



Trends in California teacher demand: a county and regional perspective



Institute of Education Sciences
U.S. Department of Education



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July 2008

Prepared by

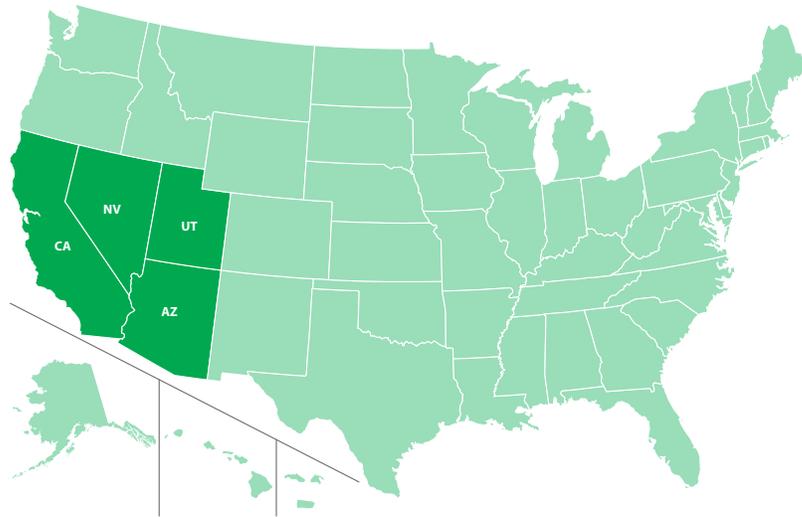
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Trends in California teacher demand: a county and regional perspective

The report highlights the differences among California’s counties and regions in their use of underprepared teachers and their needs for new teachers in the coming decade as driven by projected student enrollment changes and teacher retirements. The findings show county and regional variations in key factors that influence teacher labor markets.

If every California K–12 classroom is to have a fully credentialed teacher, state policymakers and other education decisionmakers must monitor the teacher labor market and take action when possible to ensure an adequate supply of teachers. Previous analyses of California’s teacher supply and demand have contributed substantially to the understanding of the overall dynamics of the teacher labor force at a statewide level (for example, Guha et al. 2006; Esch et al. 2005).

However, finer grained analyses of labor market variables could provide valuable information for addressing the teacher supply issue, especially considering research that suggests the local nature of teacher labor markets (Martin 2003; Boyd et al. 2005) and the regional variation in certain key labor market variables (Guha et al. 2006). This report highlights the differences among California’s counties and regions (clusters of contiguous counties) in

their use of underprepared teachers (defined as teachers who have not completed a teacher preparation program and attained a preliminary or professional clear credential¹) and their need for new teachers in the coming decade, as driven by projected student enrollment and teacher retirement. Although this report does not analyze projected county-level attrition or new teacher supply, its findings highlight county and regional variations in key factors that influence teacher labor markets.

Using data from state agencies, researchers examined three variables: current use of underprepared teachers, projected enrollment-generated demand for teachers, and projected teacher retirement-generated demand. The findings reveal differences in how these variables play out across California counties and regions. For example, while the use of underprepared teachers averaged 6 percent statewide in 2005/06, in 2 counties underprepared teachers accounted for more than 10 percent of the teacher workforce and in 16 for less than 2 percent. Likewise, while 21 of California’s 58 counties will likely experience double-digit enrollment growth as a percentage of current enrollment over the next decade, 22 counties are expected to see declining student numbers. Finally, more than 40 percentage points divide counties with the highest projected

teacher retirement rates from those with the lowest. When the two sets of projections were combined to show the net effect of retirement growth and student enrollment growth, there was a spread of 64 percentage points between the county facing the highest projected demand (68 percent) and the county facing the lowest demand (4 percent). Because this analysis was unable to account for nonretirement attrition, these estimates may not reflect the total number of teachers needed over the decade.

The analyses, based on expected teacher retirements and student enrollment growth, suggest that California's Central Valley (North and South San Joaquin Valley and Upper and Sacramento Metropolitan Valley) and Inland Empire (Riverside and San Bernardino Counties) will face some of the highest demand for new teachers in the coming decade. This demand will come on top of other challenges facing most of these regions, including high poverty rates, low educational attainment, and diverse student populations. It is not possible to predict any resulting teacher supply-demand imbalances, however, without a complete analysis of all the teacher labor market variables in these and other regions, which this report does not provide.

As local decisionmakers consider the implications of the information provided in this report, they may want to seek out additional county- or district-level data for a fuller picture of regional teacher labor markets. Further investigation at the state level, such as research into the degree to which new teacher supply in California is localized rather than uniform across the state, could help state policymakers as they consider what interventions might effectively address the anticipated differential demand for new teachers across counties and regions. When the state's new longitudinal teacher database becomes available in a few years, it could facilitate a more complete analysis of the regional teacher labor market issues that this report highlights.

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Note

1. California grants preliminary teaching credentials to candidates who have successfully completed either a traditional fifth year or a blended teacher preparation program that includes student teaching and have passed various examinations; teachers must progress to a clear credential within five years (Loeb and Miller 2006).

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The report highlights the differences among California's counties and regions in their use of underprepared teachers and their needs for new teachers in the coming decade as driven by projected student enrollment changes and teacher retirements. The findings show county and regional variations in key factors that influence teacher labor markets.

WHY THIS STUDY?

A substantial body of research shows that effective teachers are a critical classroom resource (see, for instance, Nye, Konstantopoulos, and Hedges 2004; Rivkin, Hanushek, and Kain 2005). Considerable attention at both the state and federal levels has been focused on ensuring that every student has access to high quality teachers. The No Child Left Behind Act of 2001, for example, requires that all teachers of core academic subjects be “highly qualified.”

If every California K–12 classroom is to have a qualified teacher, the state's education decision-makers need to monitor the teacher labor market to ensure an adequate number of teachers. Multiple factors contribute to teacher supply and demand. New teacher supply generally consists of newly credentialed teachers, though interns, credentialed teachers who re-enter the field after a break, and those who come from other states can also add to supply. On the demand side, changes in student enrollment, teacher attrition, and teacher retirement all play a role, as can policy changes, such as class-size reduction. All these factors contribute to a dynamic labor market in which a substantial change in any one variable can result in an imbalance.

California began to see such an imbalance in the late 1990s, as districts implemented the state's ambitious class-size-reduction policy, which led to rapid growth in the demand for new teachers. Unable to turn away students, many districts tried to meet the demand by hiring educators who were not fully credentialed. According to the Center for the Future of Teaching and Learning (CFTL), which has tracked California's teacher labor market in annual reports to the state since 1997, by 2000/01, 42,000 California teachers (14 percent) were working without being fully credentialed (Guha et al. 2006).

As of 2005/06 California still employed close to 18,000 underprepared teachers—almost 6 percent of the workforce (Guha et al. 2006). As the state

works to reduce the number of underprepared teachers and to reduce future supply-demand imbalances, it is essential to anticipate changes in demand for teachers and respond accordingly. For the last several years CFTL's annual reports have provided information for this type of planning at a statewide level. However, other than CFTL's brief highlighting of certain county-level underprepared-teacher and teacher-demand trends in its 2006 report (Guha et al. 2006), no recent policy reports analyze teacher labor market trends within California at the county or regional levels. This report aims to fill that void.

Geographic variations in the teacher labor market are likely to be important for a variety of reasons. Research shows that labor markets tend to be local (Martin 2003). For instance, recent research in New York finds that teachers prefer to teach close to where they grew up and, controlling for proximity, they prefer areas with characteristics similar to those in their hometown (Boyd et al. 2005). In New York City, for instance, between 1998 and 2001, 90 percent of all teachers took their first jobs within 40 miles of their hometown.

Such findings suggest that state-level planning to expand the state's overall teacher supply may not

be adequate for dealing with the localized nature of the teacher labor market. For example, turning out more teachers in one part of the state would not necessarily help meet demand in another part. County- or regional-level planning thus appears to be equally important.¹ Teacher labor market information at

the county level can serve two purposes. It can improve the state's ability to react to county and regional differences in labor market conditions. And it can inform the staffing efforts of districts and of county offices of education, which support districts' teacher staffing efforts and have recently received state funding to broaden their efforts in teacher recruitment.

Data constraints preclude a full analysis of all current and future teacher supply and demand factors influencing California's K–12 education picture by county and region (clusters of contiguous counties; see next section). For instance, while teacher attrition affects teacher demand, there is no system for tracking teachers longitudinally.² However, the national Schools and Staffing Survey (SASS), which collects information on teacher attrition in schools by locale (rural, urban, or suburban) found only modest differences in attrition across schools for locale for the 1999/2000 SASS (Ingersoll 2003). Analysis of new teacher supply from California institutions of higher education is similarly constrained, in this case by a lack of information about where graduates from each California institution end up teaching. Finally, the full impact of policy changes is difficult to estimate because different districts respond by reallocating teachers and responsibilities differently.

While this report does not provide a complete picture of California's teacher supply and demand, it does offer some key pieces, starting with an analysis of the current use of underprepared teachers by county and region (for a discussion of how the report defines *teacher*, see box 1). Then, looking to the future, it focuses—also by county and, as applicable, by region—on two demographic trends that will influence teacher demand: student enrollment and teacher retirements. However, because this analysis was unable to account for nonretirement attrition, these demand estimates represent an unknown portion of the total number of teachers that will be needed over the next decade.

Two questions guided the research:

- How do existing patterns in the use of underprepared teachers vary at the county level?
- How will projected teacher retirements and projected changes in student enrollment intersect in particular counties to produce differential demand for teachers over the next decade?

State-level planning to expand the state's overall teacher supply may not be adequate for dealing with the localized nature of the teacher labor market

BOX 1

Study definitions, data sources, and projection assumptions

The study uses longitudinal analysis to examine two major demand factors that vary at the county level: changes in student enrollment and in teacher retirement. The study also highlights county-level differences and patterns in the use of underprepared teachers as of 2005/06. Data limitations precluded analyzing county-level teacher attrition.

Defining *teacher*

For analyzing the teacher labor market, the term *teacher* can be defined in various ways. For example, teachers could be defined as those who meet the “highly qualified” criteria of the No Child Left Behind Act, which in California means being fully credentialed or enrolled in a state-approved teacher internship program and demonstrating competence in the subject area being taught. The Center for the Future of Teaching and Learning (CFTL), in its annual inventory of the state’s teacher workforce, defines a teacher in the negative—identifying as “underprepared” any teacher who has not completed a teacher preparation program and attained a preliminary or professional clear credential.¹ This group includes teachers with waivers, emergency-permit holders, and interns (Guha et al. 2006, pp. 11–12).

While it might be preferable to define a teacher by effectiveness, possession of teaching credentials has been widely used in the absence of data systems that allow direct measurement of teacher effectiveness. For addressing the first research question, *teachers* are defined as CFTL does,

referring to teachers who are not fully credentialed as underprepared. One reason is to make the analysis more useful to California decisionmakers who have been tracking this issue through CFTL’s reports.

Data sources

Data for the study came from three state databases (for details, see appendixes A and B). Data on the use of underprepared teachers are from the California Department of Education’s (2005) October 2005 data collection for the Personnel Assignment Information Form (PAIF), which reports the credential status of all K–12 teachers in the state’s public schools at the school, district, and county levels. Underprepared teachers are those who are authorized to teach through a district or university internship, emergency permit, pre-internship, or waiver.

Data on student enrollment are from the California Department of Finance (2006) annual county-level student enrollment data (for 1994/95–2005/06) and enrollment projections for the following 10 years (2006/07–2015/16). Enrollments as of 2005/06 are from the California Department of Education (2006a).

Data on teacher retirement are from the California State Teachers’ Retirement System (CalSTRS), which serves most teachers in California and maintains data on their retirement patterns (California State Teachers’ Retirement System 2006). Data for 1994/95–2005/06, including county-level data, show members’ ages and retirement year. Because the CalSTRS data system does not distinguish between teaching and nonteaching staff, researchers used

teachers’ age data from the PAIF for 2001/02–2005/06 to adjust the CalSTRS retirement data to represent the retirement patterns of teachers only.² Previous studies have not made such adjustments.

Key assumptions of the projections

Several assumptions were made for the projections of student enrollment- and teacher retirement-driven demand based on current school conditions and the historical behavior of teachers (for details, see appendix A). If these assumptions are incorrect, the projections could under- or overstate demand.

- For teacher demand based on student enrollment growth, it is assumed that counties will maintain their current pupil–teacher ratios.
- For teacher demand based on retirement, it is assumed that CalSTRS members and K–12 teachers of the same age in a given county retire at the same rate and enter the workforce at the same rate and that all other factors not directly controlled in these analyses remain constant.

Notes

1. California grants a preliminary teaching credential to candidates who have successfully completed either a traditional fifth year or a blended teacher preparation program that includes student teaching and have passed various examinations. Teachers must progress to a professional clear credential within five years (Loeb and Miller 2006).
2. These data included the number of teachers within each county for a given age and were obtained independently from the California Department of Education.

WHAT WE LEARNED

To explore how existing patterns in the use of underprepared teachers vary at the county level, analyses were conducted of data from the California Department of Education's Personnel Assignment Information Form (PAIF), which reports the credential status of all K–12 teachers in the state's public schools, as well as their age. To project county-level teacher retirements for the next decade California State Teachers' Retirement System (CalSTRS; 2006) data on county-level retirement rates over several years were combined with PAIF data from the California Department of Education (2005) showing the age distribution of the current K–12 teacher force in each county. To show how projected changes in enrollment in specific counties would translate into demand for new teachers, student enrollment projections from California's Department of Finance (2006) were combined with county-level pupil–teacher ratios. These two demand factors were then combined to examine how projected teacher retirements and projected changes in student enrollment could intersect in particular counties to produce differential demand for teachers over the next decade and to catalog projected needs for new teachers in the 58 California counties. The projected need for new teachers is based on the current mix of teaching staff, irrespective of teachers' credential status. (Box 1 and appendix A discuss key assumptions underlying the projections and the data and analyses in more detail.)

The next sections detail the county-level variation in the current use of underprepared teachers, future enrollment-driven demand, and future retirement-driven demand. The following sections then discuss how future retirement and enrollment trends will intersect in particular counties and regions. The findings are generally presented first in percentages and then in numeric counts to provide additional context (box 2 on metrics explains how the two measures complement one another). Appendix C provides the detailed county by county results for each of this study's primary analyses and is the basis for much of

the discussion throughout the findings section. Map 1 depicts the regional delineations referred to throughout the report.

Use of underprepared teachers by county

The statewide average for the use of underprepared teachers in California was 6 percent in 2005/06. Of the approximately 18,000 underprepared teachers statewide, about half held university or district intern credentials, while the rest held waivers, permits, or pre-intern credentials.³

At the county level the percentage of underprepared teachers ranged from a high of 12.5 percent in Imperial County to a low of zero in Sierra County (table C1 in appendix C). While the counties with the highest percentages of underprepared teachers do not seem to fit a clear geographic pattern, those with the lowest percentages are in the Upper Sacramento Valley, North Coast, Northeast Inland, and East Inland regions (see map 2).

As of 2005/06 more than 80 percent of the state's 17,839 underprepared teachers were located in 11 of California's 58 counties (table 1; see table C2 for the entire list of counties). These counties, which are in the top 20 percent for number of underprepared teachers, are also among the 13 largest counties in current student enrollment.

Student enrollment projections by county

At the state level historical and projected student enrollment data suggest that after a period of steep increases during the past decade, statewide enrollment growth is leveling off (figure 1). Annual enrollment growth has slowed steadily from a rate of almost 3 percent in 1996/97 to less than 0.5 percent in 2006/07. Cumulative enrollment growth over the next decade (2005/06–2015/16) is projected to be just over 2 percent, with differential growth patterns for elementary and high schools. Elementary enrollments began declining in 2004 and are expected to continue declining until 2008/09 and then start growing again. High school enrollments are expected to grow slightly until

BOX 2

Reporting results in numeric counts and percentages

This study reports results in both numeric counts and percentages. Each provides a slightly different perspective.

With numeric counts alone, this report would be a story largely of California's 10 biggest counties. For current use of underprepared teachers, projected retirements, and projected retirement- plus enrollment-related demand, in numeric counts the top 20 percent of counties is dominated by the 10 counties with the largest student enrollments. (Projected

enrollment-related demand is the only exception.)

Including percentages broadens the story. In addition to making it easier to consider future demand relative to current workforce size in a given area, percentages help convey the relative impact of changes in demand across counties or regions that might differ in their capacity to address future demand. For example, the need to hire 60 teachers over the next decade will pose a greater challenge for a county currently employing 100 teachers than for one employing 1,000 teachers; the first county will need to replace 60 percent of its current teachers, while the second will need to replace 6 percent.

But reporting percentages alone would make it difficult to judge the differences in absolute need for teachers or to aggregate teacher demand. In a state where 10 counties educate more than 70 percent of students, and one county (Los Angeles) educates close to a third, differences in absolute numbers are important. Consider that Los Angeles ranks last (58th) among California counties in the percentage of its current workforce that will need to be replaced to meet retirement- and enrollment-related demand over the next decade. But with a projected demand for close to 3,300 teachers, Los Angeles ranks 10th in numeric need.

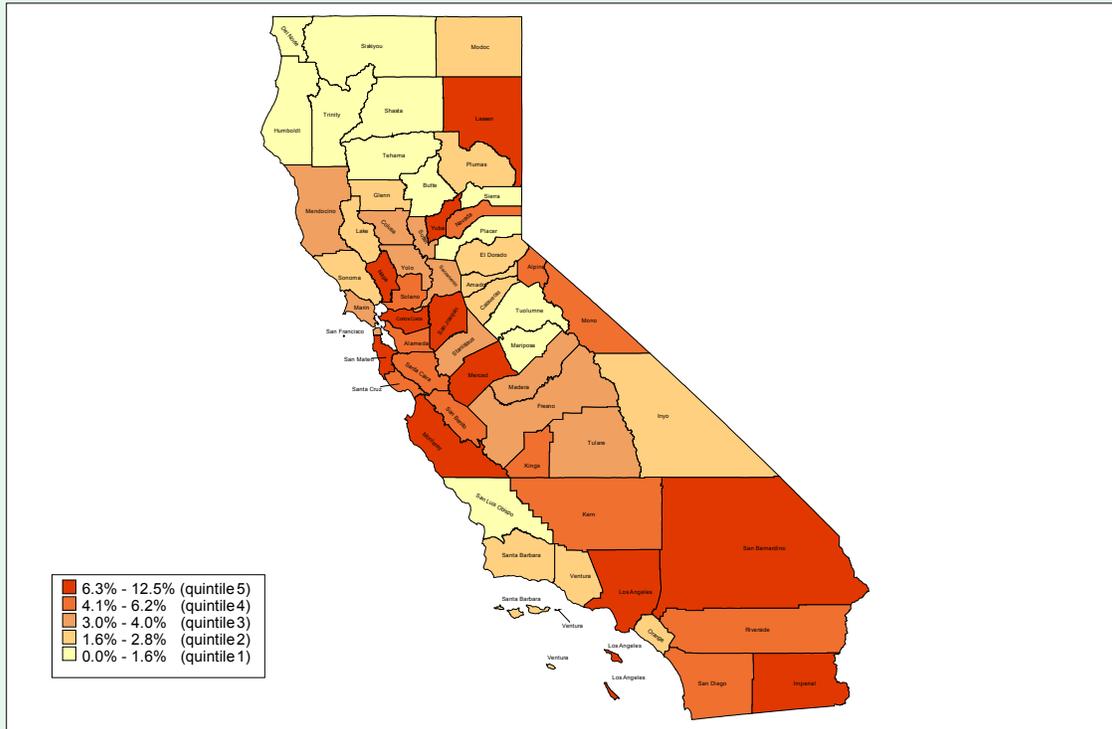
MAP 1

Regional categories of California counties

Note: These regions were developed for this report.

Source: The Central Valley regions are based on Johnson and Hayes (2004) and Public Policy Institute of California (2004); the Inland Empire region is based on Downs (2005).

MAP 2

Percentage of underprepared K–12 teachers in California by county, 2005/06

Source: Authors' analysis based on data from California Department of Education (2005). Table C1 in appendix C reports the underlying data, which are based on tabulations of the percentages of underprepared teachers by county; see box 1 and appendix A for details.

2007/08 and then begin declining until 2012/13 (California Department of Finance 2006).

These modest projections for enrollment growth statewide mask considerable regional variation. For more than 30 years California's inland areas have experienced faster population growth rates than coastal areas have, and these trends are expected to continue. The Inland Empire (Riverside and San Bernardino Counties) has been one of the fastest growing metropolitan areas in the country for decades (Johnson 2003). The Central Valley (North and South San Joaquin Valley and the Upper and Sacramento Metropolitan Valley) also has experienced growth in recent decades, with its population more than doubling in the last 30 years and expected to double again between 2000 and 2040 (Johnson and Hayes 2004). These general population trends are reflected in the region's student enrollment growth.

The data used in this study show that between 2005/06 and 2015/16, 21 counties are expected to experience double-digit enrollment growth (as a percentage of current enrollment), while 22 counties are expected to experience declining enrollment (table C9 in appendix C). Among the 10 counties with the largest enrollment as of 2005/06, half are expected to have increasing enrollments (all but one in double digits) and half are expected to have declining enrollments.

Using current student–teacher ratios to translate projected student enrollment growth into projected teacher demand shows that most of the counties with the fastest growing enrollment-driven projected demand are in the Central Valley and Inland Empire (map 3).

Generally speaking, the coastal and northern counties, and a few eastern counties (Amador, Tuolumne, Mariposa, and Inyo), are expected to

TABLE 1

Number and percentage of underprepared K–12 teachers in California, 2005/06 (top 20 percent of counties based on number of underprepared teachers)

County	Number	Percentage
Los Angeles	6,891	8.5
San Bernardino	1,332	6.9
Riverside	1,074	5.9
San Diego	1,042	4.1
Santa Clara	743	5.8
San Joaquin	698	10.1
Alameda	692	6.2
Orange	611	2.7
Contra Costa	596	7.1
Kern	498	6.0
Sacramento	409	3.4
Total	14,586	81.8

Source: Authors' analysis based on data from California Department of Education (2005); see box 1 and appendix A for details. Tables C1 and C2 in appendix C report these data for all counties.

experience declining teacher demand based on student enrollment (the bottom two quintiles) over the next decade. All the counties registering losses of more than 1,000 students over the coming decade are coastal counties (table C9 in appendix C). That may in part be because most of the state's population is concentrated along the

coast (Johnson 2003) and because migration from coastal to inland communities has been occurring over the last three decades (Johnson and Hayes 2004). Map 4 shows how county-level changes in projected student enrollment could translate into county by county teacher demand over the next decade.

Retirement projections by county

The aging of the baby boom generation (people born between 1946 and 1964) is expected to lead to the number of seniors in California doubling between 2000 and 2025 (Lee, Miller, and Edwards 2003). These mid-century boomers make up a large portion of the state's current K–12 teaching force, and as they begin to reach retirement age, their departures are likely to have a strong impact on school staffing. For those born in the first year of the baby boom, 2006 marked their 60th birthday and the beginning of the coming retirement wave.

A graph of the age distribution of California teachers as of 2005/06 shows that close to 84,000 teachers, or 27 percent of the teaching workforce, were between the ages of 51 and 60 (figure 2). That indicates that the wave of teacher retirements will continue over the next decade as teachers now in their 50s reach the peak retirement ages of 60–62.

FIGURE 1

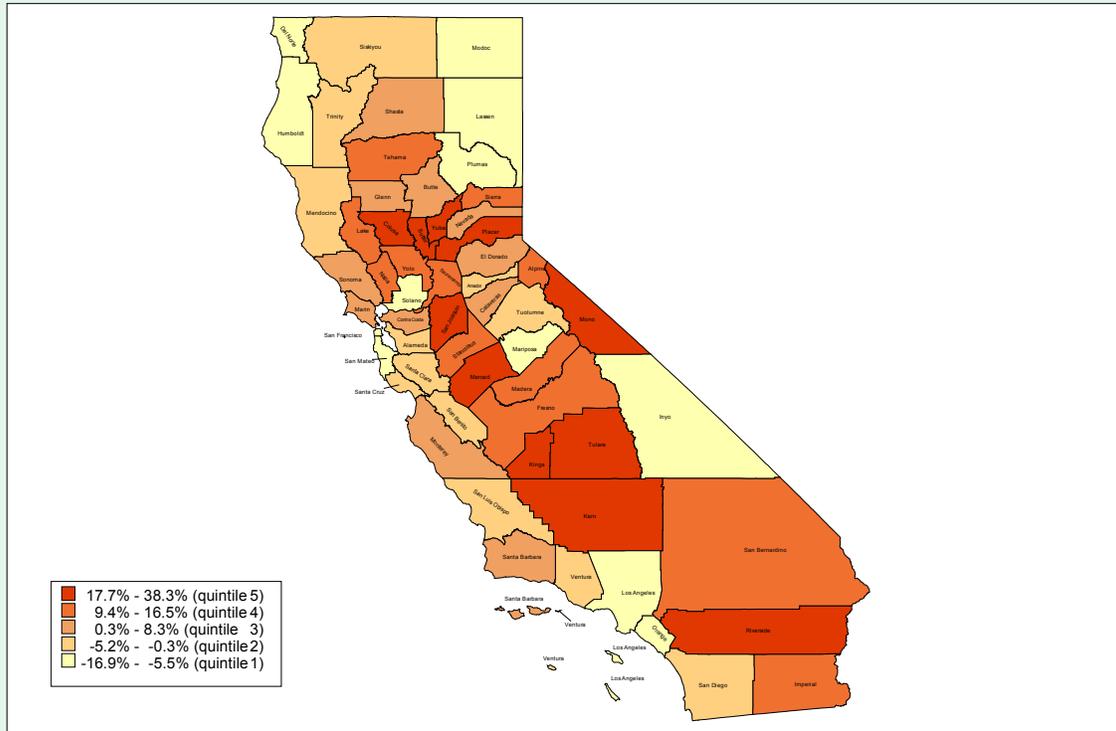
Historical and projected California K–12 student enrollment statewide, 1994/95–2015/16



Source: Authors' analysis based on data from California Department of Finance (2006).

MAP 3

Estimated percentage change in the number of K–12 teachers needed in California from 2005/06 to 2015/16 based on student enrollment projections, by county



Note: Workforce needs were computed by applying county-level pupil–teacher ratios in 2005/06 to projected enrollments, as described in appendix A. Table C5 in appendix C reports the data underlying the map.

Source: Authors' analysis based on data from California Department of Finance (2006) and California Department of Education (2006a).

Analysis of CalSTRS retirement rates, adjusted to focus on K–12 teachers, shows that over the last five years statewide teacher retirements have hovered around 2 percent annually. Retirements will increase over the rest of this decade, peaking in 2009/10. Retirements are predicted to reach more than 8,000 annually in 2008/09, 2009/10, and 2010/11 before beginning to decline (figure 3).⁴

As do the trends in enrollment, the retirement projections show county-level variation in the proportion of the workforce that will retire by 2015/16. The lowest rate in the state is in Alpine County, with 18 percent of its teachers projected to retire over the next decade (see table C3 in appendix C). At the other extreme is Plumas County, with 59 percent of its teachers projected to retire. Most of the top 10 counties for student enrollment are expected to lose 20–30 percent of their teacher

workforce over the coming decade to retirements. Sacramento County, at 45 percent, is projected to lose a larger share of its teachers than others in the top 10 percent enrollment counties.

The counties in the top 20 percent of retirements are projected to lose 41–59 percent of their teachers. These high-retirement areas form a band around the Central Valley in the top half of the state. Sacramento—also an outlier among the 10 largest counties in student enrollment—is the only Central Valley county that falls into this high-retirement group (map 5).

Several of the counties registering the lowest projected retirement rates are in the Central Valley and Inland Empire. These counties have been experiencing rapid enrollment growth for years, and previous research suggests that they are likely to