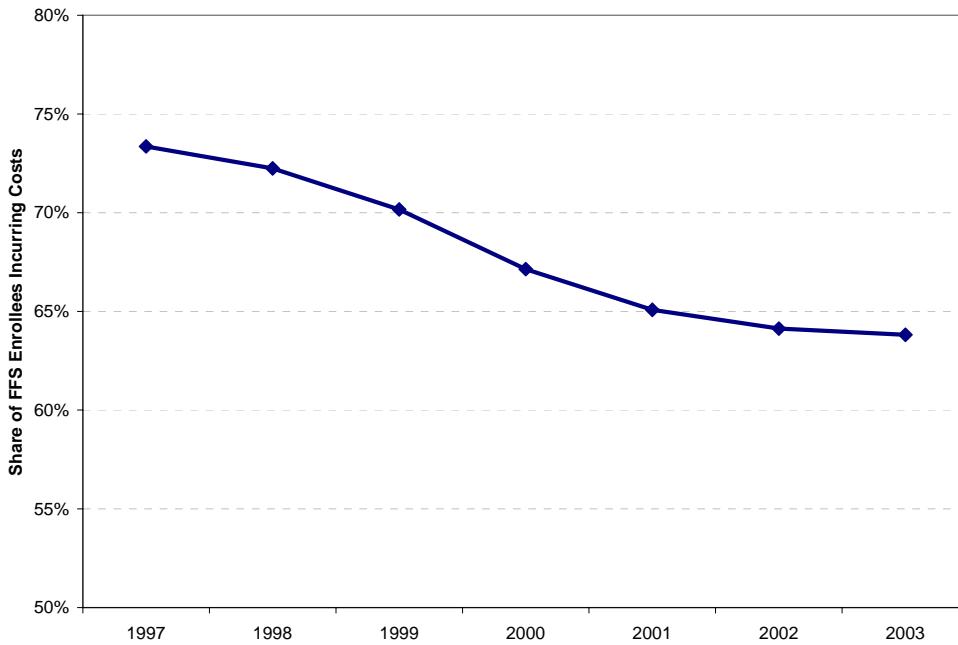
public assistance families. More important, it appears that those who were most likely to participate shifted to managed care – the drop in fee-for-service participation by families shows up only in counties that now offer Medi-Cal managed care. (The largest drop occurs in Los Angeles County.) Some of the decline in participation could be due to a rise in individuals or families still on the rolls but not actually eligible ("phantom" or false eligibles) and an increase in the number of people who are unaware that they are enrolled, because they left cash aid, for example. We cannot know the extent to which these drops reflect an increase in false eligibles, changes in the mix of Medi-Cal enrollees, or declines in actual use of services by enrollees. The fact that participation rates declined when total enrollment declined suggests that at least some of the decline was due to less use by enrollees. Future research should investigate the increase in the number of fee-for-service Medi-Cal enrollees who do not use services. Declines in actual use of services could reflect a generally healthier Medi-Cal fee-for-service population but could also arise from lack of access. The role of false eligibles and an increase in those unaware that they are enrolled should also be investigated.

The large share of enrollees who do not incur any costs means that the average costs presented in Figure 3.2 understate the average cost per enrollee that has any positive costs. Figure 3.9 shows the average expenditures per enrollee in each of the last seven fiscal years, excluding enrollees who did not incur any costs in a given year. In 2003, the average enrollee who incurred any costs incurred $4,737 during the fiscal year. Costs have risen rapidly for those with any costs, up 85 percent per enrollee in real terms since 1997. The growing gap between all enrollees and those with positive costs is driven in part by the falling rate of participation, but it also suggests that participation fell among those whose expenses were relatively low.

Figure 3.8
Share of Fee-for-Service Enrollees Incurring Any Costs,
by Age, 1997 and 2003
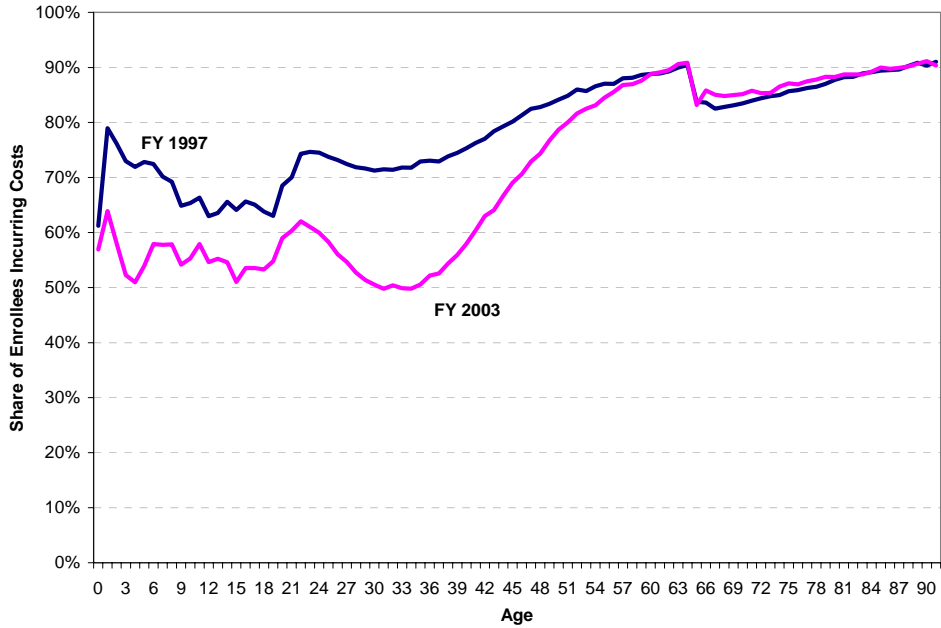
Figure 3.9
Average Annual Fee-for-Service Expenditures per Enrollee, 1997 to 2003
All Enrollees and Enrollees with Positive Costs
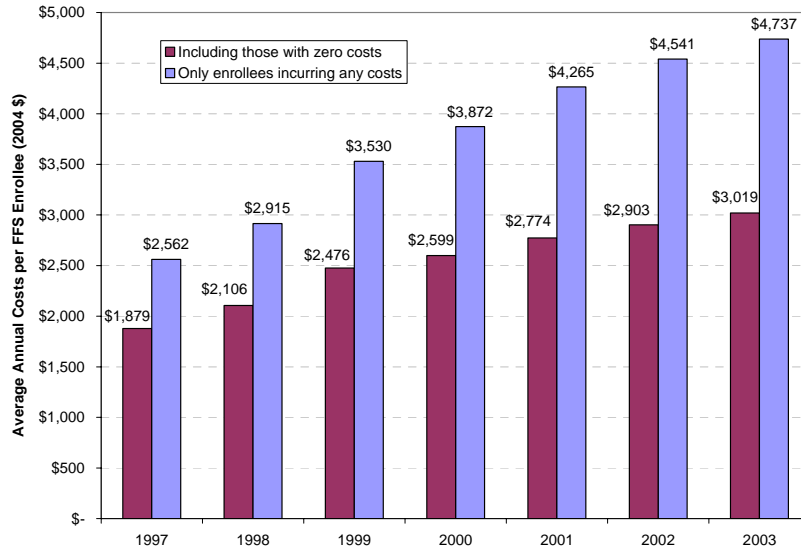
Costs by Percentile Group

Our average costs per enrollee, as shown above, include the zero-cost individuals. Of course, when a large number of people have zero costs, those with positive costs have much higher costs on average than is apparent from the overall average. To understand the distribution of costs, we order all enrollees each year by their costs in that year and examine the costs at different thresholds in this distribution. In each year, the bottom 25 percent of enrollees have no costs incurred, as we see in Table 3.1. In 2003, half of enrollees had incurred costs of less than $147 annually, and half had more than $147 annually. (Another term for the 50th percentile threshold is the median.) Table 3.1 shows that the median expenditures per enrollee were somewhat higher in 1997, at $192, than in 2003. This fall in the median does not suggest lower costs for care, but merely reflects the declining share of enrollees with any costs. However, the enormous difference between the median ($147) and the average or mean ($3019) indicates that the distribution of costs is highly skewed toward the upper end.

Fee-for-service Medi-Cal costs are concentrated in the very upper end of the distribution, as the other percentile thresholds in Table 3.1 make clear. Despite an average cost of $3019, three-fourths of enrollees incurred costs below $1763. At $6600, the costs for the 90th percentile are almost four times those at the 75th percentile. Costs at the 95th percentile are double those at the 90th percentile, and costs at the 98th percentile are more than 2.5 times as large as those at the 95th percentile.

Table 3.1
Annual Costs per Enrollee in Fee-for-Service,
Cutoff for Percentile Categories (2004$)

	25th Percentile	50th Percentile	75th Percentile	90th Percentile	95th Percentile	98th Percentile
1997	$-	$192	$947	$3,821	$7,215	$20,098
1998	$-	$191	$1,089	$4,265	$8,420	$23,235
1999	$-	$182	$1,303	$5,091	$10,605	$27,745
2000	$-	$153	$1,409	$5,458	$11,274	$28,996
2001	$-	$139	$1,475	$5,773	$11,845	$32,015
2002	$-	$143	$1,621	$6,231	$12,549	$32,750
2003	$-	$147	$1,763	$6,600	$13,166	$33,201

In fact, if we look at the distribution for each age level – ordering the enrollees at each age by their associated expenditures and then finding the median, 75th percentile, and so on for each age group – we find that for most ages, more than 75 percent of enrollees have costs below the average for that age group, again indicating the importance of the very high-cost enrollees even within age groups. As Figure 3.10 illustrates, the average or mean cost is close to the 90th percentile costs for the youngest children. At most non-elderly ages, the mean cost is just above the 75th percentile. Not until enrollees are older than 85 years old do we see costs for all enrollees of that age group rise sufficiently for the mean to fall below the 75th percentile. This means that costs are somewhat more uniform (uniformly high) among the very oldest enrollees, whereas costs for all other age groups are driven by the highest cost enrollees.

Figure 3.10
Annual Costs per Fee-for-Service Enrollees: Mean, Median, 90th and 75th Percentiles
by Age, 2003
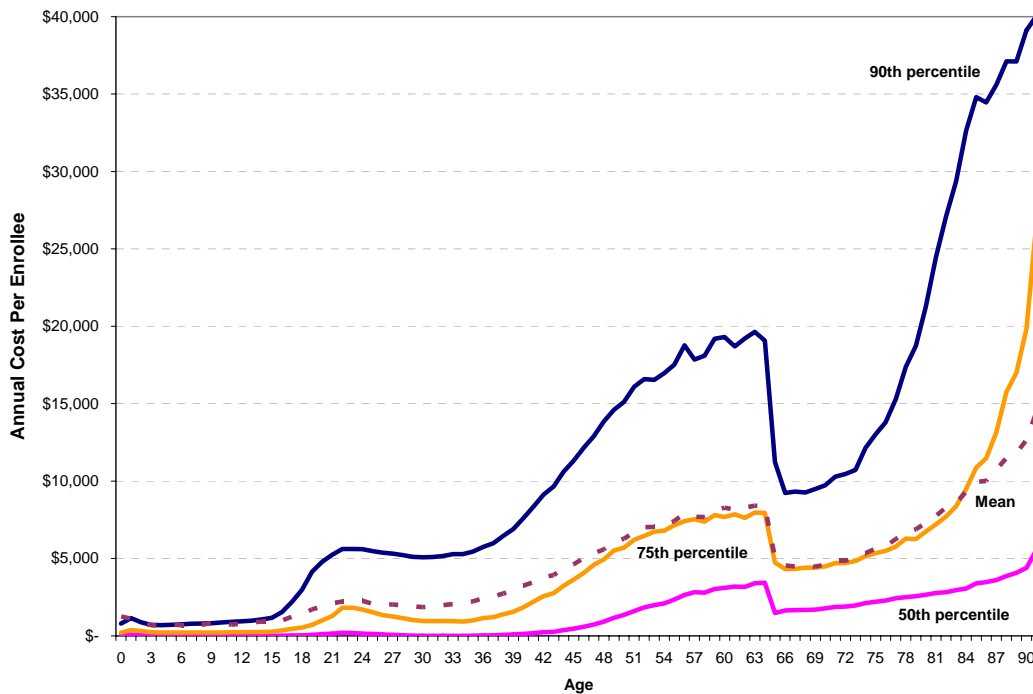
The distribution shown in Table 3.1 means that the total costs of the fee-for-service Medi-Cal program are highly concentrated in a small share of very expensive enrollees. We can see this more clearly by summing the costs for all enrollees in each of these groups and then examining what share of total costs are represented by that sum. Figure 3.11 shows this calculation for 2003. The first bar shows the share of enrollees in each of the percentile groups – this bar is simply a graphical representation of our percentile group definitions. The second bar, however, contrasts the share of enrollees with the shares of expenditures. The first 90 percent of enrollees account for only 24.3 percent of all expenditures. This means more than 75 percent of all expenditures occur in the most expensive 10 percent of enrollees. In fact, the most expensive 5 percent accounted for 60 percent of all expenditures. Finally, the most expensive 2 percent of enrollees accounted for 40 percent of expenditures.

This distribution of expenditures has actually been relatively stable over time, as shown in Table 3.2. There has been some dispersion, with the costs somewhat less concentrated in the top 2 percent of enrollees. In 1997, these enrollees accounted for 45 percent of costs, and the top 10 percent of enrollees accounted for 77 percent of all costs. However, a slightly higher share of expenditures was accounted for by the lower 75th percentile in 1997. In each year, there are no costs incurred by the first 25 percent of clients, as we saw in Figure 3.7, but those with zero costs represented the first 36 percent of enrollees in 2003. Thus in 2003, we have both a larger share of very inexpensive (zero-cost) enrollees, and more dispersion of costs spread among the most expensive enrollees. Still, even in 2003, the concentration of costs in the most expensive enrollees is remarkable.

Figure 3.11
Share of Enrollees and Share of Expenditures for Fee-for-Service Percentile Groups, 2003
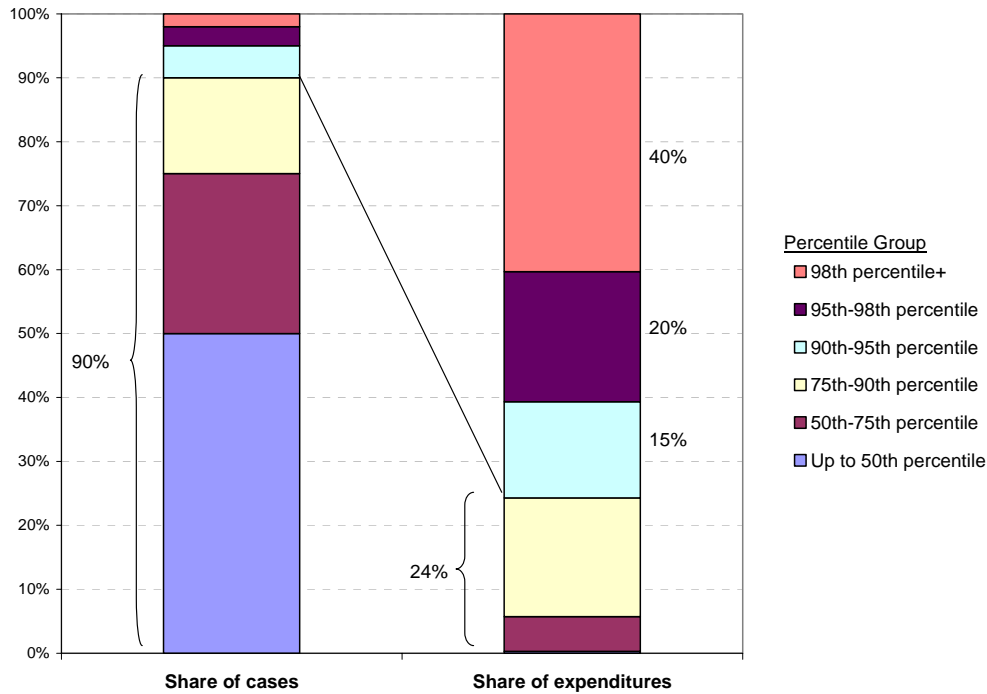
Table 3.2
Percentage of All Fee-for-Service Expenditures Incurred by Enrollees
in Different Percentile Categories (2004$)

	0 - 50th Percentile	50th to 75th Percentile	75th to 90th Percentile	90th to 95th Percentile	95th to 98th Percentile	98th + Percentile
1997	1.1	6.2	15.9	13.7	18.5	44.7
1998	0.9	6.0	16.5	13.8	19.4	43.4
1999	0.6	5.6	17.0	14.4	20.6	41.7
2000	0.4	5.4	17.6	14.7	20.7	41.3
2001	0.3	5.1	17.4	14.5	20.7	42.0
2002	0.3	5.3	18.0	14.9	20.5	41.0
2003	0.3	5.4	18.6	15.1	20.3	40.4

The concentration of costs in the very highest-cost enrollees suggests that policy solutions that affect the cost behavior of enrollees at the low end of the distribution will have little effect on the total costs of the program. If costs were cut *in half* for all fee-for-service Medi-Cal enrollees in the lowest three quartiles (up to the 75th percentile), then the total cost savings would be less than 3 percent.[13] Clearly a cut to this extent is not plausible (Of course, even modest cuts that reduced prevention, primary care, and diagnostic services could lead to higher

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[13] Even if we cut expenses in half for the lowest 75 percent of cases with costs (that is, up to the 75th percentile of all cases with any costs), the total saving would be only 7 percent.

costs in the long run.) To significantly affect total Medi-Cal costs, solutions must address the higher-cost enrollees.

Characteristics of Most Expensive Enrollees

The natural questions that arise from Table 3.2 are these: What types of clients are in the most expensive percentile groups? How do they differ from the lower-cost groups? To explore these questions, we compare the characteristics of the enrollees whose costs place them in the top 5 percent of cases (above the 95th percentile) to those whose costs place them in the lower half of the distribution (the 0 to 50th percentile).

As we would expect based on Figure 3.10, enrollees in the 95th percentile or above group are older on average than those below the median. Adults make up more than 90 percent of the most expensive group, compared to 44 percent of the below median expense group (Figure 3.12). Children 6 to 17, for example, represent 29 percent of enrollees in the below median group, but only 3 percent of the most expensive enrollees.

Figure 3.12
Age Breakdown of Bottom 50 Percent and Top 5 Percent of Enrollees by Annual Costs, 2003
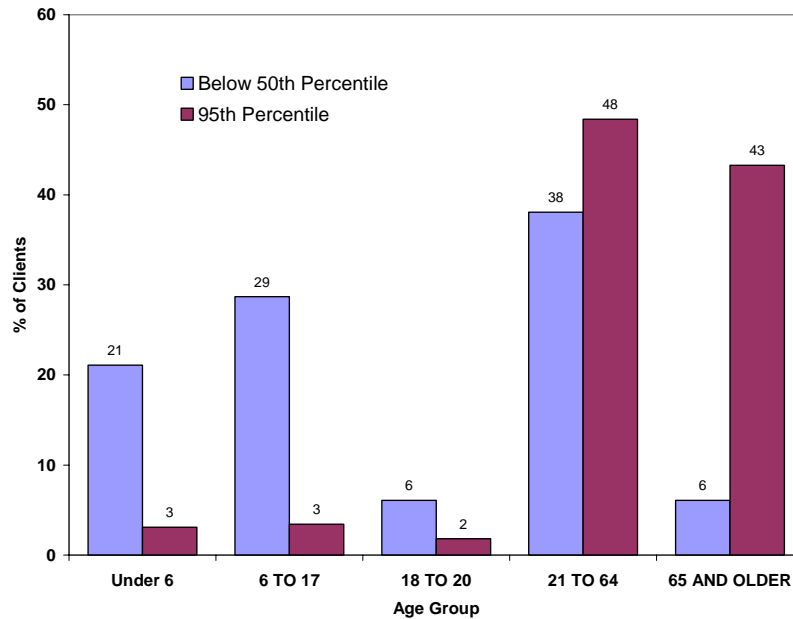
Enrollees in the family categories (public assistance families or medically-needy families) are rarely the expensive cases. These enrollees make up only 8 percent of the most expensive group, compared to 63 percent of the least expensive group (Figure 3.13). In contrast, the blind and disabled account for almost half of the most expensive enrollees, with the aged representing another third. These aid categories are underrepresented in the below-median cost group. The costs do not exactly map to the enrollee shares. Within the top 5 percent, blind and disabled enrollees account for 51 percent of the costs, or more than their share of enrollees in this group. Aged enrollees account for somewhat fewer costs than their share in this most expensive group, accounting for 31 percent of these top expenditures.

Figure 3.13
Aid Category Breakdown of Bottom 50 Percent and Top 5 Percent of Enrollees by Annual Costs, 2003
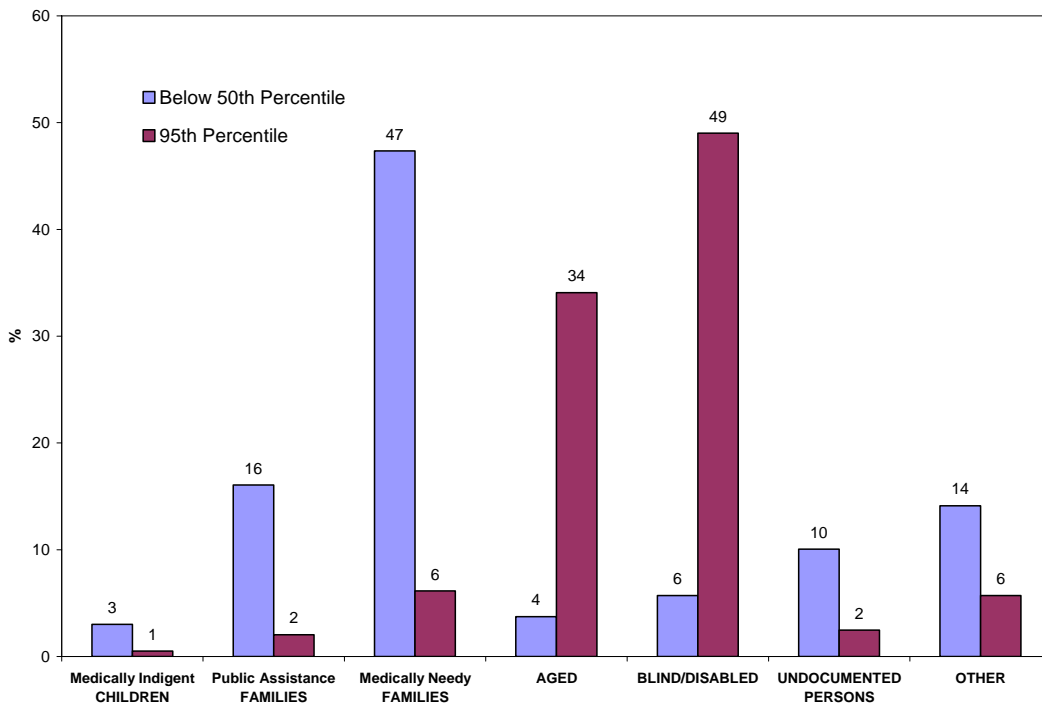
Figure 3.14
Share of Expenditures by Service Category for Bottom 50 Percent and Top 5 Percent of Enrollees by Annual Costs, 2003
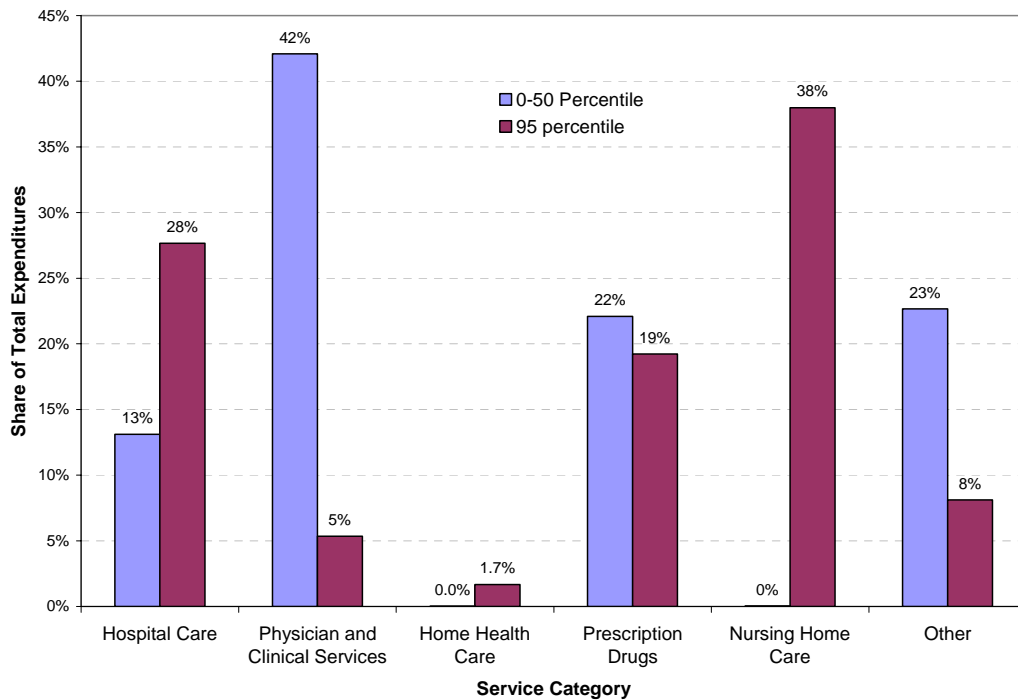
Finally, the mix of services used by the most expensive enrollees differs sharply from those used by the least expensive enrollees. Figure 3.14 shows the breakdown of expenditures by type of reimbursed health service or "service category." For enrollees up to the median expenses, physician services are the largest group of expenditures, at 42 percent. Claims for the most expensive five percent of enrollees are dominated by nursing home care and hospital care. The share of expenditures on prescription drugs are fairly similar between the two groups, accounting for around one in every five dollars of expenses.[14]

Figure 3.15
Share of Expenditures by Service Category for Top 5 Percent of Enrollees by Major Eligibility Category, 2003
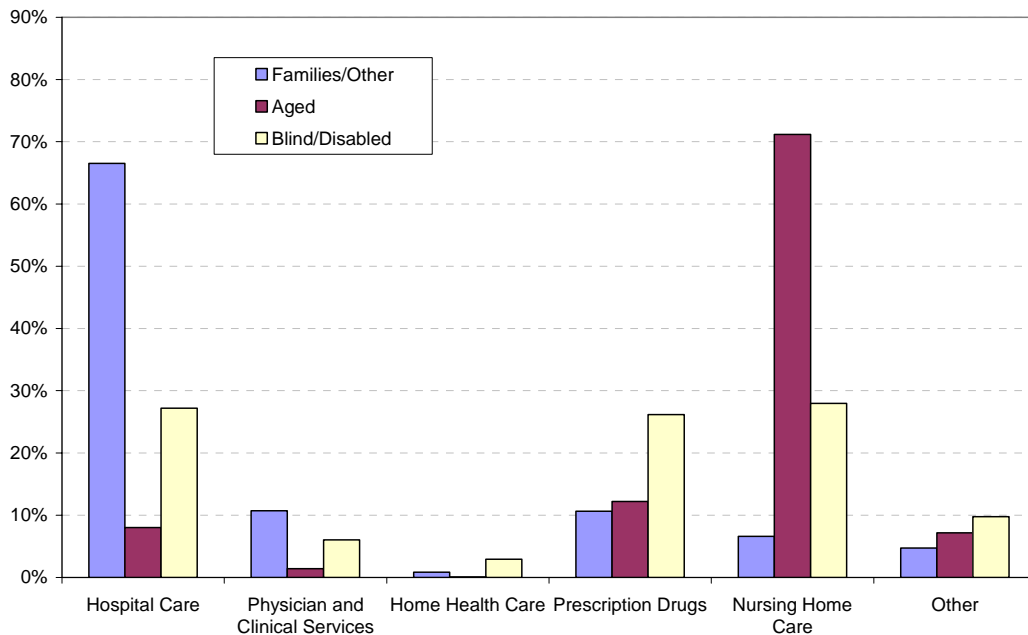
The overall expenditures by service category within the most expensive enrollees shown in Figure 3.14 actually represent the blend of aid groups. When we split this top expenditure category by major aid group, we find that enrollees in family eligibility groups end up in the highest expenditure categories due to hospital costs, which represent two-thirds of costs for these enrollees (Figure 3.15). For elderly in the most expensive group, the vast majority of costs go for nursing home care. For blind/disabled enrollees, the costs are less concentrated, with hospital care, prescription drugs, and long term care each representing about 25 percent of expenditures.

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[14]The "Other" service category includes other medical services (such as optometrist, chiropractor, midwife, physical therapist), intermediate care facility (for the developmentally disabled), medical transportation, and other services (such as hospice, durable medical equipment, out of state providers). Intermediate care facilities were not included with nursing home care to maintain consistency with CMS health expenditure categories.

Summary: Costs Per Enrollee

In 2003, Medi-Cal expenditures averaged $389 for each fee-for-service enrollee month and $133 for each managed care enrollee month. The absolute differences in costs between these two segments are largely related to the types of clients enrolled, especially the large share of children and families in managed care. Despite stagnant capitation rates in managed care, the growth rates in costs per enrollee-month are not dramatically different from those in fee-for-service. Over the 1997-2003 period, managed care costs per enrollee rose an average of 7.7 percent annually, compared to 9.3 percent annually in fee-for service. In three out of six years, costs rose more quickly in managed care than in fee-for-service.

For fee-for-service enrollees, for whom we have detailed claims information, we find that the average annual cost per enrollee rose from $1,879 in 1997 to $3,019 in 2003. However, this average masks significant differences by age. Costs for children were far lower, around $800-$900 annually, compared to $5,000 - $8,000 for the enrollees in their 40s and 50s, and $10,000 or more for the oldest adults (over 85 years of age). Moreover, costs for adults, especially those over 36, increased more in both percentage and absolute terms than those for children. In fact, if we follow a cohort over time, tracking costs as they age from 1997 to 2003, we find a much greater rise in costs by cohort than is seen in just cross-section comparisons by age. For example, expenditures for a 52-year old in 2003 were 59 percent higher than for a 52-year old in 1997, but expenditures for the average 58-year old in 2003 were twice as much as for the average 52-year old six years earlier. Costs increase with age partly because of the different eligibility mix by age. For enrollees in child and family eligibility categories, fee-for-service costs rose an average of 24 percent in real terms, compared to 46 percent across all blind/disabled enrollees and 38 percent across all aged enrollees.

Most striking are the findings for the distribution of costs. In 2003, 36 percent of fee-for-service enrollees incurred no costs for care. If we exclude these cases, the average annual cost per enrollee rises from $3,019 to $4,737. Counting those with zero costs, all enrollees in the three-quarters of the caseload with the lowest costs incurred less than $1,763 annually, and half incurred less than $147 annually. This means that even cutting costs in half for most enrollees would have very little effect on the total costs of Medi-Cal, lowering costs only 3 percent.

To significantly address the costs of Medi-Cal, it is necessary to address the costs of the highest cost enrollees. The top 5 percent of enrollees incurred more than 60 percent of all of the costs in fee-for-service Medi-Cal. Virtually all enrollees in the top 5th cost percentile are adults; 43 percent are 65 or older and 49 percent are blind or disabled (including some of those over 65). Services such as physician visits are a small share of the costs for these high-cost enrollees. Nursing home care represents 38 percent of all the costs incurred by the top 5 percent of enrollees and 70 percent of costs for the aged in this top group. Hospital care is the next most important category, accounting for 28 percent of all costs in the top group and two-thirds of the costs incurred for the small share of expensive enrollees drawn from the child and family eligibility groups.

4. Medi-Cal Benefits: Expenditure Projections through 2015

Just as enrollment growth and rising expenditures per enrollee have driven recent increases in Medi-Cal costs, we predict future expenditures on Medi-Cal benefits based on these two cost drivers. Because our projections are intended to reflect long-term trends, our projection period begins with 2007. This chapter starts with an overview of our forecasting approach. The resulting analysis provides a summary forecast for Medi-Cal benefit expenditures. We then break down this forecast along a number of different dimensions: fee-for-service and managed care, enrollee group, and service category. Finally, we explore how sensitive the forecast is to changes in assumptions on different components. The forecasts in this chapter focus on Medi-Cal benefits in the core fee-for-service and managed care programs. In the next chapter, we consider how these benefit projections translate to Medi-Cal expenditures overall.

There are several cautions to note regarding our projection approach. First, the forecast assumes no change in current state or federal policies. In doing so, it also does not account for the known policy change imposed by the implementation of the Medicare prescription drug benefit. Thus, the forecasts represent our best effort at predicting future expenditures of the state's current Medi-Cal program. Second, we assume that current enrollment rates by broad age and disability group will remain constant throughout the projection horizon. That is, we assume constant take-up rates over time; this assumption implies no meaningful changes in poverty rates, disability rates, or other characteristics that would influence eligibility for and enrollment in Medi-Cal. Third, we assume that average expenditures per enrollee for a service category grow at the same rate as projected by the Centers for Medicare and Medicaid Services (CMS) for Medicaid in the National Health Accounts. In the short-run, capitation rates and other politically negotiated elements could drive expenditure forecasts; in the long-run, however, California is not likely to experience substantially different growth rates in costs than those in the rest of the nation. We do provide scenarios in which California growth rates are somewhat lower and somewhat higher than those projected by CMS. Fourth, consistent with national projections, we do not adjust for inflation, so the forecast reflects future expenditures in nominal rather than real terms. Moreover, the projection represents the expenditures on services provided in a fiscal year, rather than costs paid out in that year. Our expenditure calculation is thus fundamentally different from the calculations developed by the California Department of Health Services, which uses a cash rather than accrual basis.

Baseline Forecast Approach

Our forecast is built from a flexible framework that accounts for the mix of services used by different enrollees and then applies assumptions on the cost drivers for Medi-Cal to determine future expenditures in the program. (A detailed discussion of the general forecast framework and intermediate results for this forecast are provided in Appendix B.) Simply put, the baseline forecast projects expenditures for six categories of health services (hospital care, physician and clinical services, home health, prescription drug, nursing home, and other services) and six enrollee groups (disabled children, non-disabled children, disabled adults, non-disabled adults, disabled aged/elderly, and non-disabled aged/elderly). There are four

core building blocks of the forecast, some of which we observe directly from data and some we obtain through simplifying assumptions:

1. *Initial levels of expenditures in each service category for enrollee groups* – Using claims data from the '35' Paid Claims File, we directly calculate fee-for-service expenditures (claims) by service category and enrollee group in 2003 (the base year). We do not have equivalent information for managed care expenditures, although Medi-Cal budget information provides the division of expenditures between managed care and fee-for-service, and the MEDS data identify enrollment by age group in each type of Medi-Cal. We therefore assume that the distribution of expenditures by enrollee types and service categories in managed care mimics that of an equivalent population of enrollees covered by fee-for-service, adjusting to account for differences in services covered by fee-for-service and managed care.[15] This adjustment therefore incorporates the lower costs associated with managed care that are attributable to age differences and service differences. We also assume that the enrollment patterns for managed care and fee-for-service remain unchanged. Our projections of fee-for-service costs do include fee-for-service costs billed by enrollees who are covered by a managed care plan ("carve-outs"). Dental costs (both fee-for-service and dental plan coverage) are not included in our core "benefits" projection, but are accounted for by our "inflation" from core benefits to total Medi-Cal budget (see Chapter 5).

2. *Shares of the Medi-Cal budget spent on the six service categories and the six enrollee groups in 2003* – Using the levels of expenditures calculated for (1) above, we can also calculate the second element of the forecast, the shares of the budget spent on each of the six service categories and each of the enrollee groups in 2003.

3. *Growth rates of enrollment* – Total enrollment in Medi-Cal is the first major driver of costs in the forecast model. Our enrollment rate in the base year is calculated using enrollment levels from the MEDS data divided by population. For this baseline forecast, we assume that take up of Medi-Cal (enrollment rates) remains constant for each age and disability group. This in turn implies that the growth in each group of enrollees corresponds to the growth of the group in the overall projected California population. Our population projections are from the California Department of Finance 2004 series.

4. *Growth rates of average expenditures per enrollee in each service category* – Finally, we need projections of the growth rate in average expenditures per enrollee in each service category.[16] As a baseline, we use national projections of health service cost increases. In particular, we assume that average expenditures per enrollee for a service category grow at the same rate as projected by the Centers for Medicare and Medicaid Services (CMS) for Medicaid in the National Health Accounts. As a simplification, we also assume that, within health service categories, the growth rates in average expenditures per enrollee are the same

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[15] The fee-for-service levels include direct payments to hospitals and drug rebates received by the state, as obtained from Local Assistance Estimates published by DHS.

[16] as described in Appendix B, the framework allows for growth in average expenditures per enrollee to be further divided into growth in prices and growth in service utilization. This baseline forecast examines total growth in per-enrollee expenditures. Thus, growth rates incorporate both price increases (inflation) and increased service utilization per enrollee.

for each age group, although the levels of expenditures differ by age groups. Although we project that California's expenditures per enrollee will remain below the national average, it is hard to justify how future long-term *growth rates* in expenditures by specific service categories could be dramatically different in California than in the rest of the nation. California's managed care enrollees have experienced slightly lower growth rates from 1997 to 2003 than fee-for-service enrollees, but the difference is small (8 percent versus 9 percent). Moreover, lower growth rates in California in the past could simply reflect program expansions, with more lower-cost users added to managed care systems. Finally, the national projections by CMS are generated based on a current-law approach (like ours) and incorporate the recommendations of a technical review panel that considered the long-term historical record in per-capita health spending (Technical Review Panel 2000).[17] We also provide alternative projections that include a scenario in which California experiences growth rates that are somewhat lower than those in the rest of the nation.

The overall growth in Medi-Cal expenditures is determined by the share-weighted growth in expenditures per enrollee by service category and the growth in enrollment by age group.   These growth rates are then applied to the initial levels of expenditures to project the future cost of Medi-Cal fee-for-service and managed care benefits, which sum to the total future cost of Medi-Cal benefits.

Projected Expenditures on Medi-Cal Benefits

Our core forecast of the growth in expenditures on Medi-Cal benefits projects that expenditures on Medi-Cal will grow at least as quickly in the next five years as they have over the last five years: As shown in Figure 4.1, we estimate that by 2010, Medi-Cal benefit costs will rise to $37.6 billion, a 54 percent increase in five years. This compares to a 51 percent increase in nominal terms from 2000 to 2005. (Note that overall expenditures have increased fairly consistently in recent years despite the decline and then increase in enrollment rates.) Expenditures will rise somewhat less quickly in the following five years from 2010 to 2015, increasing 48 percent to $55.5 billion. The average annual growth rate over the entire period is approximately 8.6 percent. Note that these are nominal increases, so the cost in real terms (inflation adjusted) will be lower. The following discussion breaks down this core forecast by different components.

In this forecast, managed care costs grow at nearly the same rate as fee-for-service expenditures, even though the projections for managed care and fee-for-service are constructed separately. We estimate that fee-for-service expenditures will grow about 8.7 percent annually, compared to about 8.1 percent growth in managed care. In other words, our "no-policy-change" scenario assumes that the present controls on capitation rates are not maintainable. We assume increases in managed care capitation rates, matching the parallel expenditure increases in fee-for-service care (by service category and enrollee group).

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[17] The 2000 technical review panel observed that real per-capita health spending has grown more than 1 percent faster than real gross domestic product per capita for any ten year period since records have been kept (from the 1940s onward). The latest projections by CMS show faster public-sector spending growth (including Medicaid) than private-sector growth (Heffler et al 2005).

Figure 4.1
Total Medi-Cal Benefit Expenditures
by Fee-for-Service and Managed Care,
Historical and Projected 2003, 2010, 2015
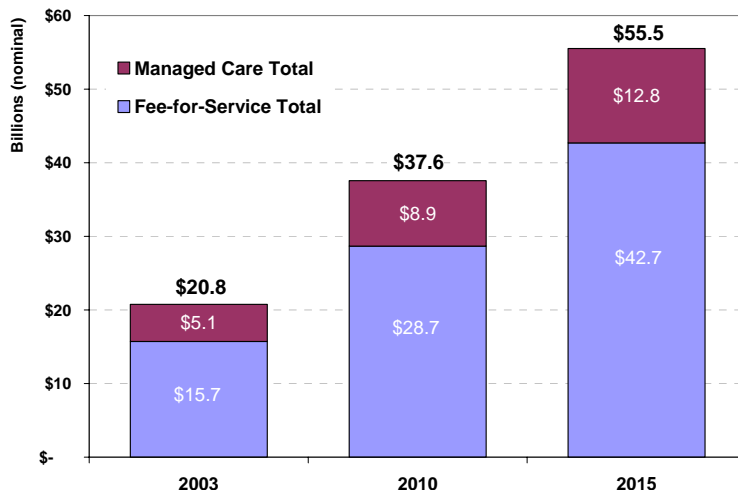
To get a sense of the significance of this assumption, consider that out of the projected $37.6 billion in benefit costs in fiscal year 2010, almost $8.9 billion are managed care expenditures. This forecasts a $3.8 billion increase in managed care costs compared to 2003 budget documents. Only 10 percent of this increase is associated with projected enrollment growth – the remaining 90 percent reflects increases in capitation rates. If the state is able to continue to hold down capitation rates, the actual expenditure increases may be lower. However, the significant gap between the projected costs with and without increased capitation rates suggests that zero or even inflation-based increases in capitation rates will not be feasible. Our projection finds that the gap between fee-for-service growth rates and managed care growth rates will fall from the 1.6 percent annual difference in the 1997 to 2003 period to a 0.6 percent difference.

Even in fee-for-service, our "no policy change" scenario implies greater cost increases per enrollee than experienced in recent years. As noted in the distributional analysis, median costs per enrollee fell between 1997 and 2003, in part because the share of enrollees with no costs increased (although average costs per enrollee rose substantially). This suggests that the enrollment decline in fee-for-service over this period retained lower-than-average cost enrollees, holding down total cost increases per enrollee. Our cost increases for fee-for-service are higher than experienced in recent years in part because we assume that enrollment rates will not continue to fall.

Over ten years, the differences in projected growth rates in managed care and fee-for-service are too small to have significant effects on the share of total costs in each category. Our projections suggest that managed care will fall from 24 percent of all expenditures to 23 percent of all expenditures. Hence in 2015, we forecast that under existing regulations, California will spend $42.7 billion on fee-for-service benefits and $12.8 billion on managed care.

Our projections suggest that the share of cost growth attributable to children and youth (up to age 18), adults (aged 18 to 64), and the elderly (65 years or older) will roughly match these groups' shares in total costs in 2005: Youth represented 18 percent of total costs in 2005 and will account for 17 percent of the growth in costs, whereas the elderly represented 27 percent of costs in 2004 and will account for 28 percent of the growth in costs. These shares obviously differ from their shares in the enrollee population. Therefore, in 2010, Medi-Cal expenditures on youth will total $6.8 billion, expenditures on adults will total $20.7 billion, and expenditures on the elderly will total $10.1 billion (Figure 4.2). The share of total expenditures for disabled individuals varies with age group: 38 percent for children, 61 percent for adults, and 20 percent for the elderly (in 2005). Overall, not quite half of all Medi-Cal expenditures are for disabled enrollees. Although we find higher rates of cost increases for disabled individuals than for the non-disabled (Table 4.1), these differences are not large and do not lead to a substantial shift in the share of total expenditures for disabled enrollees.[18]

Figure 4.2
Total Medi-Cal Benefit Expenditures by Enrollee Group,
Historical and Projected 2003, 2010, 2015

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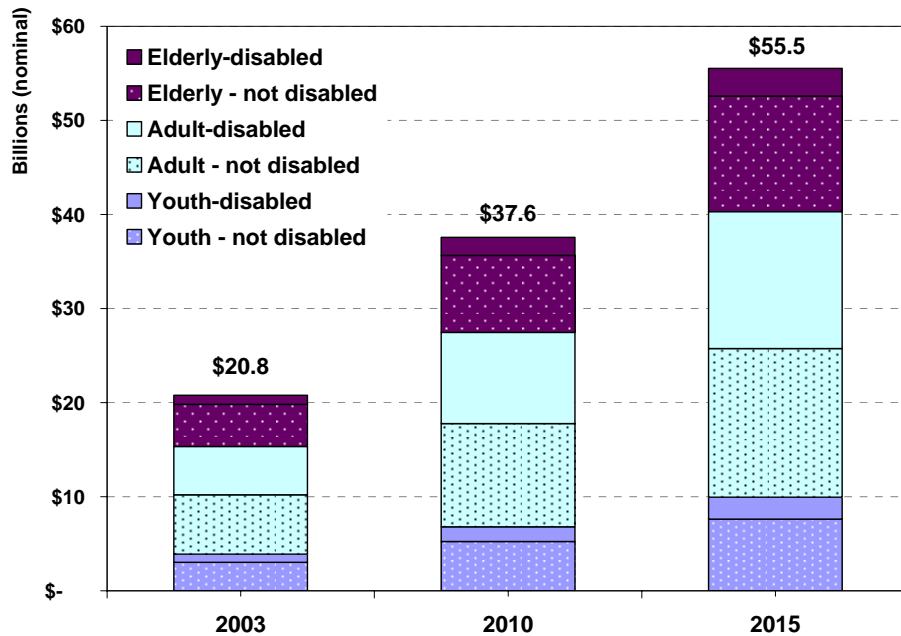
[18] However, our broad service categories may not adequately capture the true differences in cost drivers between disabled and non-disabled enrollees.

Table 4.1
Average Annual Rate of Growth in Benefit
Expenditures by Enrollee Group,
Projections 2005-2015

	Disabled	Not disabled
Youth	8.6%	8.5%
Adult	9.1%	7.9%
Elderly	9.6%	8.8%
All age groups	9.1%	8.4%

In contrast, we find significant differences in the annual rates of growth by service category, which result in a change in the composition of costs by category between 2003 and 2015. As Table 4.2 reports, the projected average annual growth rates are lowest for hospital and nursing home care. Physician visits and prescription drugs both have higher than average rates of expenditure growth. As a result of the different growth rates, hospital care costs will fall to only 34 percent of expenditures in 2015 from 46 percent in 2003 (Figure 4.3). Nursing home costs will also represent a smaller share of expenditures, 15 percent instead of 18 percent. Prescription drug costs, however, are projected to rise to 24 percent of all expenditures, up from 17 percent in the most recent expenditure data.

Table 4.2
Average Annual Rate of Growth in Expenditures by Service Category,
Projections 2003-2015

Service Category	Average Annual Growth Rate
Hospital Care	5.9%
Physician & Clinical	10.9%
Home Health	7.8%
Drugs	11.4%
Nursing Home	6.8%
Other	14.0%
All categories	8.5%

The compositional changes shown in Figure 4.3 can also be seen in the breakdown of total expenditures in the forecast years as shown in Figure 4.4. As with managed care, the calculations of expenditures by service category assume that price pressures will prevent California from continuing to contain costs through flat or reduced reimbursement rates. As one example, low reimbursement rates for hospital claims are currently offset by other hospital payments, such as payments to disproportionate-share hospitals (DSH payments). The forecast in Figure 4.4 assumes growth in the total expenditures for hospital services. In this scenario, holding down claims reimbursement rates would require higher DSH or other payments to hospitals, and vice versa. If other hospital payments were kept flat, rather than allowed to rise to augment reimbursement rates, hospital costs would be $1.7 billion lower in 2010 than projected in Figure 4.4, $8.6 billion instead of $10.3 billion.

Figure 4.3
Share of Projected Medi-Cal Benefit Expenditures
by Service Category, 2003, 2010 and 2015
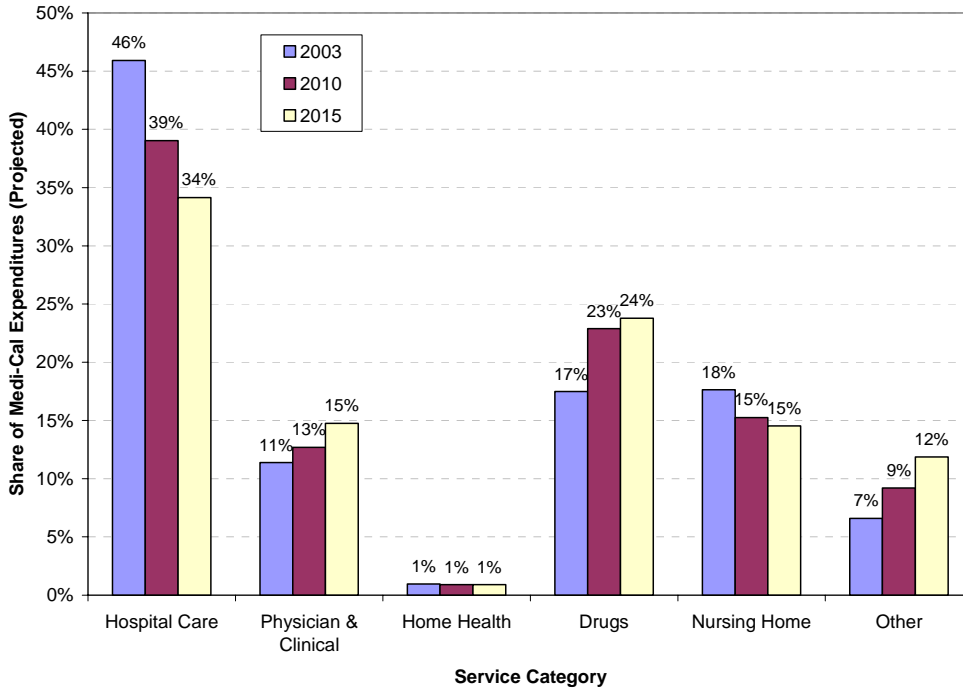
Figure 4.4
Total Medi-Cal Benefit Expenditures by Service Category,
Historical and Projected 2003, 2010, 2015
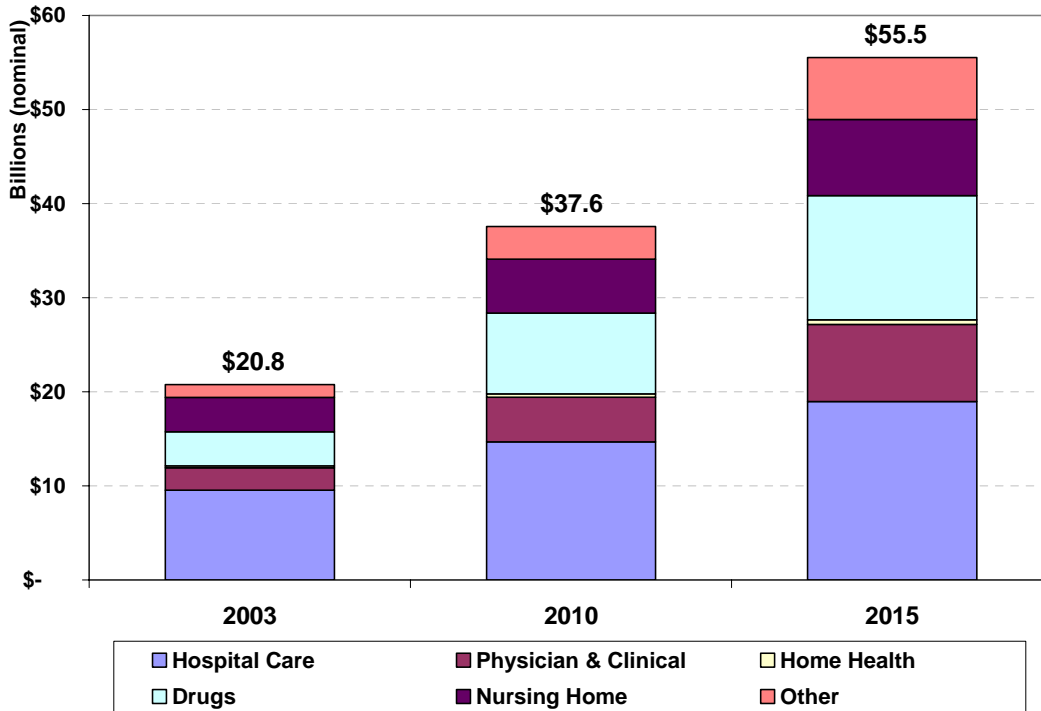
Sensitivity of Forecasts of Medi-Cal Benefit Expenditures

The results presented in the preceding figures are obviously dependent on the accuracy of the forecasts of the underlying growth rates in per-enrollee expenditures by service category and enrollee population growth. For this reason, it is valuable to explore how sensitive the model is to changes in these growth rates. In doing so, we can both assess the stability of the estimates and identify the most important influences in the forecast – the key "cost drivers" for the projected expenditures.

To test the sensitivity of the forecast, we evaluated the effects in the final year of the forecast (2015) of a 10 percent increase or decrease in the growth rates for each of ten growth factors: the six average-cost growth rates for expenditures by service category, the three enrollee age-group growth rates, and the growth rate of the enrollee population at large. A 10 percent decrease is roughly equivalent to the average difference between the U.S. and California in annual growth in personal health care spending 1980 to 1998. Therefore, using the lower bound results from the sensitivity tests for the service categories is roughly equivalent to assuming that Medi-Cal expenditures continue to exhibit the same slower growth relative to the national expenditures.

For each test, we recalculated the fee-for-service and managed care forecasts to determine a new projected value for 2015. The differences between the new forecasts and the 2015 baseline forecast are plotted in Figure 4.5. The resulting tornado diagram is ordered with the most influential factor at the top and the least influential at the bottom.

Figure 4.5
Changes From Baseline Forecast Due to +/- 10% Change in Factor Growth Rate ($ millions)
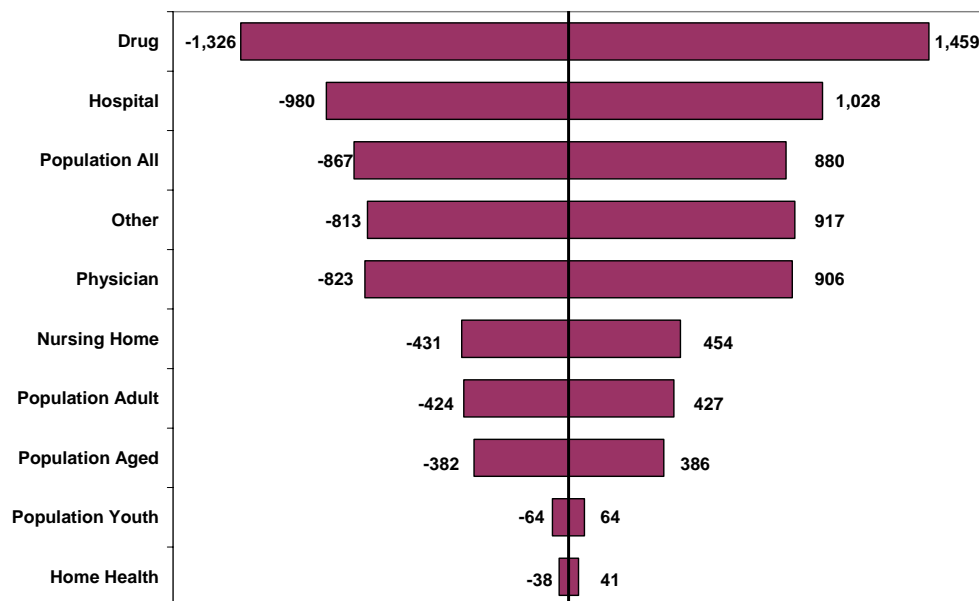
The factors that have the most influence on the forecast are elements with large expenditure shares, high growth rates or both. Thus, growth in prescription drug costs per enrollee has the biggest effect of the model. If the growth rate in prescription drugs were 10 percent higher than we assumed – that is, if prescription drug costs grew 11.9 percent annually instead of 10.8 percent annually – then the total costs would go up by $1.46 billion more than captured in our baseline estimate. Conversely, if drug costs grew only 9.8 percent, the baseline projection would fall by $1.33 billion.   Although hospital care has a lower-than-average rate of growth, the importance of hospital care as a share of costs means that a 10 percent change up or down in the growth rate (up to 6.5 percent or down to 5.4 percent) would swing the total projection up or down by about $1 billion. Enrollee population growth is the third most influential factor, where a growth rate range of 7.6 to 9.4 percent would shift the total projection up or down by about $900 million.

Taken together, these differences are not trivial. For example, if growth rates for each factor other than population were reduced by 10 percent, fee-for-service and managed care benefit expenditures would fall by $4.5 billion from our baseline forecast for 2015 ($51.0 billion instead of $55.5 billion). Greater increases or decreases would result in proportionally greater or lower alternative forecasts. For example, a 20 percent increase or decrease in the growth rates would lead to projected differences from the baseline forecast that are twice those shown in Figure 4.5. With a 20 percent reduction in growth rates except those for population, the projected increase in benefit expenditures between 2005 and 2015 would be only $22 billion instead of the $31 billion of the baseline forecast.

Figure 4.6
Components of Growth in Medi-Cal Benefit Expenditures, 2005-2015
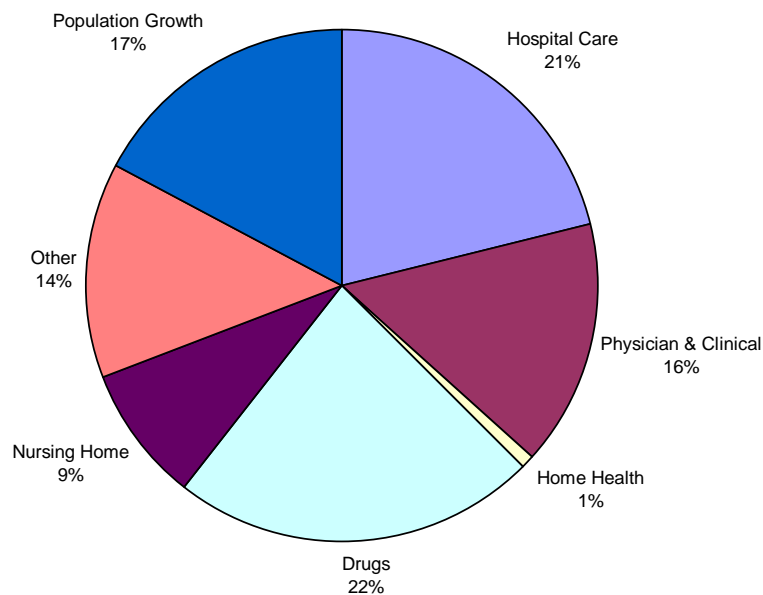
Overall, the vast majority of increases in Medi-Cal benefits can be attributed to cost increases rather than enrollment increases. Specifically, population growth and thus enrollment growth account for 17 percent of total expenditure increases between 2005 and 2015 (Figure 4.6). Increases in drug costs and hospital costs account for the largest share of increased costs. These increased costs are a product of changes in both the quantity of services and the price of services per enrollee.

Summary: Projected Expenditures on Medi-Cal Benefits

Our baseline forecast projects that expenditures on Medi-Cal benefits will rise to $37.6 billion in 2010 and $55.5 billion in 2015 in nominal dollars, an annual growth rate of 8.6 percent. Enrollment growth driven by population increases accounts for 17 percent of this projected growth, assuming no change in Medi-Cal take-up rates. The remaining 83 percent of the expenditure growth is in higher costs per enrollee, including both increased use of services and higher prices per service. Growth rates will be highest in prescription-drug expenditures and in physician and clinical costs, and lowest for hospital care. However, because hospital care accounts for a large share of cost, this service category is second only to prescription drugs as an overall driver of additional expenditures. This projection does not account for a reduction in drug coverage through Medi-Cal due to the Medicare drug benefit.

This forecast assumes that rather than the 1.6 percentage-point difference between Medi-Cal managed care and fee-for-service expenditure growth rates seen in recent years (7.7 percent versus 9.3 percent), managed care costs will grow 8.1 percent compared to 8.7 percent annual growth in fee-for-service costs. Thus, this forecast assumes that managed care capitation rates cannot continue to be held flat (without impact on access to care). The similarity in these growth rates means that managed care as a share of benefit expenditures will fall only slightly in the absence of policy change.

Because the forecast covers only ten years, it ends before baby boomers move into the age range with the greatest costs in Medi-Cal, the 75-years old and older group. For this reason, the share of expenditures by age group does not shift significantly. While cost increases are projected to be slightly higher for disabled individuals, again the difference is not enough to have a noticeable effect on the proportion of costs accruing to this population.

Although the initial levels and shares of expenditures by population group and service category are all based on California values, our forecast uses national projections on the growth rates in expenditures per enrollee in each of these categories. Historically, California has had about 10 percent lower growth rates in health care spending. Our sensitivity analysis suggests that 10 percent lower growth rates in all service categories would lower the total expenditure forecast for 2015 from $55.5 billion to $51.0 billion.

5. Medi-Cal as a Share of California Revenues

The cost projections shown in Chapter 4 are forecasts of expenditures on Medi-Cal benefits. To conclude, this chapter uses these projections as a basis to explore how much of the expected future General Fund revenues will need to be devoted to Medi-Cal in the absence of Medi-Cal Redesign or other major policy changes to the Medi-Cal program.

Medi-Cal Benefits as Share of All Medi-Cal Expenditures

To understand the future costs of Medi-Cal relative to California state revenues, we need to make two key adjustments. First, the Medi-Cal budget includes a number of costs over and above the fee-for-service and managed care benefits described so far. Second, since our major concern is Medi-Cal as a share of the General Fund, we need to remove the federal share of costs.

Our adjustments from the baseline Medi-Cal forecast to General Fund expenditures draw on the data shown in Table 5.1. Medi-Cal benefits (combined fee-for-service and managed care) accounted for 70-to-73 percent of total Medi-Cal expenditures between 1999 and 2003. Because there is no strong trend during this period, we assume that Medi-Cal benefits will continue to be a fixed proportion of the total Medi-Cal expenditures. We use 2003, the last year with complete data, to fix this proportion at 69.8 percent. Therefore, we inflate our Medi-Cal benefits forecasts by a factor of 1.43 (the inverse of 69.8 percent) to translate into projections of the entire Medi-Cal budget.

Table 5.1
Relationship between Medi-Cal Benefit Expenditures, Total Expenditures
and General Fund Expenditures
Actual 1997-2003 ($ in millions)

| Year	(A) Total Medi-Cal Expenditures	(B) Fee-for-Service & Managed Care Expenditures	(B/A) Share in Fee-for-service & Managed Care	(C) General Fund Expenditures	(C/A) Share in General Fund
1999	$20,155,047,000	$ 14,655,937,628	72.7%	$7,475,002,000	37.1%
2000	$22,108,707,000	$ 16,133,169,241	73.0%	$8,098,713,000	36.6%
2001	$24,345,393,000	$ 17,596,541,792	72.3%	$9,190,894,000	37.7%
2002	$27,083,020,000	$ 19,347,851,588	71.4%	$9,791,803,000	36.2%
2003	$29,789,858,000	$ 20,781,366,864	69.8%	$10,885,270,000	36.5%

SOURCE: Author calculations and budget figures from California Department of Health Services.

The share of the total Medi-Cal budget paid out of General Fund revenues has varied slightly over time, from 37.1 percent in 1999 to 36.5 percent in 2003. Again, we choose the 2003 value to treat as the fixed proportion of total Medi-Cal revenues paid out of the General Fund.

Based on this assumption, we take the General Fund costs as 36.5 percent of the projected total Medi-Cal expenditures calculated from our Medi-Cal benefits forecasts. Figure 5.1 compares the three projected trends. In 2010, our forecast of $37.6 billion in Medi-Cal benefits translates to $53.9 billion in overall Medi-Cal expenditures in California, $19.7 billion of which are paid from the General Fund. In 2015, the $55.5 billion forecast for Medi-Cal benefits maps to $79.6 billion in total expenditures, with $29.1 billion out of the General Fund.

Our projections of the growth rate in General Fund expenditures are higher than those of the Legislative Analyst's Office (California Legislative Analyst's Office, 2004). The LAO places average annual increases at 6.1 percent between 2005 and 2010,[19] while our projections suggest Medi-Cal General Fund increases will average 8.5 percent annually over that same time period. The LAO projections are based on assumptions of 5-to-7 percent annual increases in per-enrollee costs for the aged, blind, and disabled but less than 3 percent annual increases for families and children. As with our projections, the LAO assumes stable enrollment rates with total enrollment growing with population.

Figure 5.1
Actual and Projected Fee-for-Service and Managed Care Benefits, Total Medi-Cal Expenditures and General Fund Medi-Cal Expenditures, 1997 to 2015
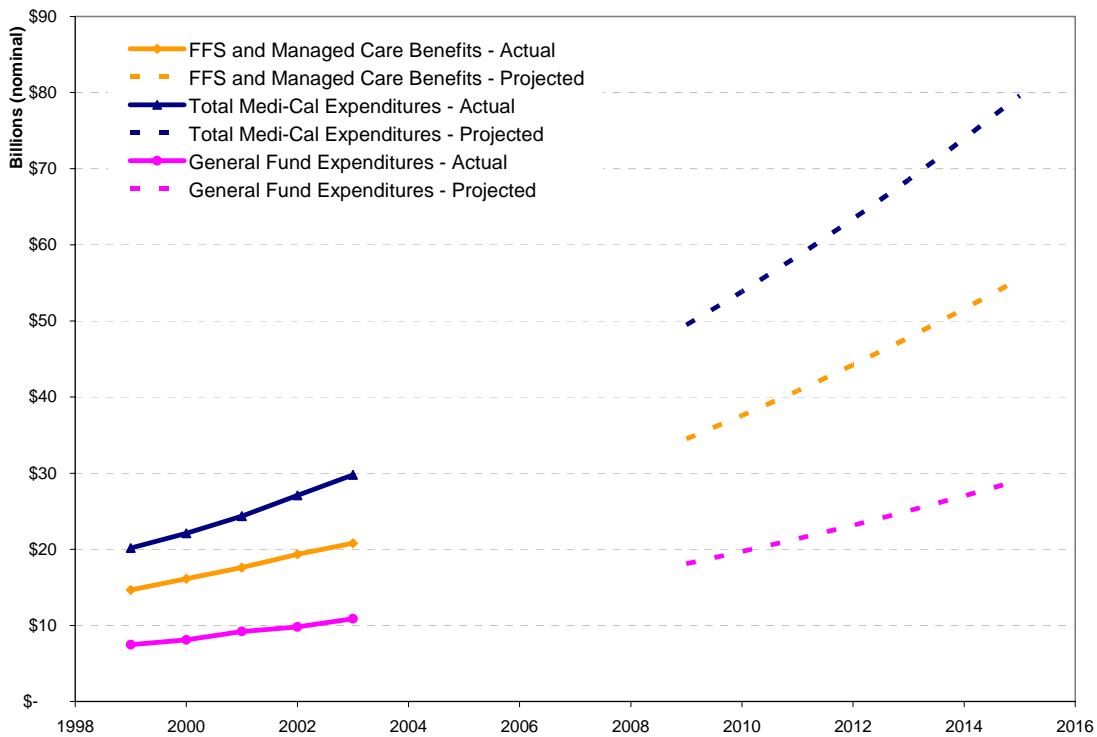
Alternative assumptions regarding growth rates in Medi-Cal expenditures that arise from elements of the Medi-Cal budget in departments outside of DHS do not result in substantively different projections for Medi-Cal General Fund expenditures. This is because

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[19] LAO's projections begin with the 2005-2006 fiscal year. For the four year period to 2009-2010, they project average annual increases of 5.5 percent.

large shares of expenditures for these other elements of the Medi-Cal budget are from sources other than the General Fund. A 10 percent increase or decrease in growth rates for these other elements of the Medi-Cal budget would change total Medi-Cal expenditures in 2015 by about $1 billion (out of $80 billion total) and would change General Fund expenditures by less than $150 million (out of $29 billion).

General Fund Expenditures Relative to Projected Revenues

To place these findings in a larger fiscal context, we compare our projections of Medi-Cal General Fund expenditures to revenue forecasts for the state. A growing population, economic growth, and inflation will lead to increases in General Fund revenues. We rely on the revenue forecasts developed by LAO for their November 2004 fiscal-outlook analysis and reproduced in Table 5.2 below. Their revenue forecasts go through 2010; we follow LAO practice and assume a 6 percent growth in revenues from 2010 to 2015. This assumption yields a projection for General Fund revenues in 2015 to reach $140.5 billion, up from $75 billion in 2004 and $105 billion in 2010.

Table 5.2
LAO Projections of State General Fund Revenues, 2004 - 2010
(Millions, Nominal)

Fiscal Year	Personal Income Tax	Sales and Use Tax	Corporation Tax	Other Revenues and Transfers	Total
2004	$36,200	$23,720	$7,480	$7,600	$75,000
2005	$39,640	$25,340	$8,730	$5,174	$78,884
2006	$42,210	$26,630	$9,170	$4,237	$82,247
2007	$44,810	$28,150	$9,730	$4,659	$87,349
2008	$47,960	$29,870	$10,270	$4,996	$93,096
2009	$51,400	$31,570	$10,860	$4,459	$98,289
2010	$55,050	$33,400	$11,510	$5,043	$105,003

SOURCE: Legislative Analyst's Office, *California's Fiscal Outlook: LAO Projections, 2004-05 Through 2009-10.*

Given that we project an 8.5 percent annual growth rate in Medi-Cal expenditures and LAO projects a 6 percent annual growth in revenues, the obvious conclusion is that Medi-Cal will absorb a growing share of the California budget over the next ten years. We estimate that Medi-Cal will grow from 15 percent of General Fund revenues in 2003 to 19 percent of General Fund revenues in 2010 and to 21 percent of General Fund revenues in 2015, as shown in Figure 5.2. If Medi-Cal stayed at only 15 percent of the General Fund by 2010, the expenditures would be $16 billion instead of $19.7 billion. This means that Medi-Cal will require an additional $3.7 billion out of the General Fund than we would predict if the proportion remained unchanged from 2004 on -- $3.7 billion that will need to come out of other parts of the state budget or from an increase in taxes. By 2015, the additional revenues required rise to $7.7 billion, since Medi-Cal General Fund costs are projected at $29.1 billion rather than the $21.4 billion expected if there is no change in proportions.

As noted earlier, California has typically had about 10 percent slower growth in health care spending than the national average (CHCF, 2005). By relying on the national growth rate projections, we are implicitly assuming that California's slower growth is not maintainable. Medi-Cal expenditure growth has been slowed by the state's limits on managed care capitation rates, physician-reimbursement rates and similar cost containment efforts. Over the long run, it is unlikely that these containment efforts can be sustained without affecting access to care. As Medicaid policy is argued at the national level, it is also important for California to have a forecast that can be linked back to the national forecasts.

If we instead assume that California health-care expenditures will continue to grow 10 percent more slowly than the national rates – at 7.65 percent annually rather than 8.50 percent annually – the projected costs for Medi-Cal are lower. Under this alternative assumption, we project that Medi-Cal benefits will total $35.8 billion in 2010 and $51.0 billion in 2015 instead of $37.6 billion and $55.5 as in the baseline. Repeating the calculations for Figure 5.2, this alternative implies that Medi-Cal will rise to 17.8 percent of the General Fund by 2010 and 19.0 percent by 2015.[20]

Figure 5.2
Actual and Projected General Fund Medi-Cal Expenditures
as Share of General Fund Revenues, 2003, 2010, 2015
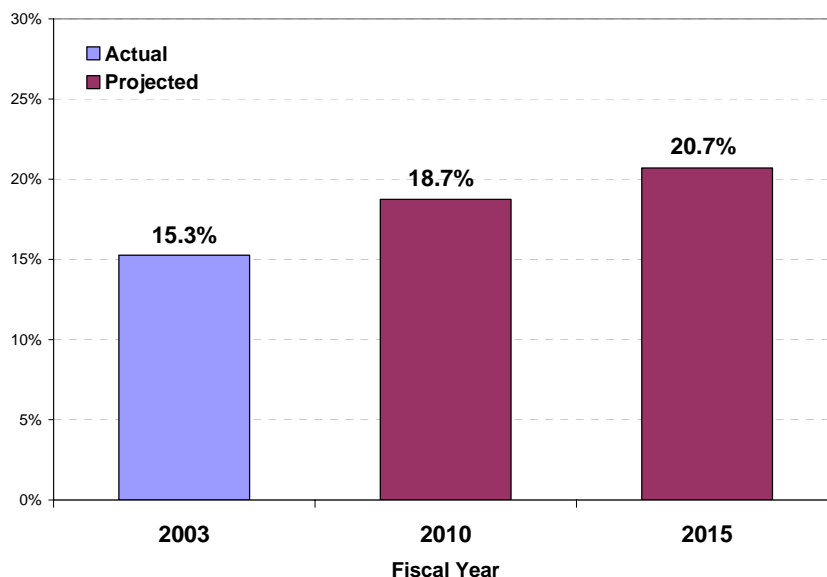
Although we project that Medi-Cal as a share of total General Fund revenues will not grow to anywhere near the levels predicted by some other states, California is already facing significant spending cuts to balance the budget. In this fiscal setting, then, the rising share of

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[20] Of course, the revenue projections are also subject to considerable uncertainty. Stronger economic growth or increases in taxes would lessen Medi-Cal's share of the General Fund, while slower economic growth and declines in taxes would increase its share. For example, if the rate of growth of the General Fund is one percent greater each year than forecast by LAO (averaging 7 percent per year instead of 6 percent per year), then Medi-Cal's share of the General Fund would rise only to 19 percent by 2015 under the baseline forecast. Alternatively, if revenue growth rates average only 5 percent per year, then Medi-Cal's share of the General Fund would grow to 23 percent.

revenues that would be absorbed by Medi-Cal leads to difficult choices on the part of policymakers. State policymakers could reduce expenditures on Medi-Cal by redesigning programs, redirecting funds from other state programs to Medi-Cal, or generating additional General Fund revenues presumably through tax increases. Three additional facts point to how difficult reducing Medi-Cal costs could be: First, the current Medicaid debate at the federal level suggests that a larger share of Medicaid expenditures may be passed on to states, if only through closing loopholes that allow the states to choose the most beneficial accounting practices. Second, both the Administration and the Legislative Analyst's Office estimate that the new Medicare prescription-drug benefit will create net costs for the state over a number of years. Third, the analysis in Chapter 3 suggests that any serious strategies to contain costs for Medi-Cal need to address costs for the high-end enrollees, costs driven by long-term care for the elderly, a broad array of expenses for disabled enrollees, and expensive hospital stays for other enrollees. Strategies that affect marginal spending decisions by the majority of enrollees will have little effect on these high-end costs, which account for most Medi-Cal expenditures.

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Appendix A. Description of Data Sources

Much of the analysis and forecasting performed in this report relies on information derived from the Medi-Cal eligibility and claims files, which consists of MEDS (Medi-Cal Eligibility Data System) and the '35' Paid Claims file. Operating under a data confidentiality agreement with DHS, SPHERE developed analytical research extracts from these data sources to produce data sets summarizing all the health service-related activities captured within Medi-Cal's fee-for-service and Managed Care programs into a per-enrollee per-fiscal year format. These extracts include annual summary measures to encapsulate both the enrollment and service utilization of every enrollee in a fiscal year. This appendix presents in-depth descriptions of the data sources from which these research data sets are constructed, including origins, formats, and contents of both the MEDS eligibility data and '35' Paid Claims file. It concludes with a brief discussion of the processing steps undertaken to create the analytical research data sets, reviewing the various summary measures constructed for the final data sets.

It is important to recognize that our analytical research data sets organize expenditures (costs) by date incurred, whereas the reporting of Medi-Cal expenditures typically gives expenditures by date of payment. Therefore, due to lags in claims submission and processing, reported Medi-Cal expenditures will not be directly comparable to the amounts presented in this report. In our task of constructing long-term forecasts of expenditures, we do not expect these discrepancies to result in meaningful differences in conclusions since both the "incurred" and "paid" measures of expenditures have closely linked growth.

The Consumer Price Index for all urban consumers in the U.S. (CPI-U, CUUR0000SA0), constructed by the Bureau of Labor Statistics, was used to adjust for inflation in results that present expenditures in real terms.

Medi-Cal Eligibility Data System (MEDS) Eligibility Data

The Medi-Cal Eligibility Data System (MEDS) is an online system used to record, verify, and track enrollment in Medi-Cal. Drawing from Klein (2005), Medi-Cal data are processed in the following manner. The system maintains records of individuals enrolled in Medi-Cal in a Virtual Storage Access Method (VSAM) database located at the HHS Data Center. County Welfare Offices interact directly with this system to enter and update information on Medi-Cal enrollees, with the notable exception of enrollees receiving SSI/SSP, for whom the SSA provides information. Information on all enrollees, with the exception of individuals receiving services under Family PACT (aid code 8H) and Presumptive Eligibility (aid codes 7F and 7G), is recorded in the system. MEDS also does not include individuals receiving services from such programs as mental health care (administered by the Department of Mental Health) or dental care. MEDS tracks enrollee records using a unique MEDS ID, which is consistent across eligibility and claims data. For each enrollee record, the system maintains demographic information and a historical account by month of the individual's enrollment in Medi-Cal fee-for-service or Managed Care and related health programs (e.g., Medicare, other health coverage, etc.). People enrolled in both Medi-Cal fee-for-service and managed care during a year are counted in both programs.

To support this project, SPHERE requested and received a series of processed extracts of historical MEDS data covering the period from December 1993 to June 2004 from DHS Medical Care Statistics Section (MCSS). These extracts represent processed versions of the Monthly Medi-Cal Eligibility Files (MMEF) that capture all of the enrollment and partial historical data in the MEDS system at a specific point in time. As described in Klein (2005), the "Departmental algorithm for determining the appropriate Medi-Cal eligibility code was used against the primary, first, etc. special aid codes to derive the correct county and aid code for each month" in the processed MMEF file. For each calendar year SPHERE received a processed version of the June and December MMEF files, each containing historical information for the 12 months prior to creation. Thus, every month appears in two files, as the extracts overlap periods. Due to data-lag issues, mostly related to retroactive eligibility, the two snapshots of a single month do not match exactly.

Concerning the issue of retroactive eligibility, Klein (2005) notes that "a significant percent of all [enrollees] become eligible retroactively, for instance, due to meeting share of cost requirements and late Medi-Cal applications." Thus, a snapshot of the enrollment in Medi-Cal taken at one point in time will likely have different counts than a snapshot taken later. In the data received by SPHERE, comparison of counts of Medi-Cal enrollees by month across files shows that later snapshots of a particular month always indicate higher enrollment counts. As described below, these numbers more closely reflect the reality of enrollment in the program. Thus, we take for each month the latest snapshot available in constructing our analytical research files.

The processed MMEF files were validated after receipt against the counts of monthly Medi-Cal enrollment published by MCSS in the "Medi-Cal Beneficiary Counts Pivot Table." Comparing the latest snapshot of each month, of which we have data lagged by 6-to-12 months, and the MCSS counts, which are based on data lagged by up to 15 months, yielded counts with less than 0.3% difference. This small difference simply reflects the different snapshots from which the counts were calculated.

'35' Paid Claims File

Expenditures incurred on fee-for-service claims are processed using a separate mechanism from enrollment information. Again from Klein (2005), claims for services covered under Medi-Cal fee-for-service are received from providers and processed by a fiscal intermediary (EDS). After adjudicating claims, the FI provides data to the HHS Data Center in a specific file format, commonly termed RFF035 or simply the '35' File. These files are processed again to ensure consistency before being made available for research purposes. These files contain expenditure information for all services covered by traditional Medi-Cal fee-for-service. In addition, fee-for-service claims incurred by enrollees in managed care, termed "carve-outs," are also included. These expenditures are for services covered under Medi-Cal but not included in the capitation rates paid for Managed Care coverage. Like MEDS, the paid-claims files do not include information on dental services or many of the waiver programs in Medi-Cal. Unlike MEDS, however, expenditures by enrollees using services under Family PACT and Presumptive Eligibility are included. Claims for programs that are not recorded in the MEDS data were not considered in this paper. For this project SPHERE received paid

claims files in the '35' File format for all fee-for-service claims processed between January 1993 and October 2004.

Our examination of the contents of a '35' File reveals that claims are organized by the date of final adjudication and payment. Considering that some providers are allowed to submit claims up to 12 months after the service, the amounts paid by Medi-Cal for fee-for-service claims in a given month usually correspond to services provided sometime over the past year. Individual claims are composed of a header followed by a variable number of claim lines. Each claim line represents a particular service, whereas a claim holds a number of claim lines submitted together from a single provider for a single enrollee. In actuality, each claim line is processed separately by the FI, who then repackages the adjudicated lines back into a single claim.

The claim header lists summary information on the lines contained within the claim. Relevant information includes the MEDS ID of the patient, the type of provider performing the services, the time period from which the service was provided, and a summary of the amounts billed to and paid by Medi-Cal benefits. The MEDS ID is unique and consistent across both the '35' File and the MEDS data, a relationship that we exploit later to link information on enrollees between the two data sets. Although not used in our current analysis, the '35' File also contains a wealth of information on the specific services provided to the enrollee on each claim, the health status of the enrollee, and other payers involved in the claim.

Due to separate payments made outside of claims, the reporting of expenditures on claims does not always represent the true amount paid for services. In particular, payments are made directly to hospitals with high Medi-Cal and indigent caseloads as part of the Disproportionate Share Hospital program, and both Federal and State drug rebate programs partially refund expenditures spent by Medi-Cal on pharmaceuticals. Also, some hospitals contract directly with the state to provide inpatient services for Medi-Cal; these payments are recorded as Voluntary Government Transfers. Thus, in interpreting expenditure statistics calculated from claims data one must carefully net out the effects of these large payments (see Appendix B).

To validate these data, the files were initially processed to extract the amounts paid by Medi-Cal from every claim header. While some claims represent adjustments (e.g., voiding previous claims by listing negative paid amounts), summing values for the amount paid by Medi-Cal yields an aggregate sum of expenditures over a given period. Comparing these sums to those published by MCSS in the fee-for-service Expenditures Summary tables reveals only trivial differences.

Creation of the Analytical Research Data Sets

While the MEDS data and '35' Paid Claims files serve as a rich informational source to conduct our analysis, their sheer size and organization make them difficult to use to calculate enrollment and expenditure measures. Below we describe our construction of analytical research data sets that summarize the eligibility, enrollment, and claims data into a per-enrollee per-fiscal year format for the period covering 1997 through 2003. These summary data sets

provide a more convenient and accessible means for investigating activity within the Medi-Cal fee-for-service and Managed Care programs.

As our first step in processing of the MEDS data, we reorganize the MMEF files into data sets containing the most recent data for every month of a given fiscal year. These intermediate data sets resemble the MMEF files in content, and contain the most recent data on every enrollee's aid code, health care plan code, etc., for each month of the fiscal year. Processing is then performed to summarize each enrollee's enrollment history during the fiscal year. In particular, new variables are constructed to count the number of months of Medi-Cal (fee-for-service or Managed Care), Medi-Cal fee-for-service, Medi-Cal Managed Care, Medicare Part A, and Medicare Part B coverage for each enrollee during the fiscal year. Also, a single variable is created to record the individual's predominant aid code – the enrollee's aid code that appears in the most months during any given fiscal year. Finally, to keep the data sets to a manageable size, all monthly variables are dropped, leaving only the demographic characteristics, MEDS ID, and summary measures for each enrollee.

Processing of the '35' Paid Claims files present a larger challenge due to their large size. We processed nearly 500GB of these files to construct our analytical files. The original claims data are organized by date of adjudication/payment. Our analytical data sets are focused on a per-enrollee, per-fiscal year perspective, and therefore the claims must be reordered by date of service. To produce a structure more easily summarizing expenditures, we classify each claim into a service category based upon the vendor code in the claim header. The vendor code describes the provider by type of establishment, closely following in concept the classification scheme used by CMS' National Health Accounts. The claims files are finally summarized into a single record per-enrollee per-fiscal year, where Medi-Cal paid amounts have been summed across all claims for each enrollee into separate variables for each service category. Thus, at the conclusion of this step we have for each fiscal year a single record for every enrollee who incurred claims during the period, where the total amount paid by Medi-Cal has been broken into different service categories.

Finally, we complete the construction of the analytical research data sets by combining processed MEDS data with the summarized paid-claims data. As both intermediate data sets are structured in a per-enrollee, per-fiscal year format, we simply link these two data components using the common MEDS ID. With the resulting data sets, we can directly perform analyses linking expenditures and enrollment in a given fiscal year, without the need to work again with the large unstructured source data. In addition, enrollees who do not match a record in both MEDS and the paid claims, such as many Managed Care enrollees or those receiving Family PACT services, remain in the combined data. Thus, the research data sets serve as an easily accessible and functionally complete resource from which to conduct analyses of Medi-Cal fee-for-service and Managed Care activity in a given fiscal year.

Projection of Enrollees by Age Cohort

Table A.1 presents the projected counts of enrollees by age group used in our analysis, compiled under the assumption of stable enrollment rates by age. Because we hold enrollment rates constant by age group, these enrollment projections directly reflect Department of Finance population projections. Over the forecast period, 2005 – 2015, the Medi-Cal enrollee population

is predicted to grow by 11.25 percent. Elderly enrollees over the age of 65 are projected to have an average annual growth rate of 2.4 percent, which is higher than either the rate for adults ages 18-64 (1.2 percent) or for youth ages 0-17 (0.6 percent). With the elderly representing only 11.4 percent of the enrollee population in 2005, they will account for 24 percent of the growth in the enrollee population over the forecast period. The growth in adult enrollees is projected to peak in 2009 at 1.6 percent annual growth, with this rate falling to 0.7 percent by 2015. In contrast, the growth rates for both the youth and elderly enrollee populations exhibit steadily upward trends, ending at annual values of 0.9 percent and 3.3 percent respectively in 2015.

Table A.1
Population Projections by Age Group, 2005 - 2015

Year	Children	Adults	Elderly	Total
2005	3,603,048	3,263,642	885,540	7,752,229
2006	3,622,374	3,310,753	896,984	7,830,110
2007	3,644,053	3,360,064	909,147	7,913,263
2008	3,660,568	3,410,748	924,601	7,995,918
2009	3,673,336	3,464,280	944,711	8,082,328
2010	3,685,479	3,517,608	965,315	8,168,402
2011	3,702,079	3,564,194	987,455	8,253,728
2012	3,724,503	3,604,363	1,012,645	8,341,512
2013	3,749,604	3,636,418	1,048,585	8,434,607
2014	3,778,500	3,666,188	1,084,844	8,529,533
2015	3,811,064	3,692,648	1,120,926	8,624,638
Average Annual Growth	0.6%	1.2%	2.4%	1.1%

Appendix B. Forecasting Methodology

General Forecast Framework

In this appendix, we discuss our forecasting approach in detail. This section and the other two sections in Appendix B are substantially more technical and may not be of interest to the general reader. This section describes our general analytical framework to forecast future expenditures on Medi-Cal.

As a general modeling framework, the approach we describe here is not specific to California's Medi-Cal program. The same approach could be used more generally for Medicaid expenditure forecasts at the state or federal level. The following sections describe how this framework is applied for the forecasts in this paper. The framework is built around a decomposition of Medi-Cal expenditures across the covered health services and across different enrollee populations. This decomposition allows us to develop formulas to summarize the growth in Medicaid expenditures that account not only for the mix of services and enrollees but also for the cost drivers that will determine the evolution of future expenses. Within this framework, we can incorporate alternative Medi-Cal or Medicaid policy options to examine how policy changes would influence the growth of expenditures overall or across expenditure categories, as described in the final part of this section.

Decomposition into Expenditures by Service and Enrollee Categories

The first task in building the forecast is to characterize the Medi-Cal expenditures by enrollee group and health service category. Table B.1 shows the structure of this decomposition. As in Appendix A, we divide the population of enrollees into different types. In those sections, we focused on enrollees by age group or aid category. However, "enrollee types" could provide a breakdown of enrollees along any particular characteristic or group of characteristics. For example, we could categorize enrollees by demographic characteristics such as age, sex, or race/ethnicity, by economic status such as income relative to poverty or public assistance receipt, or by health-care circumstances. Health-care circumstances could be features such as managed care or fee-for-service or aid category, two examples we used in Appendix A. However, if we had more specific information about health condition (blind/disabled, dialysis patient, etc.), we could also use these characteristics. In completing Table B.1 for a particular forecast, we would list the enrollee types in the rows, with all enrollees assigned to one and only one group. Assuming we divide enrollees into K groups, we identify each group with index k, where $k = 1,…,K$ describes all groups.

The columns in Table B.1 indicate the categories of Medi-Cal services available to enrollees (that is, the services associated with all Medi-Cal claims or expenditures). Such services would include hospital care, physician visits, home health-care services, nursing-home care, prescription drugs and other medical treatment. As with enrollees, each medical procedure or treatment covered by Medi-Cal would be classified into one and only one of the service categories. Assuming we divide services into J categories, the table indexes these service categories by $j = 1,…,J$.

Table B.1
Generalized Breakdown of Expenditures by Enrollee Type and Service Category

Service j / Enrollee k		Service Categories				Total
		1	2	...	J	
Enrollee Type	1	Y_{11}	Y_{12}	...	Y_{1J}	$Y_{1.}$
	2	Y_{21}	Y_{22}	...	Y_{2J}	$Y_{2.}$
	⋮	⋮	⋮	⋮	⋮	⋮
	K	Y_{K1}	Y_{K2}	...	Y_{KJ}	$Y_{K.}$
Total		$Y_{.1}$	$Y_{.2}$	...	$Y_{.J}$	Y

Each "cell" in Table B.1 – identified by the (k, j) pair – reports the dollar amount, Y_{kj}, expended by Medi-Cal on type k enrollees for the services received in category j. The sum for a given row in the table yields

$$\text{(B.1)} \qquad Y_{k.} = \sum_{j=1}^{J} Y_{kj} \ ,$$

the total expenditure by Medicaid on all enrollees in group k. The sum for a column produces

$$\text{(B.2)} \qquad Y_{.j} = \sum_{k=1}^{K} Y_{kj} \ ,$$

which represents the total dollars spent by Medi-Cal on service j across all enrollees. The shares

$$\text{(B.3)} \qquad S_{kj} = Y_{kj} \ / \ Y_{.j} \qquad\qquad W_{kj} = Y_{kj} \ / \ Y_{k.}$$

respectively give the proportion of the Medi-Cal expenditures on services j accounted for by enrollees k (S_{kj}) and the proportion of the Medi-Cal expenditures on enrollees k that paid for services j (W_{kj}). Finally, the sum of the last column and the last row in the table

$$Y \ = \ \sum_{k=1}^{K} Y_{k.} \ = \ \sum_{j=1}^{J} Y_{.j} \ ,$$

represents total Medicaid expenditures on all enrollee types and all service categories. The total Medi-Cal expenditures in a given period t is equivalent to

$$\text{(B.4)} \qquad Y(t) \ = \ \sum_{k=1}^{K} Y_{k.}(t) \ = \ \sum_{j=1}^{J} Y_{.j}(t) \ .$$

In our forecasts, the time index t refers to a fiscal year.

Adding Medi-Cal Cost Drivers

The health policy community often describes the expenditures on services and enrollees appearing in Table B.1 as depending on underlying "cost drivers," factors that ultimately determine the growth in overall costs. As we described in Appendix A, these cost drivers can generally be split into two pieces: enrollment and costs per enrollee. Following this structure, we can incorporate the enrollment and costs per enrollee into the framework of Table B.1 by describing the expenditures on enrollees of type *k* for service *j* as

$$(B.5) \qquad Y_{kj}(t) \ = \ N_k(t) * A_{kj}(t)$$

with

$$(B.6) \qquad A_{kj}(t) = \ P_{kj}(t) \, Q_{kj}(t)$$

where

$N_k(t)$ represents the number of enrollees in group *k* in year *t*,
$A_{kj}(t)$ designates the average annual cost per *k*-type enrollee for service *j*
$P_{kj}(t)$ is the price faced by enrollees *k* for service *j* in year *t*, and
$Q_{kj}(t)$ is the average quantity consumed of this service by these enrollees.

The variables $N_k(t)$ and $A_{kj}(t)$ are notation for the number of enrollees by categories and for costs per enrollee of type *k* in service *j*, a more detailed breakdown of costs per enrollee as in Appendix A. The variables $N_k(t)$, $P_{kj}(t)$, and $Q_{kj}(t)$ can be considered the "cost drivers." The evolution of these variables over time governs how much Medi-Cal expenditures will grow in future years. Because a broad service category such as physician visits or prescription drugs actually represents a basket of goods or services, the price and quantity variables in (B.6) are themselves indexes of individual prices and quantities. Viewing expenditures in this way facilitates the consideration of potential policy levers, which are likely to affect future Medi-Cal expenditures through these broader service categories.

Using lowercase letters to denote the growth rate of the respective uppercase variables, we can now express the growth in Medi-Cal expenditures Y_{kj} in terms of the growth rates in the cost drivers. The relationship between the growth rate in Medi-Cal and the growth rate in the cost drivers are captured in the following equations:

$$(B.7) \qquad y_{kj}(t) = n_{kj}(t) + a_{kj}(t)$$

and

$$(B.8) \qquad a_{kj}(t) \ = \ p_{kj}(t) \ + q_{kj}(t)$$

One calculates the growth rates appearing in (B.7) and (B.8) by applying the familiar approach of taking the natural log of a variable and calculating the time derivative or annual change in log values. According to this definition of growth rates, the link between $Y_{kj}(t)$ and $Y_{kj}(t-1)$ is given by

(B.9) $$Y_{kj}(t) = Y_{kj}(t-1) * y_{kj}(t)$$

where the growth rate $y_{kj}(t)$ also appears in (B.7). Relationships (B.7) and (B.8) provide an accounting of how the expenditure growth rate depends on changes in enrollee population and shifts in average costs per enrollee for a given cell, with the average costs then decomposed further into the growth in prices and quantities.

Formula for Growth Rates in Total Medi-Cal Expenditures

Based on the relationships described above, we now have a structure to compute the growth rates of total expenditures by service categories and groups of enrollees. The implied growth rate for the total cost of service *j*, across all enrollees, is given by

(B.10) $$y_{\cdot j} = \sum_{k=1}^{K} S_{kj}\, y_{kj}.$$

As specified in this formula, the growth in total Medi-Cal expenses for service *j* equals the weighted average of the growth rates in service *j* costs for each of the enrollee groups using this service, where the weights are the shares of total expenditures on service *j* spent on each enrollee type *k*.[21] The counterpart growth rate for the total Medi-Cal budget spent on enrollee group *k*, across all service categories, takes the form

(B.11) $$y_{k\cdot} = \sum_{j=1}^{J} W_{kj}\, y_{kj}.$$

This relationship indicates that the growth in total Medi-Cal expenses for group *k* of enrollees equals the share weighted average of the growth rates in service *j* costs for each category of service. Correspondingly, the total growth in overall Medi-Cal expenditures is

(B.12) $$y = \sum_{j=1}^{J} S_{\cdot j}\, y_{\cdot j} = \sum_{k=1}^{K} W_{k\cdot}\, y_{k\cdot}.$$

where the shares $S_{\cdot j}$ and $W_{k\cdot}$ respectively represent the fraction of Medicaid's budget allocated to service category *j* and to enrollee group *k*.

If we repeatedly apply the formula

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[21] Since each term in equation (B.1) is a function of time, the time derivative is:

$$\frac{\partial Y_{\bullet j}}{\partial t} = \frac{\partial Y_{1j}}{\partial t} + ... + \frac{\partial Y_{Kj}}{\partial t}$$

Dividing through by $Y_{\bullet j}$, and rearranging terms yields:

$$\frac{\partial Y_{\bullet j}}{\partial t}\frac{1}{Y_{\bullet j}} = \frac{Y_{1j}}{Y_{\bullet j}}\frac{\partial Y_{1j}}{\partial t}\frac{1}{Y_{1j}} + ... + \frac{Y_{Kj}}{Y_{\bullet j}}\frac{\partial Y_{Kj}}{\partial t}\frac{1}{Y_{Kj}}$$

which is equation (B.10).

$$Y(t+1) = Y(t) * y(t+1) .$$

we trace out the path of future Medi-Cal expenditures. Starting from reference year t, the projected expenditures in year T equal

(B.13) $$Y(T) = Y(t) * y(t+1) * y(t+2) * ... * y(T) .$$

We can use analogous formulas to project the growth of expenditures for a particular category of services or for a specific group of enrollees.

Role of Policy in Forecasting Framework

The above framework shows several avenues for policy to affect the future growth in Medi-Cal expenditures. Changing Medi-Cal eligibility rules alters the growth in enrollment rates. The change of enrollment rates in turn changes use of heath-care services through the growth rates n_{kj}. Varying the services covered by Medi-Cal, or limiting the amount of a service allowed for reimbursement, influences the future path of Medi-Cal expenses through quantities, expressed in the growth rates q_{kj}. Rationing services through redefinitions of need or restrictions to specific provider networks are other policies that affect expenditures through the quantities. Direct cost controls in the Medi-Cal program act to suppress price growth p_{kj}. Examples of such price controls include group negotiation of drug prices, enrollee premiums, and outright price caps. Cost sharing schemes such as co-pays and share-of-cost programs operate to reduce quantity growth by discouraging use of services and can also lead to decreases in enrollment rates by making Medicaid a less attractive option for eligible families. Finally, the transfer of enrollees from a fee-for-service system into managed care programs can be viewed as shifting enrollees into a different population type, which faces a different cost structure and a separate utilization pattern among service categories. This shift in service provision induces changes in the growth of both quantities and prices.

Any of these policy changes can be incorporated into this framework by changing our assumptions for the growth rates of enrollment (n_{kj}), quantities (q_{kj}) and prices (p_{kj}) which then directly influence future Medi-Cal spending through the formulas (B.10)-(B.13). Forecasting expenditures through this framework systematically accounts for varying growth rates among service categories, as well as providing a correct accounting of differences in the use of services used by the various groups of enrollees making up the Medicaid population.

Forecasting Growth Rates in Per Enrollee Expenditures

To forecast Medi-Cal expenditures, the framework described in Section B.1 requires information on four core items:

- growth rates of average expenditures (a_{kj})
- growth rates of enrollment (n_{kj})
- shares of Medicaid budget spent of various services costs (S_{kj} or W_{kj})
- Initial levels of expenditures (Y).

Among these items, the most challenging to forecast is the average-cost growth rates, a_{kj}. This section takes up this challenge, although, as a simplification, we do not address how the growth in average expenditures decomposes into its price (p_{kj}) and quantity (q_{kj}) components. We first introduce a simplified specification of the relationships from Section B.1 , which provides a basis for calculating the growth in average Medi-Cal expenditures based on national projections for Medicaid costs. The national projections are those developed by CMS (Centers for Medicare and Medicaid Services) for the National Health Expenditure Accounts. In the next section, we use the projections for growth rates in average expenditures to develop trajectories for California's future average expenditures for the different health-care services covered by Medi-Cal. These trajectories finally become the inputs for the forecasts of fee-for-service and managed care expenditures in Medi-Cal to the year 2015.

An important qualification maintained throughout this forecasting analysis concerns the stability of the policy environment over the ten-year horizon. Although we recognize that several significant policy changes are expected in the near future – for instance, the known adoption of Medicare's Part-D prescription drug plan and likely some aspects of Medi-Cal redesign – the baseline projections developed here do not adjust for any such policy changes. These baseline projections are intended to serve as a benchmark case, which over time can be extended to judge the effects of proposed policy changes. Our framework readily allows such adjustments of the baseline to account for anticipated policy changes as specific details of policy proposals become clearer.

Simplified Specification for Average Cost Projections

Using the framework from the first section of this appendix, suppose three age groups make up the enrollee types: children, adults, and aged/elderly cohorts. Our index of enrollee types, *k*, can therefore take values one to three, where one represents the youngest cohort and three represents the oldest. For each age group, divide expenditures into six distinct service categories: hospital care, physician and clinical services, home health, prescription drug, nursing home, and other services. Our index of service categories, *j*, then ranges from one to six, and each cell in Table B.1 lists the annual Medi-Cal costs for a given service used by a specific age cohort.

Our baseline forecasts for Medi-Cal expenditures rely on two key assumptions:

(A) Within a service category, growth rates of average expenditures are constant across all cohorts within a year. This implies: $a_{1j}(t) = a_{2j}(t) = a_{3j}(t) = a_j(t)$ for each *t*, where $a_j(t)$ denotes the growth in the average costs of Medi-Cal service *j* in year *t*.

(B) Medi-Cal enrollment rates remain constant over the projection period for each age group. This assumption implies: $n_{k1}(t) = n_{k2}(t) = n_{kJ}(t) = n_k(t)$, where $n_k(t)$ corresponds to the year-*t* growth rate in the size of age group *k* in the overall population.

It is important to recognize that neither (A) nor (B) presume any information about the levels of the averages A_{kj} or the levels of the sizes of the enrollee groups N_{kj}. These assumptions merely restrict the way in which these levels grow over the projection horizon.

Using equations (B.7) and (B.10), assumptions (A) and (B) imply that average growth rates $a_j(t)$ are determined by the relationship

$$(B.14) \qquad a_j(t) = y_{\cdot j}(t) - \sum_{k=1}^{K} S_{kj}(t) \, n_k(t) \, .$$

This simplified specification allows us to draw on published projections for $y_{\bullet j}(t)$. As detailed below, CMS publishes ten-year projections of National Medicaid expenditures by service categories, equivalent to $y_{\bullet j}(t)$. CMS also publishes data on the Medicaid expenditure shares, which permits calculation of $S_{kj}(t)$. Finally, the California Department of Finance publishes forecasts of population growth by age group, which projects $n_k(t)$. Inserting this information into (B.14) provides a formula for computing projections for the growth in average expenditure growth, $a_j(t)$. By construction, these rates capture growth in average costs adjusted for the age-cohort influences in the national Medicaid population on Medicaid spending patterns.

National Data Sources for Growth-Rate Forecasts

As the primary administrator of national health programs, CMS provides a number of data and statistical products designed to measure and track health-care usage patterns, expenditures, and financing. These National Health Accounts include a ten-year projection of the country's health expenditures presented by service category and source of funding (private health insurance, out-of-pocket, Medicare, Medicaid, etc.). The most recent annual release of these data was made available in early 2004 and provides estimates from the base of calendar year 2002 through calendar year 2013.[22] The projections are produced by the Office of the Actuary based on historical NHE (National Health Expenditure) data through 2002 and their own econometric model that uses assumptions consistent with those made for Medicare and Medicaid projections. However, the current release does not include effects of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA).

In addition to the historical and projected NHE data, we also use two other national-level data sources in our calculations. First, we use information from the Medicaid Statistical Information System (MSIS), which collects eligibility and claims data from state Medicaid administrations. The most recent complete MSIS annual report is 2000. Because MSIS collects both eligibility and claims information, it allows us to associate service category expenditures to specific age cohorts – a relationship we need to derive the cohort expenditure shares. Finally, we use U.S. Census population projections and estimates to derive future cohort growth rates.

Forecasted Growth Rates Implied by NHE Projections

To compute projected values for the growth rates in average costs ($a_j(t)$) for Medicaid services using formula (B.14), we insert annual expenditure growth rates ($y_{\bullet j}(t)$) for each service category in the relevant year from the NHE projections of national Medicaid spending. We take expenditure shares S_{kj} in this formula from the 2000 MSIS data. In our forecasts of the national values, we presume these shares remain stable during the projection horizon. Finally,

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[22] Our ten year forecast requires growth-rate forecasts through 2015. Because the 2005 edition of NHE has not yet been released, we projected the growth rates from 2014 forward by assuming that the rates followed a linear trend.

we incorporate US Census projections for size of future age cohorts as our forecasts for the growth in eligible-age groups ($n_j(t)$).

Figure B.1 shows the resulting projections for the growth rates of average-cost per enrollee for each Medicaid service category. The starting point in this figure is the NHE projection base year (e.g. 2003). In this period, the highest growth rates were exhibited by Other-Services, and Prescription Drugs, which grew at annual rates of 16 percent and 14.3 percent, respectively. Costs in Physician (11.5 percent), Hospital (10.1 percent), and Home-

Figure B.1
Projected Growth Rate of Average Cost per Enrollee by Medicaid Service Categories, 2003 to 2015
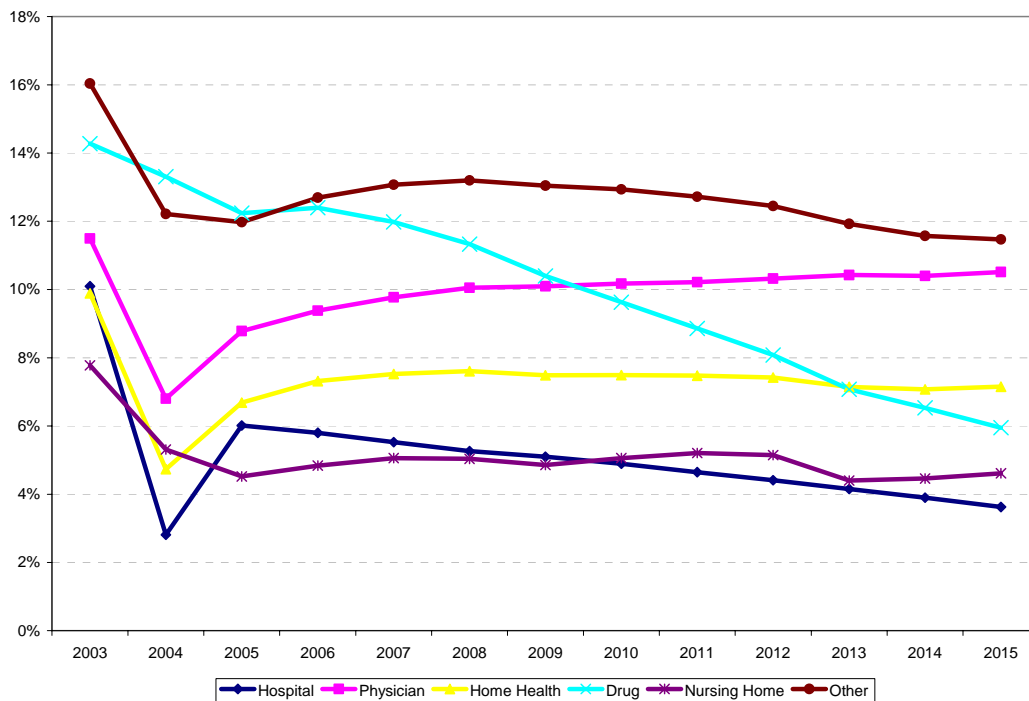
Health (9.9 percent) services were the next three fastest growing items, while the slowest growing category was Nursing Home services at 7.8 percent.

According to the CMS projections, most of the NHE growth rates were projected to dip substantially in 2004 and then increase slowly over the medium-term (5-year) horizon. This drop may be an artifact in the data due to the fact that the 2004 growth rates span historical and projected data.[23] Setting aside this unusual dip, most of the rates slowly increase over the rest of the medium-term horizon, with the exception of Prescription drugs and Hospital costs, whose behavior exhibits declining growth rates starting in 2005.

In the out-years from 2009 through 2015, all growth rates are projected to fall gradually, with the single exception of Physician-services which increases from 10.1 percent in 2009 to 10.5 percent at the end of the forecast horizon. By 2015, the costs in the Other-services category (11.5

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[23] The decline in Medicaid cost growth is also noted by Holahan and Ghosh (2005).

percent) are still the fastest growers followed closely by Physician-services (10.5 percent). Home-health falls slightly from 2009 to 7.2 percent. The two slowest growing service-category costs are still Nursing Home (4.6 percent) and Hospital (3.5 percent). Finally, the most notable change in the figures is the decline of the Prescription Drug costs, which are projected to fall to only 6 percent annual growth.

Comparison of NHE and California Growth Rates

Using historical Medi-Cal and demographic data for 1997 through 2003, one can calculate a similar set of service-category growth rates for California's Medicaid program. In particular, using the fee-for-service Medi-Cal claims data, we grouped expenditures into the same six service categories utilized in the NHE data. These data provide for the direct calculation of the expenditure growth rates, $y_{\bullet j}$, for aggregate service categories, as well as the expenditure shares, S_{kj}. Use of the Medi-Cal MEDS enrollment data provides for the direct computation of the growth rates in enrollee populations by age groups n_k. Plugging these values into formula (B.14) produces values for California's average-cost growth rates a_j.

Figures B.2-B.7 compare the national and California growth rates for average costs for each of the six Medicaid service categories. To extend the period of overlap in measuring values, we expand our imputation of national rates exploiting NHE historical data. The most prominent feature of these figures is the choppiness exhibited by the California growth rates. The only category showing a consistently positive growth rate is Prescription Drug, which averaged between 10 percent to 15 percent annual growth. The remaining categories fluctuate to a high degree, and all display at least one or two years of negative (e.g., falling) average costs. The historical NHE-derived rates also show a high variance but not nearly as high as California's values.

Focusing on 2003 – the most recently available historical observation – one sees some similarities in the ordering of the service-category growth rates. For both the nation and California, the two fastest growing average costs include the service categories of Prescription Drugs and Other-Services. The second two fastest growing services consist of Physician and Hospital Care. Finally, the slowest growing categories for both include Home Health and Nursing Home services. So while the patterns in growth rates in average costs differ between California and the nation, the ranking of service categories by growth rates generally agrees between the two.

In our baseline projections that assume no change in policies, it is hard to justify how growth rates in California could be substantially different from those in the rest of the nation. The volatility of the California growth rates of the past makes them inappropriate as a basis for projecting future growth rates. In some cases, programmatic changes are a more important determinant of past growth rates than any underlying cost inflation. Indeed, program expansions in California can at least partly explain lower growth rates in the past. Expansions that add lower-cost users will depress per-enrollee costs. Finally, to the extent that California has held growth rates artificially low, the state could be vulnerable to even greater future increases.
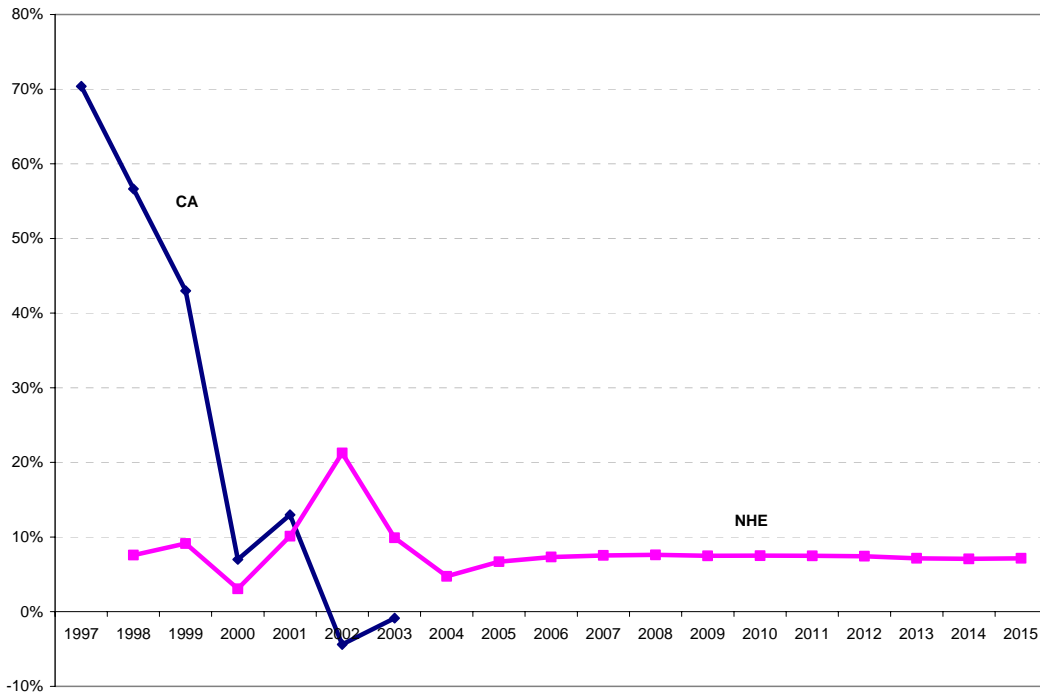
Figure B.2
Growth Rate of Average Hospital Cost per Enrollee,
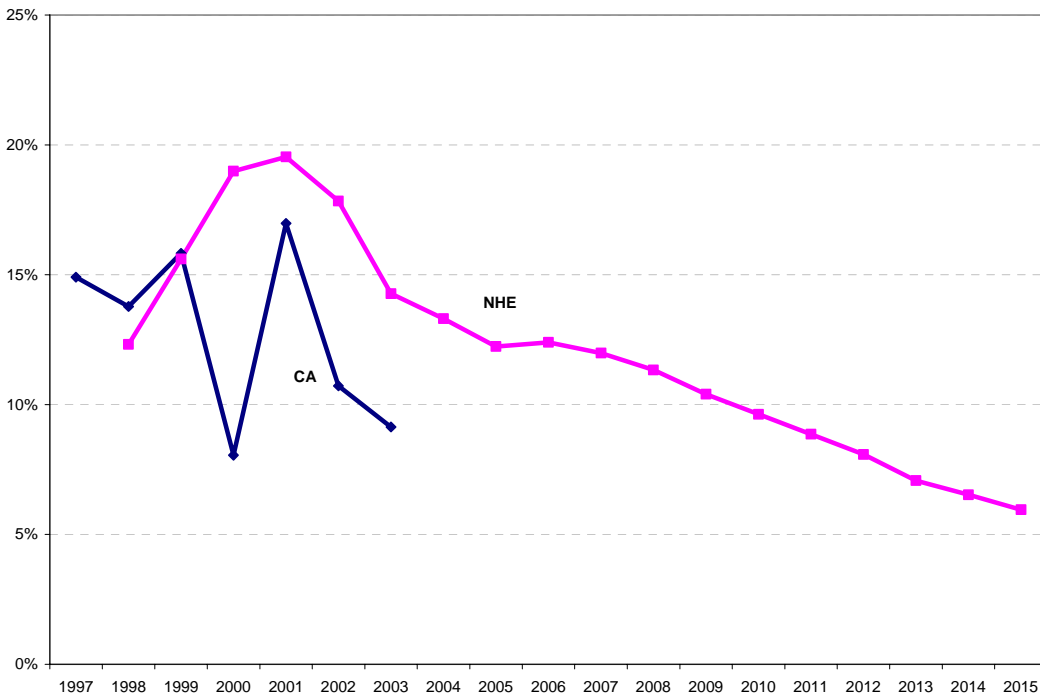**California Actual and NHE Actual and Projected, 1997 to 2015**
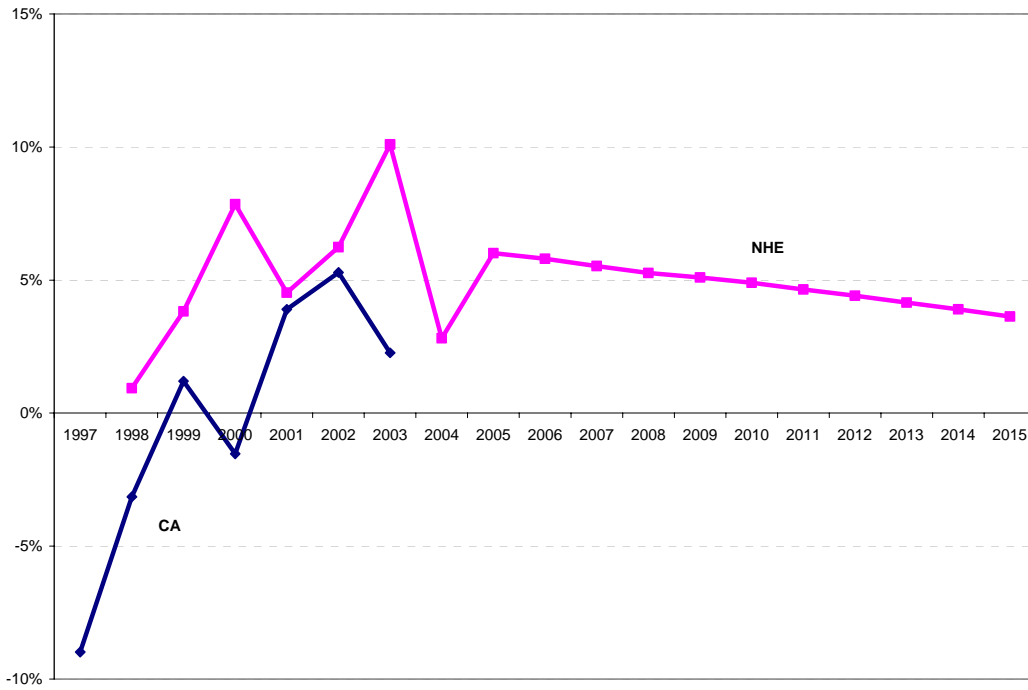
Figure B.3
Growth Rate of Average Physician Cost per Enrollee,
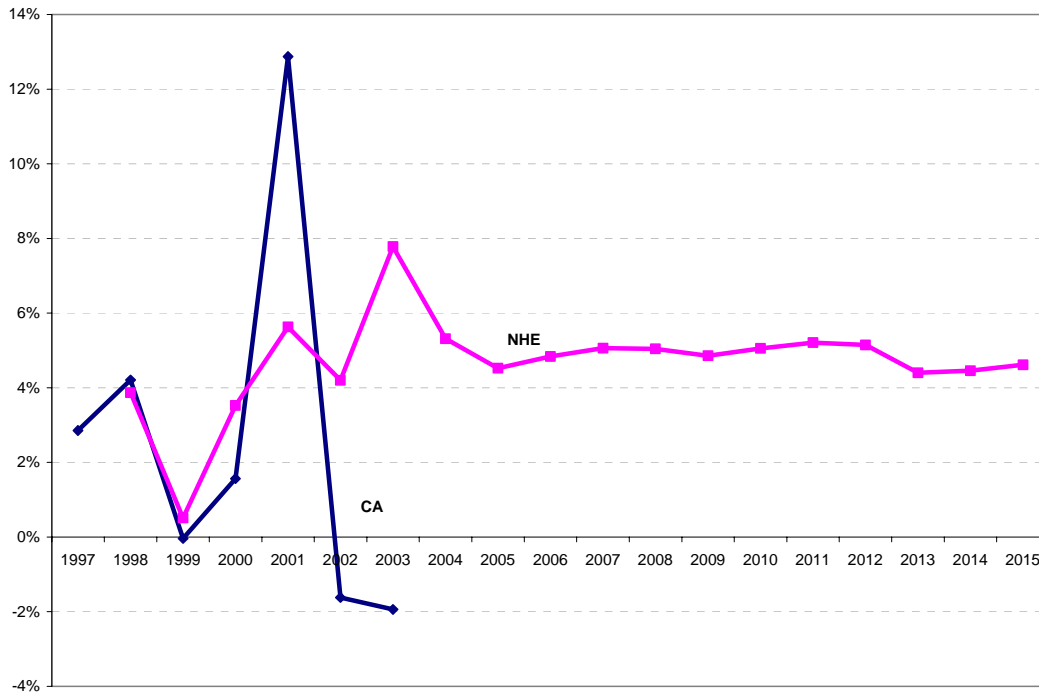**California Actual and NHE Actual and Projected, 1997 to 2015**
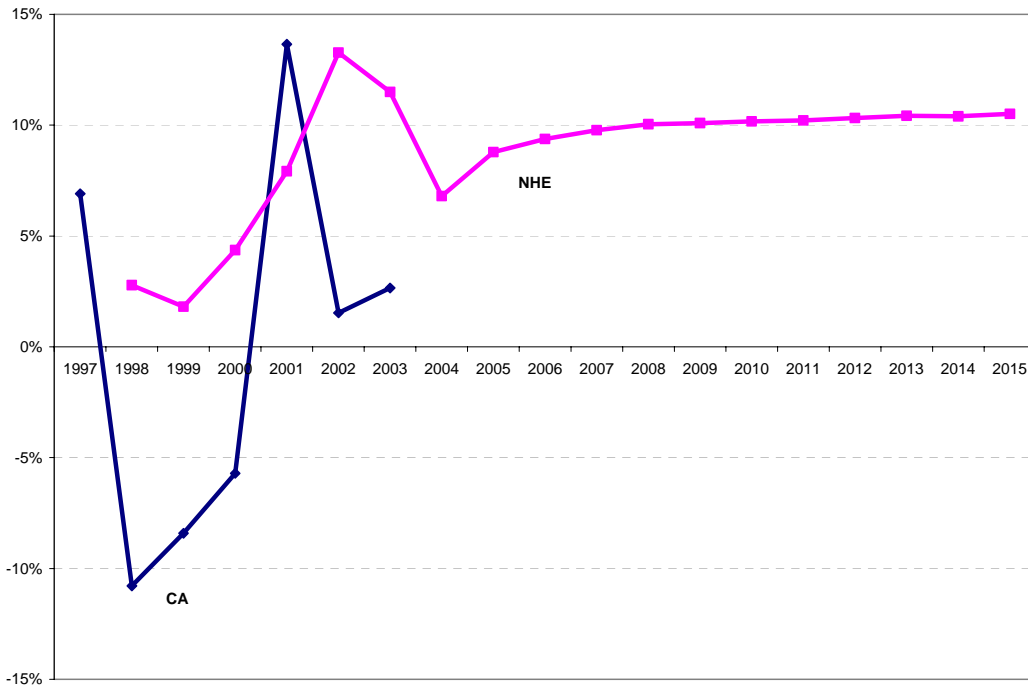
Figure B.4
Growth Rate of Average Home Health Cost per Enrollee,
**California Actual and NHE Actual and Projected, 1997 to 2015**

Figure B.5
Growth Rate of Average Prescription Drug Cost per Enrollee,
California Actual and NHE Actual and Projected, 1997 to 2015

Figure B.6
Growth Rate of Average Nursing Home Cost per Enrollee,
California Actual and NHE Actual and Projected, 1997 to 2015

Figure B.7
Growth Rate of Average Other Fee-for-Service Costs per Enrollee,
California Actual and NHE Actual and Projected, 1997 to 2015
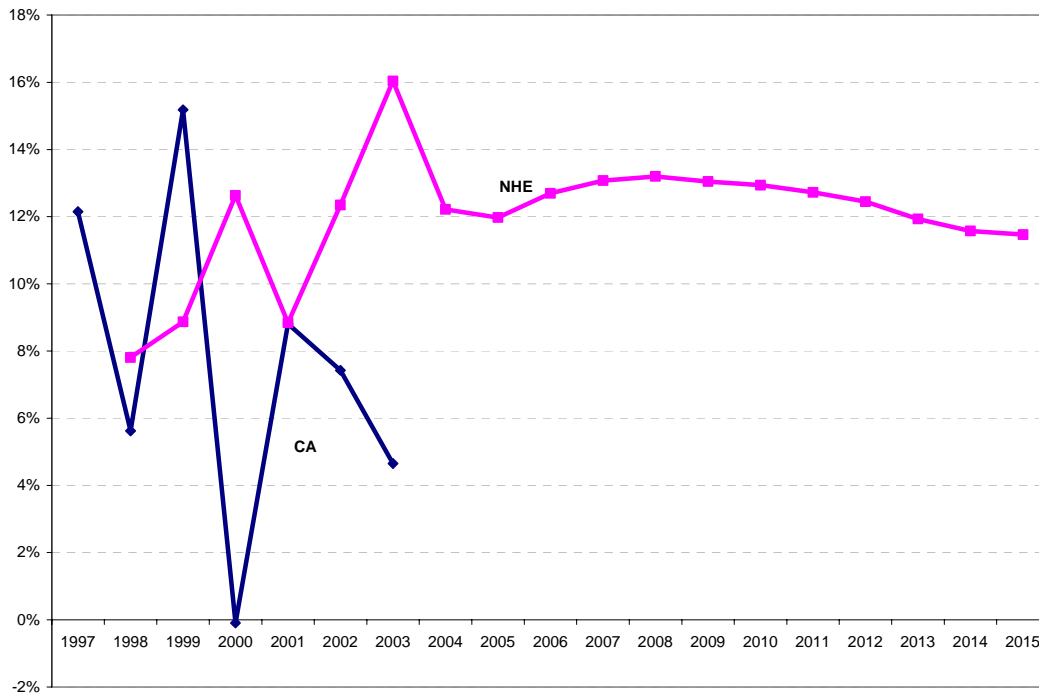
Baseline Forecasts for Medi-Cal Expenditures

The national projections of the growth in average costs of various Medicaid services through 2015 provide one key set of inputs for the baseline projections of Medi-Cal expenditures, but these represent only the first of the four elements we need to complete our forecasts. This section fills in these missing elements and constructs baseline forecasts for total Medi-Cal expenditures in its fee-for-service (FFS) and Managed Care programs.

The following discussion begins with an overview of the remaining steps required to construct a forecast of Medi-Cal fee-for-service expenditures. We then present details of the fee-for-service baseline projection, covering specific issues encountered in performing the projection steps and analyzing the forecasts to determine the trends most important in contributing to expenditure growth. We next present baseline projections of Managed Care expenditures by the Medi-Cal program, including addressing adaptations necessary to accommodate the data limitations present in Managed Care. Finally, we combine these two projections to formulate forecasts for total Medi-Cal spending for health-care benefits.

Overview of Medi-Cal Forecasting Approach

To reiterate the four core items needed as inputs in our modeling framework, we need to forecast:

- growth rates of average expenditures (a_{kj})
- growth rates of enrollment (n_{kj})
- shares of Medicaid budget spent of various services costs (S_{kj} or W_{kj})
- initial levels of expenditures (Y).

The following six steps comprise our approach for constructing predictions of these items:

(1) Forecast average expenditure growth rates $a_j(t)$ for 10-year horizon.

Our baseline projections for Medi-Cal rely on the values of $a_j(t)$ evaluated at the national projections through 2015 developed in Section B.2. As noted in this previous section, our analysis maintains that growth rates of average expenditures are constant within a service category across all cohorts within a year, implying $a_{kj}(t) = a_j(t)$ for every *k* at a given t. Setting the $a_j(t)$'s at these national values is a natural choice for a baseline case since virtually any forecasts of Medi-Cal expenditures would be compared to the Medicaid projections reported by CMS for the National Health Accounts. Our analysis framework readily permits different assumptions regarding the way Medi-Cal average cost growth rates behave relative to the national rates, but for this baseline case we presume that average growth rates in Medi-Cal service categories match projected CMS/NHE rates.

(2) Forecast enrollment population growth $n_k(t)$ for 10-year horizon.

Consistent with the previous section and our assumption of stable Medi-Cal policies, this analysis maintains that Med-Cal enrollment rates remain constant over the projection

period for each age group. This implies that growth rates in enrollee age cohorts become $n_{k1}(t) = n_{k2}(t) = n_{kJ}(t) = n_k(t)$ where $n_k(t)$ corresponds to the year-t growth rate in the size of age group k in California's overall population. We derive the year-to-year growth rates $n_k(t)$ for all age categories from projections of the statewide population over our 10-year horizon. The computed enrollment growth rates apply to both the fee-for-service and Managed Care programs of Medi-Cal presuming stability in participation in these programs. Appendix A presents our projections of these enrollment levels, including a discussion of the growth of each age group.

(3) Calculate expenditure shares S_{kj} for every forecast year.

Once again relying on the assumption of a stable policy environment, our analysis presumes that expenditure shares do not change over time, abstracting from shifts directly implied by projections of our model. Thus, we need information only on the share S_{kj} in the year prior to the first year of the forecast. For fee-for-service, the processed Medi-Cal eligibility and claims data offer a rich source of information on both enrollees and expenditures from which one can calculate these shares directly for the base year.[24] Unfortunately, comparable claim-level encounter data are not available in Managed Care, making it impossible to obtain these values directly. Thus, instead, we impute the underlying distribution of service utilization between service categories and age groups relevant for Managed Care to infer values for shares S_{kj}. We discuss this inference problem further below when we turn explicitly to the Managed Care forecast.

(4) Calculate aggregate expenditure growth rates $y_{kj}(t)$ from forecasted components.

Using the inputs constructed in the previous steps, we calculate the expenditure growth rates $y_{kj}(t)$ and $y_{.j}(t)$ for each Medi-Cal service j for each forecast year exploiting equations (B.7), (B.10) and (B.12).

(5) Obtain starting levels $Y_{.kj}$ for base year of the projection horizon.

As with setting values of expenditure shares in Step 3, we calculate starting expenditure levels for each service category for each cohort in fee-for-service for the base year directly from the Medi-Cal eligibility and claims data. Because claims-level data are not available for managed care, we encounter the same problem in directly obtaining Y_{kj} values as we encountered in calculating shares. However, we do have data on the total level of expenditures (Y) for managed care across all service categories and age groups from published budget information. We use this information to infer starting levels for the Y_{kj}'s in Managed Care by applying the distribution of expenditures by service category imputed in Step 3. For both fee-for-service and Managed Care, we adjust the resulting starting levels to account for direct payments to hospitals and rebates for pharmaceutical expenses.

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[24] See Appendix A for additional details of the Medi-Cal MEDS eligibility and '35' Paid Claims File referenced in this discussion.

(6) Calculate projected expenditure levels for 10-year horizon.

Combining the growth rates $y_{kj}(t)$ and $y_{.j}(t)$ calculated in Step 4 and the starting levels Y_{kj} and $Y_{.j}$ computed in Step 5 for each forecast year, we apply equations (B.9) and (B.13) to obtain projected expenditures by service category for the various age cohorts out until the year 2015.

Following these steps separately for fee-for-service and Managed Care, we obtain forecasts for expenditure levels Y_{kj} by service categories and age groups for both programs. Aggregating these forecasts Y_{kj} across service categories and/or enrollee types creates projections for total program spending or for expenditures on packages of services or on enrollee populations. Combining projected expenditures for these two programs yields forecasts for overall Medi-Cal spending. Below, we discuss the application of the above six steps in creating the fee-for-service and Managed Care baseline projections.

Projecting Fee-for-Service Medi-Cal Expenditures

Proceeding through the steps detailed above provides a straightforward mechanism for constructing baseline forecasts for the Medi-Cal fee-for-service program. Step 1 takes the values for $a_j(t)$ obtained in the previous section. Step 2 calculates the growth rates $n_k(t)$ for each age cohort using the Department of Finance population projections for each forecast year. (Appendix A presents the results of this intermediate step as actual enrollment counts.) To carry out Steps 3 and 5, we process Medi-Cal eligibility and claims data and aggregate the fee-for-service expenditures incurred in the base year by ages of enrollees and by service category of claims. These processed data provide the information necessary to construct the shares S_{kj}. With the input of previous steps, application of Step 4 yields values for the expenditure growth rates $y_{kj}(t)$. To obtain starting levels Y_{kj} for the base year in Step 5, we again return to the processed Medi-Cal data, now aggregating fee-for-service expenditures incurred by service category of claim for each age cohort. Before continuing, we incorporate an adjustment to these values to account for payments and rebates not reflected in the claims data. This includes direct payments to hospitals and drug rebates received by the state, as recorded in the Local Assistance Estimates published by DHS. Finally, in Step 6 we project expenditures levels $Y_{kj}(t)$ for every forecast year and, in turn, sum these quantities to compute the aggregates $Y_{.j}(t)$, $Y_{k.}(t)$ and $Y(t)$.

To identify the expenditures associated with enrollees in blind/disabled aid types in the projections (as presented in Section 4), we calculate the share of expenditures within each age group and service category of blind /disabled enrollees in the base year from the Medi-Cal eligibility and claims data. We then apply these shares to each projected $Y_{kj}(t)$ to determine the expenditures attributable to this aid group.

Baseline Fee-For-Service Expenditure Projections

Table B.2 displays the resulting baseline forecast for aggregate Medi-Cal fee-for-service expenditures. Overall, this forecast shows a strong trend of steady increases due to the consistently high growth in the average cost per enrollee. Nominal expenditures more than

double from $18.5 billion in 2005 to $42.7 billion ten years later, implying an annualized expenditure growth of 8.7 percent per year over the 2005 to 2015 horizon.

Table B.2
Baseline Forecast of Fee-For-Service Medi-Cal Expenditures, 2009-2015
(Millions, Nominal)

Fiscal Year	Projected FFS Expenditures
2009	$26,324
2010	$28,694
2011	$31,206
2012	$33,864
2013	$36,667
2014	$39,615
2015	$42,717
Average Annual Growth 2005-2015	8.72%

Figures B.8 and B.9 graph projected total expenditures broken down by service categories and age cohorts, offering two perspectives from which to view the final baseline forecast. Notably, there is only slight differential growth in expenditures between different age categories; expenditures for elderly enrollees rise at a slightly higher average annual rate (9 percent) than for either adults (8.6 percent) or youth (8.5 percent), but, overall, we see that expenditure shares by age groups shift by no more than a single percentage point during the forecast period. Thus, on the whole, fee-for-service expenditures are not strongly driven by disproportionate growth among age categories of enrollees.

There are, however, strong trends in underlying costs revealed when we examine the differential growth between service categories. Examining expenditure growth by service categories between 2005 and 2015, the two largest contributors include Hospital Care and Pharmacy spending, comprising 24.3 percent and 28.3 percent of total growth, respectively. Hospital Care remains the largest service category, growing in nominal value from $7.4 billion in 2005 to $13.3 billion in 2015 implying an annual growth rate of 6 percent. While Pharmacy spending remains lower at a projected $10.7 billion in 2015, it shows much higher average annual growth of 11 percent, rising in share from 20.6 percent of total expenditures in 2005 to 25 percent in 2015. Note, however, that the Prescription Drug growth rates start high in 2005 (13.4 percent) but gradually drop to 7.7 percent in 2015; this behavior arises due to an implicit trend in the NHE data attributable to effects of a slower rate of new drug introductions and the end of patent protection for some popular drugs.[25]
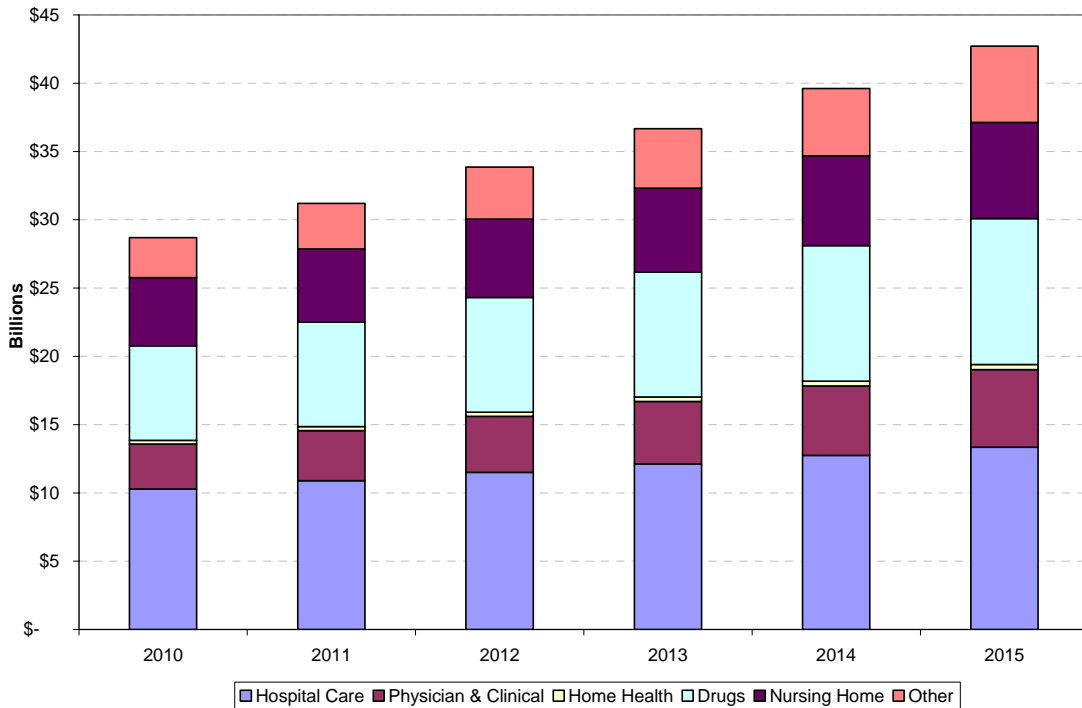
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[25] Heffler et. al. (2004).

Figure B.8
Total Projected Medi-Cal Fee-for-Service Expenditures by Age Group, 2010-2015
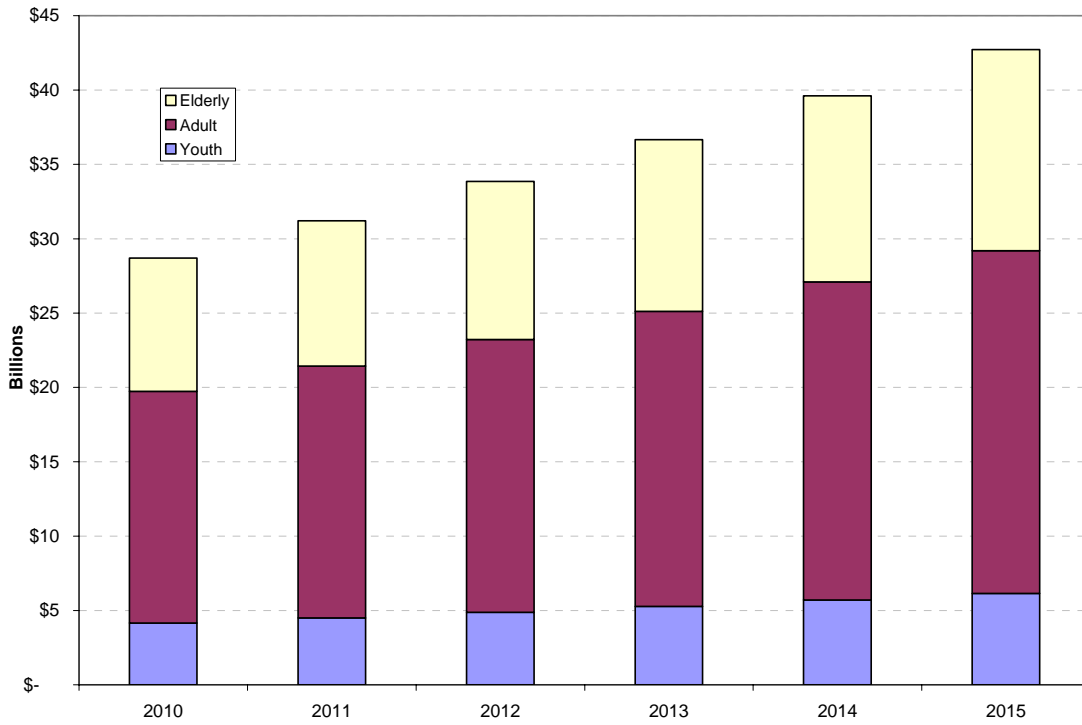
Figure B.9
Total Projected Medi-Cal Fee-for-Service Expenditures by Service Category, 2010-2015

The service categories of Other and Physician and Clinical show high average annual growth rates of 14.1 percent and 11.4 percent, respectively. Due to these relatively high rates, these two categories account for a combined 26.4 percent of total fee-for-service expenditures in 2015, up from 18.5 percent in 2005. In contrast, the relatively slower-growing service category of Nursing Home Care exhibits an average annual expenditure growth rate of 6.9 percent. Overall, the baseline forecast reveals a strong trend where growth rates are higher for Pharmacy, Other, and Physician and Clinical expenditures than for Hospital and Nursing Home Care expenditures.

Projecting Medi-Cal Managed Care Expenditures

We now turn to producing a baseline projection for Managed Care expenditures, once again utilizing the steps detailed above. Steps 1 and 2 are identical to our fee-for-service calculations, as there are no functional differences between the two programs with respect to the average expenditure growth per service category $a_j(t)$ and the state enrollee-population growth rates $n_k(t)$.

In carrying out Step 3, we face formidable data limitations in computing expenditure shares S_{kj}. As Managed Care is a capitated program, we do not have representative encounter information, and thus service utilization, on enrollees covered by Managed Care. To overcome this problem, we exploit the fact that most capitation rates, in following HCFA guidelines, are ultimately based on expenditure benchmarks that are fee-for-service equivalent.[26] The growth in expenditures in both fee-for-service and Managed Care is driven by similar forces – changes in the eligible populations, health-care utilization, and medical-care prices. Consequently, we assume that the distribution of expenditures by enrollee types and service categories in the Managed Care system mimics that of an equivalent population of enrollees covered by fee-for-service, with the caveat that adjustments may be made to ensure comparable service coverage between the two programs. To the extent that fee-for-service enrollees (even after adjusting for age group and aid type distributions and service coverage as described below) are not representative of managed care enrollees, our estimates will be biased. For example, fee-for-service could show higher utilization as individuals sometimes enroll in fee-for-service when they have a medical need and then move to managed care after six months (or more).

A major task, then, in completing Step 3 (i.e., imputing shares S_{kj}) for the Managed Care Medi-Cal population is building distributions for the expenditures of a fee-for-service covered population that is equivalent to the one served by Managed Care. Recognizing that service utilization varies by both the aid type and age of enrollees, we assume that enrollees may differ across aid-code age-cohort group, but within these groups, Managed Care and fee-for-service enrollees have similar behavior. [27] Accordingly, we assume that average expenditures for Managed Care participants would be proportional to the averages for fee-for-service participants with the same characteristics, where factors of proportionality are common across service categories within an aid-code age-cohort group. From the eligibility and claims data we can compute the average expenditures per fee-for-service eligible for all aid-code and age-

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[26] The federal government, however, could require states to use encounter data where available.

[27] In this context, "aid code" refers to the primary aid code covering the majority of months for the eligible during the year.

cohort groupings for the base year. Applying our proportionality relationships to the entire population of Managed Care enrollees during the base year provides for the imputation of a FFS-equivalent distribution of expenditures for service categories associated with those enrollee groups making up the Medi-Cal Managed Care population.

This strategy produces a bias arising in the estimates of the Managed-Care expenditure distributions, because there are a variety of services not covered under many of the Medi-Cal Managed Care plans that are covered in the fee-for-service system. These "carve out" services are not paid for by capitation rates; instead they are primarily provided to Managed Care enrollees directly through the fee-for-service program. To account for this factor, we use the processed claims data to subtract the fee-for-service costs attributed to Managed Care enrollees from the relevant parts of our constructed FFS-equivalent expenditure distributions. This adjustment improves the estimate of the cost of services paid for by Managed Care programs and utilized by its participants. We calculate the expenditure shares S_{kj} for the Managed Care enrollee groups from these adjusted distributions, which completes Step 3.

Given the inputs from Steps 1-3 for the Managed Care population, execution of Step 4 to generate expenditure growth rates $y_{\cdot j}(t)$ for segments of this enrollee population mirrors the fee-for-service case. This exercise yields expenditure growth rates for each of the service categories covered by the Managed Care capitation fees.

Step 5 is again affected by the lack of information on the levels of expenditures across service categories within managed care, making direct calculation of the starting values Y_{kj} impossible. Fortunately, our expenditure distributions imputed for FFS-equivalent populations in Step 3 allows for calculation of the share of total Managed Care expenditures going to each service category. Applying these shares to the level of Managed Care expenditures reported in the base year provides for direct inference of $Y_{\cdot j}$ for each of the medical services.

With both the growth rates $y_{\cdot j}(t)$ and the starting levels $Y_{\cdot j}$ in hand, Step 6 produces forecasts for the aggregate expenditure amounts $Y_{\cdot j}(t)$ for each service j applicable for the Managed Care program of Medi-Cal. Applying the shares S_{kj} calculated in Step 3, we translate the amounts in each forecast year into expenditures by enrollee type (e.g. age cohort) and by service category, yielding projections of $Y_{kj}(t)$ as output. We then aggregate these results to obtain both aggregate service-category expenditures $Y_{\cdot j}(t)$ and age-cohort expenditures $Y_{k\cdot}(t)$. These aggregate values can, in turn, be summed to form final forecasts for $Y(t)$ for every year in the projection horizon.

Baseline Managed Care Expenditure Projections

Table B.3 presents the resulting forecast for total Medi-Cal expenditures for Managed Care. As the same forces ultimately govern growth in both fee-for-service and Managed Care costs, it is not surprising to see that predicted expenditures grow steadily over the forecast horizon. Nominal expenditures roughly double from $5.9 billion in 2005 to $12.8 billion in 2015. This corresponds to an 8.1 percent annual growth rate, slightly lower than the 8.7 percent growth rate recorded by the fee-for-service expenditures. This difference primarily reflects the different bundle of services used by Managed Care versus fee-for-service enrollees, a topic discussed further below.

Table B.3

Baseline Forecast of Managed Medi-Cal Expenditures, 2009-2015
(Millions, Nominal)

| Fiscal Year	Projected FFS Expenditures
2009	$8,190
2010	$8,875
2011	$9,594
2012	$10,350
2013	$11,133
2014	$11,953
2015	$12,812
Average Annual Growth 2005-2015	8.12%

Figures B.10 and B.11 graph projected total expenditures separated into age groups and service categories, providing two perspectives to help interpret the overall baseline forecast for Managed Care spending. Figure B.10 indicates that expenditure growth for Managed Care age cohorts mostly tracks that seen in the fee-for-service population, with expenditures for elderly enrollees rising at a slightly higher average annual rate of 8.8 percent than for either adults (8.1 percent) or children (7.82 percent). Elderly enrollees make up only 12.5 percent of total expenditures in 2005, whereas they constitute 31 percent of total expenditures in fee-for-service. This smaller concentration of elderly slows the projected costs of Managed Care expenditures relative to its fee-for-service counterpart.

As with the fee-for-service projection, most of the expenditure growth in Managed Care comes about due to particular high-growth service categories. Overall, Hospital Care contributes the largest component to growth, accounting for 34.8 percent of the overall expenditure rise. This occurs even though this service experiences a relatively low average 5.8 percent annual growth from 2005 to 2015. The large contribution of growth attributable to Hospital Care follows directly from its starting 54.6 percent share of expenditures in 2005. Compared to fee-for-service (40.3 percent), this represents a considerably higher share of starting expenditures in the relatively slower growing service category of Hospital Care. Also, as found in the fee-for-service projections, the average annual growth rates for Other, Physician, and Drugs services are relatively high compared to other service categories, experiencing average annual growth rates of 13.9 percent, 11.2 percent, and 10.6 percent, respectively. In contrast, Home Health, Nursing Home Care, and Hospital Care show growth at average rates of 8 percent, 6.7 percent, and 5.8 percent, respectively. Thus, the service categories of Physician Care and Other grow disproportionately, rising from 19.5 percent of expenditures in 2005 to 27.5 percent in 2015. Similar to the fee-for-service baseline projections, our forecasts indicate growth in Pharmacy, Other, and Physician and Clinical expenditures as gaining in importance, while Hospital Care,

Total Projected Medi-Cal Managed Care Expenditures by Age Group, 2010-2015
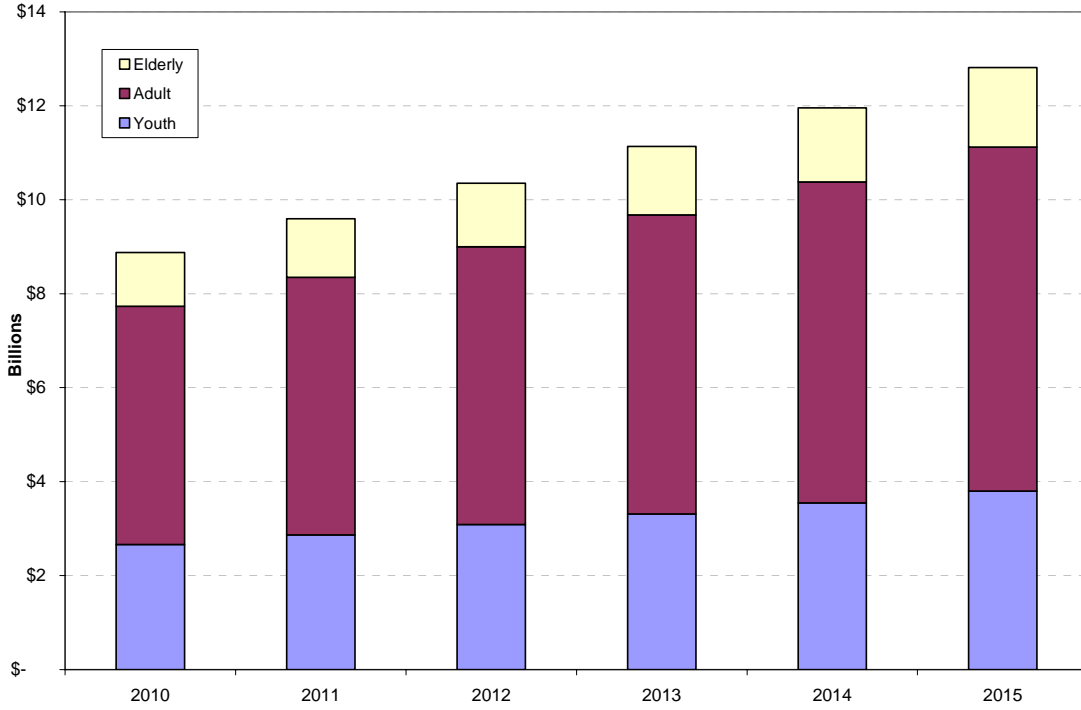
Figure B.11
Total Projected Medi-Cal Managed Care Expenditures by Service Category, 2010-2015
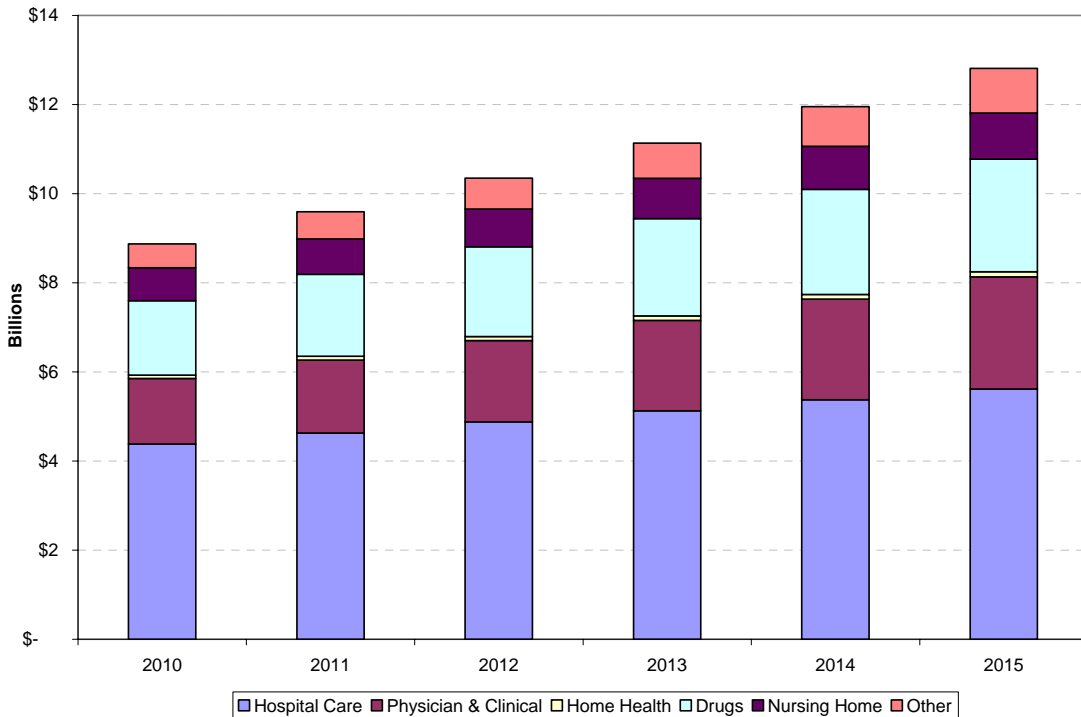
though still dominant, steadily loses expenditure share throughout the forecast horizon. Consequently, not only does Managed Care spending grow at a somewhat lower rate than fee-for-service due to the composition of its enrollee population, it also rises more slowly due to its allocation to health-care services with smaller growth in average per-enrollee costs.

Projecting Total Medi-Cal Benefit Expenditures

Combining the above baseline projections for fee-for-service and Managed Care produces a 10-year forecast for total Medi-Cal spending on benefits, which we term Medi-Cal Benefit expenditures. This expenditure measure captures practically all the benefits (80 percent, as shown in Figure 1.3) paid on behalf of the overall population of Medi-Cal enrollees (note that this excludes non-benefit administrative costs). Step 6 outputs projections for aggregate expenditures $Y_{kj}(t)$ by age cohort and service category for every forecast year. Summing these projections for fee-for-service and Managed Care with each year constructs the baseline forecast for total Medi-Cal Benefits expenditures throughout the projection horizon. As done above, one can also aggregate the values of $Y_{kj}(t)$ as appropriate to formulate breakdowns of total expenditures into service-category and age-cohort segments, offering several perspectives from which to view the baseline forecasts of total Medi-Cal Benefits spending.