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Forecasting the Supply of and Demand for Physicians in the Inland Southern California Area

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Prepared for the County of Riverside Economic Development Agency
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SUMMARY

INTRODUCTION

In 2005, the University of California Health Sciences Committee (UCHSC), the body responsible for advising on California’s state-run secondary medical and allied health schools, predicted the likelihood of a physician shortfall in California by the year 2020, based in large part on a report issued by the University of Albany Center for Health Workforce Studies (CHWS), commissioned by the state of California. This report made a number of recommendations with respect to UC medical education enrollment, including calling for an assessment of the feasibility of developing one or more comprehensive new medical student education programs by (or before) 2020.

In 2006, University of California, Riverside (located in Riverside County), submitted a preliminary proposal to establish a school of medicine. Almost simultaneously, University of California, Merced (located in the San Joaquin Valley, in the central part of the state) also submitted a preliminary proposal to establish a medical school.

A coalition of medical, civic, and other leaders who championed the UC Riverside proposal asked RAND to independently assess the projected demand and supply for physicians in the area surrounding UC Riverside in the coming decades. This region is sometimes referred to as Inland Southern California, the southeastern-most part of the state, and comprises four counties: Riverside, San Bernardino, Inyo, and Imperial. In addition, we examined projected supply and demand for the region around UC Merced (the SJV region) and California overall.

COMPARING ISC, SJV, AND CALIFORNIA AS A WHOLE

California, the nation’s most populous state and one of its most diverse, has eight medical schools, including five UC medical schools and three private medical schools. Combined, the ISC and SJV regions contain 28 percent of the state’s population; yet, between them, they contain only one medical school (Loma Linda University, a private school in San Bernardino County).
The per-capita income in ISC and SJV is lower than in the state as a whole, with SJV considered one of the most economically distressed regions in the United States. According to most health indicators we examined, the health of ISC and SJV residents is worse than the average of those in the state.

FORECASTING THE PHYSICIAN SUPPLY IN ISC, SJV, AND CALIFORNIA

We used data from the American Medical Association Masterfile to estimate the current supply of patient-care physicians (which includes medical residents and fellows, hereafter referred to as residents) and to project the supply in 2020 in the ISC, SJV, and the state. In 2004, the ISC and SJV regions both had substantially fewer patient-care physicians per 100,000 persons (128.7 and 138.4, respectively) than the state as whole (222.6).

We then projected demand under four different hypothetical scenarios. Scenario 1 assumed the status quo in the training of physicians in California that is, that recent annual rates of change in the number of practicing physicians will persist through 2020. Based on this scenario, we projected that by 2020, SJV will have a slightly higher number of physicians per capita (134.8) than ISC (127.3), and both will remain well below the state average. Scenario 2 assumed a gradual 20 percent increase in the number of residents above current levels by 2020. Increasing the number of residents raises the supply of patient-care physicians immediately (because most residents provide patient care), and following completion of training, some residents will choose to practice in the region and thus contribute to the “permanent” supply of physicians. Scenario 2 produced a forecast of physicians per capita that is 2.4 percent higher than Scenario 1 for the state, 2.1 percent higher for ISC, and only 0.9 percent higher for SJV (reflecting the much smaller proportion of residents currently in SJV). Scenario 3 posited that UCR would open a new medical school and affiliated graduate medical education programs according to its implementation schedule for resident recruitment. Scenario 4 posited both an increase in the percentage of residents trained and a new medical school, which would result in the largest gains in patient-care physicians per capita. Even
in Scenario 4, the most aggressive of the four, the projected (2020) ratio of physicians to population for ISC (144.6) and SJV (136.3) would remain at about half the statewide average (267.7). Our assumptions are relatively robust to different inputs for the physician-supply projection component.

**FORECASTING FUTURE DEMAND FOR PHYSICIANS IN ISC, SJV, AND CALIFORNIA**

We used trend analysis to project physician demand at the county level for the state as a whole and for SJV and ISC, separately. Consistent with other national studies, we find strong evidence that the number of physicians per capita is tied to such county-level economic measures as average annual unemployment rates and median per-capita income. Our study also incorporated population composition measures, including age.

The number of physicians per 100,000 persons is greater in counties with proportionally fewer persons under age 15, which may reflect a lesser demand for physicians by younger populations. We found no association between physicians per capita and a county’s race and ethnic composition. Accounting for population and regional economic factors, neither ISC nor SJV has significantly fewer physicians per 100,000 than the state average.

Projecting to 2020, differences in physician demand among ISC, SJV, and the state are again due to differences in population composition and regional economy.

**BALANCING SUPPLY AND DEMAND**

We project that with no increase in the physician supply pipeline, patient-care demand will exceed supply by about 60 physicians per 100,000 persons in ISC by 2020. If the number of first-year residents who begin training in California were to increase starting in 2008 (Scenario 2), the projected gap would narrow slightly. If UC Riverside were to build a medical school and affiliated graduate medical education programs as proposed (Scenario 3), the percentage gap between supply and demand would decline by 24 percent. A similar decline (29 percent) in the projected gap between supply and demand would result under Scenario
4, which both increases residents by 20 percent by 2016 and builds a new medical school with affiliated residency programs in UCR (see Figure S.1).

**Figure S.1. Projected Supply under Each Scenario Relative to Projected Demand, ISC, 2020**

Our projections also predict that if the population and age composition change as predicted by the state’s Department of Finance, and if the rate of economic growth of SJV slows relative to ISC and the state (as projected by the state), the supply of patient-care physicians in SJV will fall short of demand by a smaller amount than that for ISC. We emphasize that our demand model does not address the appropriate proportion of physicians per capita; rather, it predicts demand based on the current association between population, regional economy, and physician utilization.

Forecasting physician supply and demand is challenging, particularly for a time horizon over ten years. The inherent difficulty is magnified when projecting for small geographic units, such as counties or groups of counties, because physicians are readily able to move across such boundaries in response to local economic conditions or population loss or gain. Economic theory says that physicians will follow demand for their services. Thus, our projected supply shortfalls
in ISC and SJV are likely overestimated. Our model accounts for such changes by assuming that the higher rates of physician growth in ISC and SJV that have been observed in recent years relative to the state average will grow closer to the state average in the future. But we note that our supply projections are sensitive to how much we assume ISC and SJV rates will approach the state mean.

Our report highlights conditions under which physician supply is likely to partially close the gap with physician demand. By monitoring population composition and economic conditions, analysts can modify their expectations about physician demand periodically and see how demand is tracking with supply.

CONCLUSIONS

Our analyses suggest that under all the scenarios we considered, the demand for physicians in ISC will exceed the supply if the recent trends underlying our supply model continue. The analyses indicate that a case can be made for moving forward with the UCR medical school proposal if the goal is to close the projected physician demand-supply gap in the ISC region. We foresee a projected shortfall in the number of patient-care physicians per capita necessary to meet the demand for physicians in the four-county ISC region. Opening the proposed UCR medical school would close this projected gap by 16 percent, primarily by increasing the number of medical residents and fellows (most of who provide patient care) recruited as part of the affiliated graduate medical education program. A second contributing factor would be the increase in the expected retention of residents both regionally and in the state. Our projection hinges strongly on assumptions about future economic factors, age composition, and population change. It also depends on future trends in physician work efforts. For example, if physicians were to reduce their patient-care hours by 10 percent between now and 2020, the projected gap between physician supply and demand would double.

Additional factors need to be considered when deciding whether and where to open a new public medical school. One important factor is whether the primary objective is to address future rather than current
regional and state health care needs: A person who begins medical school this year is four to five years from being able to practice medicine as a medical resident. Another goal in opening a new medical school might be to increase the access of California residents and underrepresented minorities to a medical education: Of the 44 states with at least one medical school, California ranks 39th in medical school slots per capita and 43rd in public medical school slots per capita. Another advantage might include reaping the economic costs and benefits of opening a new medical school.