HEALTH CARE AMONG CALIFORN

Don Villarejo

INTRODUCTION

Hired farmworkers, their families, and most of the communities in which they reside have the worst access to health care services in the entire state. While many health care policy analysts believe that literally everyone in California has access to care, and the critical questions are who provides it and who pays for it, the data clearly demonstrate that a very large proportion of the residents of hired farmworker communities do not even have access. Though the data are scant, they show that large numbers of hired farmworkers are doing without the health care services they need, whether regular physical examinations, preventive dental care, preventive vision care, or adequate immunizations, because they lack medical insurance and a usual source of health care.

To understand and interpret the status of health care access for hired farmworkers I discuss four main topics: (1) the availability of health services in rural California communities; (2) the ability of the rural working poor to access those services; (3) our current knowledge about hired farmworkers; and (4) federal rural health policy and California's disproportionately small share of federal resources compared to the shares of other rural areas of the United States.

Most of California's land area is clearly rural, whether it is desert, forest, open range, or crop-growing acreage. Emphasizing the rural character of the state is the fact that half of California's 100 million acres are administered by public natural resource agencies: the Bureau of Land Management, U.S. Forest Service, National Park Service, and California Department of Parks and Recreation.

California's position as the nation's leading agricultural state underscores the economic importance of its rural areas. In 1997, California produced $26.8 billion in farm cash receipts from the sale of agricultural commodities, more than the combined value produced in the second- and third-ranking states, Iowa and Texas. California's farm production is so large that it is difficult to fully grasp: each year California farmers receive cash receipts from farm commodity sales that are *more than three times larger than the box office receipts of the entire U.S. motion picture industry.*

The size and importance of California's fishing, timber, oil, mining, and outdoor recreational industries are also well known. Even though most Californians are urban residents, access to the rural parts of the state is frequently cited by city dwellers as an especially important part of their quality of life.

According to the 1990 Census of Population and Housing, California had 2,188,143 rural residents, more than any other state in the western United States. In part, this reflects the fact

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that the state's major population centers are concentrated on its coastal shelf, a comparatively small geographical area. Since the census definition of *rural* communities is primarily based on whether they have fewer than 2,500 residents, a significant number of California's smaller agricultural or forest communities are classified by the census as *urban*. Many isolated farm towns, such as Huron, Mendota, and Firebaugh, where agriculture is the only economic activity, or remote forest communities, such as Willits or Crescent City, are not considered rural by the census. This is a problem, since virtually all residents of these communities, as well as those who live in major cities, regard these small isolated cities as prototypically rural in character.

To address this obvious definitional problem, the census recognizes another population category that includes such communities: *Urban—outside of urbanized area* as contrasted with *Urban—inside of urbanized area*. The census total of residents who live in communities that are Urban—outside of urbanized area is 2,105,967, essentially equal to the census Rural population. The distribution of the state's rural, urban-nonurbanized, and urban-urbanized population based on the 1990 census is shown in Figure 1.*

Thus, the census rural and urban-nonurbanized population is 4,143,575, about one out of seven residents—a total that usually surprises policymakers.

This population is quite distinctive. For example, communities in which hired farmworkers are a plurality of the labor force are currently experiencing the most rapid population growth of all communities in the state. During the 1980s, they grew at twice the rate of major urban centers. Since these communities also have both a much younger population and a higher fertility rate than California's major cities, they will continue to outstrip the state as a whole in population growth for many years to come.

At the same time many hired farmworkers live in larger cities that are centrally located within important agricultural regions. Thus, Fresno, Stockton, Oxnard, and Salinas are home to many tens of thousands of such workers.

AVAILABILITY OF HEALTH SERVICES IN RURAL CALIFORNIA

Rural health care service areas of the state have been defined and characterized by the Rural Health Policy Council (RHPC), an agency created by the California Department of Health Services (DHS) to advocate for rural residents. The definition uses the Medical Service Study Area (MSSA) concept developed by the Office of Statewide Health Planning and Development. The MSSA is a small geographic area in which residents are likely to seek health care services, whether that is a neighborhood within a large city or an entire small city. There are 487 MSSAs in the state, the majority in urbanized areas. The RHPC definition of rural MSSAs is:

> Rural areas are Medical Service Study Areas . . . , as defined by the Office of Statewide Health Planning and Development, that have a population density of less than 250 persons per square mile and have no incorporated community with a population greater than 50,000 people.

This RHPC definition of rural areas conflicts with the census definition of rural, as will be

*The figures are inserted at the end of the paper, before the Notes section.

discussed further in the fourth major section of this paper. However, the total population within rural MSSAs is 3,711,445, quite close to the census total of rural and urban—nonurbanized populations combined. Thus, rural MSSAs are likely to capture the intuitive understanding of *rural* that most state residents would agree on. Figure 2 shows the state's rural and urban populations as of the 1990 census based on the RHPC definition.

The MSSA database, assembled and maintained by the Primary Care and Family Health agency of DHS, allows us to characterize and describe both the population and the medical services of the RHPC-defined rural areas. Of the 487 MSSAs in California, 210 are rural according to the RHPC definition.[1] Population data refer exclusively to findings of the 1990 Census of Population and Housing, while medical service data refer to the agency's own compilation of primary care physicians, specialty physicians, birth counts, and other similar measures of health care needs or services.

A number of important findings can be obtained from analysis of the MSSA database that pertain to rural health care access. First, the number of primary care physicians relative to population is twice as great in California's urban MSSAs as in rural MSSAs. Simply, the average urban resident has access to twice as many primary care physicians as the average rural resident.

The number of residents (1990 census) per primary care physician in rural MSSAs is, on average, 1,924, while urban MSSAs average 986. Of the 210 rural MSSAs, 33 (16%) have no primary care physicians at all. In contrast, just two of the 277 urban MSSAs (1%) are totally lacking in primary care physicians. While most of the rural MSSAs without a primary care physician have relatively small populations, one-fourth have more than 5,000 residents, including one area with more than 20,000 residents.

Second, rural MSSAs comprise about 87% of the entire state land area. Even though they contain a substantial number of residents, some 3.7 million, their average population density of 27 persons per square mile is extremely low. This affects the cost of providing needed health care services that residents can reach without undue hardship. In contrast, urban MSSAs occupy just 18% of the state land area but include 87% of the state's total population. Urban MSSAs have an average population density of 1,383 residents per square mile, more than 50 times the density in the rural MSSAs. In other words, even though California has a very large number of rural residents, they are, on average, dispersed over such a large area that it becomes very difficult to provide services at a level found in urban areas.

Two very different types of communities are found among the 210 rural MSSAs. One consists of the 98 rural MSSAs in which the Hispanic population is 12% or less of the total, roughly half the statewide average, according to the census. Without exception, these are *frontier* communities, the term RHPC uses to describe counties that have no city with a population of 20,000 or more. All 98 frontier communities have economies based on mining, forestry, cattle ranching, or rural tourism, such as Adin-Lookout (Modoc County) in the north and Argus-Trona (San Bernardino County) in the south. Of these frontier MSSAs, 15 (15%) lack a primary care physician.

The second principal type of rural MSSAs consists of the 23 areas in which the Hispanic population is more than 50% of the total, including several in which it is more than 75%. These are best described as *hired farmworker* communities because their economies are almost exclusively based on intensive irrigated agricultural production; examples are Firebaugh-

Mendota (Fresno County) in the San Joaquin Valley and Calexico (Imperial County). In these 23 communities, agricultural employment accounts for a plurality of all jobs. Five of these hired farmworker MSSAs (22%) have no primary care physicians. The map in Figure 3 shows where the two types of rural MSSAs are located and their extent.

Many residents in rural MSSAs have no telephone service and thus no means to seek assistance, even in a medical emergency. Telephone service in rural communities is far more limited than is generally recognized. A 1997 study by the California Institute of Rural Studies found that, in 545 rural and nonurbanized California communities, an average of 8.7% of households lacked telephones in 1990.[2] This rate is more than three times the statewide average, 2.8%. Alarmingly, in 49 rural or nonurbanized commun-ities, more than 20% of occupied housing units lacked telephone service.

Lack of telephone service also limits the ability of many to access other needed government services. As unemploy-ment insurance, job services, and other programs come to rely exclusively on telephone call-ins, those without telephones will be completely left out.

Finally, the number of California health facilities relative to population (1990 census) is far more limited in rural than in urban areas. Just in the past year, three rural hospitals closed for financial reasons (Patterson, Atwater, Newhall), leaving their communities entirely without these services and bringing the total of rural hospital closures to nine in the past decade. Two others are reportedly close to shutting down (Coalinga, Sebastopol). Thus, a significant share of the state's 71 rural hospitals closed or were in danger of closing at the end of 1998.

ACCESS TO SERVICES BY THE RURAL WORKING POOR

The ability of the working poor to access health care services is difficult to measure precisely, for two reasons:

1. If people perceive that health care services are unavailable, many do not express a need for those services unless absolutely necessary. Thus, a preponderance of low- income people seek emergency care for serious adverse health conditions that were probably preventable, but they do not seek help earlier because it does not seem to be available.

2. Low-income communities have fewer resources to attract potential providers to work in health service facilities. Thus, low community income, by itself, biases against a high density of health care services, which, in turn, discourages access to care.

To illustrate, the 10 most affluent communities in California (all in urban MSSAs), based on average family income, have an average of 498 residents per primary care physician, about half the state average of all urban MSSAs. In contrast, the 10 poorest communities (all in rural MSSAs), have an average of 3,548 residents per primary care physician, about seven times the number for the most affluent communities and twice the average for all rural MSSAs. Clearly, high average family income significantly enhances a community's ability to attract primary care physicians.

Figure 4 summarizes the number of primary care physicians per 1,000 residents among the various categories of MSSAs: all urban, all rural, 10 richest, 10 poorest, frontier, and hired

farmworker. The gap between all urban and all rural MSSAs is roughly a factor of two, and the gap between all urban and hired farmworker MSSAs is a factor of more than three.

Lack of a primary care physician in a community is a serious barrier to access to health care. The percentages of MSSAs of different types that are lacking a primary care physician are shown in Figure 5. Frontier and all rural MSSAs have very similar shares lacking a primary care physician, while the 10 poorest and hired farmworker MSSAs are clearly experiencing the greatest barriers to care according to this measure.

The most valuable MSSA-based indicator of access to care is the Index of Medical Underservice (IMU), a federally defined numerical index that reflects several important factors in determining access to care. These include the proportion of the population age 65 or older, the fraction of the total population with income below the federal poverty level, the infant mortality rate, and the ratio of primary care physicians to population. These factors are intended to reflect both the demand for health care services and the population's ability to either pay for them or obtain health insurance. The values are weighted, and the sum is the IMU. An MSSA with an IMU of less than 62.0 is potentially eligible for designation as a Medically Underserved Area if certain other conditions are also met.

In this paper the IMU will be used as an indicator of access to care. For California's urban MSSAs, the average IMU value is 83.4, well above the threshold value indicating underserved areas. The average for rural areas is 72.7, 13% lower. This is direct evidence that access to care in most rural areas is more limited than in urban areas.

In California, 58 MSSAs have IMU values below 62.0; 40 of these are rural and only 18 urban. Of the 40 rural MSSAs with IMU values below 62.0, 24 have no primary care physician, while none of the 18 urban MSSAs lacks a physician. The distribution of rural and urban MSSAs with IMU values below 62.0 is shown in Figure 6.

Figure 7 shows the distribution of the 58 potentially medically underserved MSSAs according to their IMU values (all MSSAs with IMUs below 62.0). The five lowest IMU values in the state are found in rural MSSAs: four are hired farmworker communities and one is a frontier community. This suggests that hired farmworker communities are disproportionately represented at the bottom of the health access ladder compared with other rural communities.

The 98 frontier MSSAs have an average IMU of 72.85, nearly identical to the average for all rural MSSAs. The 23 hired farmworker MSSAs have an average IMU of just 61.1, below the 62.0 threshold. This IMU of 61.1 is about 16% lower than the IMU of frontier communities and that of all rural MSSAs. This finding is a direct demonstration that hired farmworker MSSAs have the poorest access to health care services of all California communities. Figure 8 summarizes the IMU values for the different types of MSSAs: all urban, all rural, 10 richest, 10 poorest, frontier, and hired farmworker.

HIRED FARMWORKERS: THE LEAST ACCESS

A *farmworker* is a person who performs tasks on a farm for the purpose of producing an agricultural commodity for sale. Therefore, the definition includes farmers, unpaid family members, and hired workers.

This paper focuses exclusively on *hired farmworkers*, which is an occupational category recognized by the census. It is important to note that the term does not refer to the type of employer doing the hiring, although the literature widely assumes that it is a farmer.

Characteristics of Hired Farmworkers

Recent research enables us to characterize the hired farm workforce of California to an extent that simply was not possible 10 years ago. Research conducted by the National Agricultural Workers Survey (NAWS) of the U.S. Department of Labor, based on more than 1,800 interviews of hired farmworkers in California conducted between October 1, 1994, and October 1, 1997, shows that the characteristics of this population are distinct from those of nearly every other occupational group in the state.[3]

Hired farmworkers are mostly young immigrant males with limited formal education. Although 60% live in poverty, they rarely receive government benefits. Most do not own any assets except for their personal belongings—not even a vehicle. Salient features of the population are described in Table 1.

Table 1

Characteristics of California's Hired Farmworkers

Demographics	
Age	30 years (median)
Gender	82% male
Place of birth	95% foreign-born (91% from Mexico)
Education	6 years (median)
Accompanied by family	45%
Spanish as primary language	95%
English-language fluency	9% speak, 10% read
Literacy skills	24% totally illiterate; additional 43% functionally illiterate
Employment	
Weeks of work per year	23 in farm work, 3 in nonfarm work
Work for farm labor contractor	30%
Payment scheme	73% hourly basis, 24% piece rate, 3% mixed
Average hourly wage	$5.69 per hour ($5.27 per hour if farm labor contractor is employer)
Immigration status	42% unauthorized, 7% citizen, 50% legal permanent resident/temporary resident
Migrant status	57% migrate to seek or perform farm work
Economic status	
Median family income	$5,000–$7,500
Poverty rate (U.S. census definition)	61% (percentage increases with family size)
Social service utilization	18% (primarily WIC [Supplemental Food Program for Women, Infants, and Children] and food stamps)
Assets	21% own no assets of any kind, no vehicle

Source: Howard R. Rosenberg et al., "Who Works on California Farms: Demographic and Employment Findings from the National Agricultural Workers Survey," Agricultural and Natural Resources Publication 21583, Agricultural Personnel Management Program, University of California, Davis, 1998.

Recently, NAWS published a summary report based on national cross-section interviews conducted in 1995.[4] The national profile is quite similar to the data presented in Table 1, except that in other states many more U.S. natives and citizens are farmworkers, and fewer have had previous farm work experience in the United States. Some 37% of the national hired farm workforce was found to be undocumented as of 1995.

Another aspect of the new immigrants that is not summarized in Table 1 is that the U.S.-born component of the population is less diverse and the Mexican and Central American members more diverse than they were a generation earlier. While most hired farmworkers originate from the historically traditional western Mexican states, such as Michoacan and Jalisco, increasing numbers are coming from areas that sent very few migrants in the past, such as the southern-most states of Oaxaca and Chiapas. A large share of new migrants are indigenous people, many of whom prefer to speak their indigenous dialects. Survey research led by Runsten and Zabin enumerated about 50,000 Mixtecs working in California agriculture.[5] Other language groups represented include Zapotec and Triqui.

This diversity presents unusual challenges to employers and host communities. Service providers and educators are faced with assisting people who have completely unfamiliar cultural patterns and may not speak Spanish, even though they are Mexican. Nevertheless, any group of indigenous migrants is likely to include an individual who is fluent in Spanish. For this reason, Spanish is, by far, the language of choice among hired farmworkers. Health care providers who do not speak Spanish have difficulty serving the hired farmworker population adequately, and the task is likely to become harder.

Estimates of the number and distribution of hired farmworkers in California are difficult to make. The most reliable published estimate places the total at about 700,000 individuals.[6] That is, about 700,000 persons perform tasks on farms as hired workers in the course of each year. Annual average hired worker employment, which takes account of the fact that only a portion of this labor force is able to find work in any given week, was reported to be 429,000 in 1997.

Size and Growth of Farmworker Communities

While California agricultural land is shrinking, the acreage devoted to labor-intensive production is rapidly expanding. As a consequence of this and of higher yields for many crops, the production of fruits, vegetables, and ornamental horticultural products (flowers, shrubs, other nursery products) has reached record high levels.[7] In the past 25 years, vegetable annual tonnage has doubled, fruit output has increased by two-fifths, and ornamental crop output has more than doubled. California today has more acres planted to fruit and nut trees, vines, and vegetables than ever before in its history.[8]

Associated with this intensification of farming is the growth of farm income and of net cash return from the sale of agricultural commodities. For example, in 1997 California farm operators received more than $26.8 billion from commodity sales, up 10% from the year before. Sales are increasing at a faster rate than either the state or the federal economy. And the greatest growth in net cash return is in those sectors producing labor-intensive crops.

California's booming agriculture has never been more dependent on foreign-born hired workers than it is today. A generation ago, statewide survey research indicated that about half of California farmworkers were foreign-born.[9] Today, more than 95% were born outside the United States.[10] California's future hired farm labor force will consist nearly entirely of persons born on foreign soil.

A central tenet of public health practice is that socioeconomic status is the single most important factor affecting health status. The fact that more than 60% of all hired farmworkers in California live in poverty implies that adverse health outcomes will be more prevalent in this population than in the general population.

The sharp cutbacks in government benefit programs for low-income people (welfare reform) and the eligibility restrictions imposed on immigrants for these benefits (welfare and immigration reform) have affected farmworker health. Nowhere is the impact clearer than in reduced availability of food stamps and in the proposed reduction in prenatal services. For example, now only children and the elderly are eligible for food stamps among noncitizen immigrants.

Since more than 95% of California farmworkers are of Latino heritage, the dominant cultural practices of that heritage that favor health tend to benefit the hired farmworker population. For example, smoking is far less prevalent among Latinos than among other ethnic groups. Correspondingly, the incidence of cancer and heart disease is quite a bit lower in this population. But in other health outcomes, such as diabetes and homicide, Latinos compare less favorably to other groups. Their death rates from selected diseases, expressed as a percentage of the rate for non-Latino whites, are:

- all cancers, 69% (men) and 61% (women)
- heart disease, 65% (men) and 81% (women)
- respiratory disease, 78% (men) and 109% (women)

Hayes-Bautista and the team of Guendelman and Palerm have studied birth outcomes among successive generations of Mexican immigrant women. Both studies found that recent immigrant women had a lower prevalence of unhealthy birth outcomes and low-birth-weight babies than non-Latino U.S.-born California residents. However, poor birth outcomes are more prevalent among the immigrants' U.S.-born daughters, and even more prevalent among their second-generation granddaughters. Some researchers have suggested that substance abuse (alcohol, tobacco, and drugs) becomes more prevalent among the children and grandchildren of immigrants, contributing to these outcomes.[11]

The diet of Mexican immigrant hired farmworkers has a tendency to deteriorate as a consequence of their employment-determined lifestyle. Ikeda found convincing evidence of this in the food habits of hired farmworker families in Tulare County. She concluded, "The longer Mexican immigrants live in the U.S., the worse their diet becomes."[12]

Stress and mental health problems are among the less-recognized health issues likely to be faced by hired farmworkers. Low socioeconomic status is known to be an important contributor to adverse mental health outcomes.

The prevalence of unaccompanied males in the hired farm workforce contributes to loneliness, depression, and a greater incidence of certain forms of substance abuse, most notably alcohol abuse. The large concentrations of young, active but lonely men who have a weekly paycheck during the season also contributes to the widespread prevalence of prostitution in certain communities, with adverse health outcomes such as sexually transmitted diseases (STDs), including AIDS. Gambling, another source of mental health problems, is known to be prevalent in the all-male subcultures that flourish in various Central Valley communities.

Barriers to Health Care Access

The increased ethnic and linguistic diversity of California's hired farmworker population presents special difficulties to providers of health services. Not only will providers encounter indigenous dialects that may prove extremely difficult to interpret, but also patients may regard Western medical practices with suspicion or simply reject them. Some workers may choose traditional cures because they are less expensive than Western health care services.

Bade has studied the attitudes of immigrant Mixtec women in Madera toward health care.[13] She found conflicts between providers relying exclusively on Western medical practices and the numerous women who preferred traditional, non-Western treatment regimes. Madera is now home to an estimated 5,000 Mixtec immigrants but lacks any Mixteco-speaking health care providers.

Limited access to transportation, since roughly half of California's hired farmworkers do not own a vehicle, presents a serious obstacle to health care access. Efforts of state agencies to screen the hired farmworker population for communicable diseases, such as initiatives taken in the Central Valley by the Tuberculosis Control Branch of the California Department of Health Services, have been severely hampered by the limited transportation resources of this population.

The surprisingly low incidence of vehicle ownership among hired farmworkers has contributed to a remarkable and highly problematic "mini-industry" in the Central Valley: *los raiteros* (a slang term for jitney drivers). Many hired farmworkers now travel to and from work in panel vans driven by *mayordomos* or their assistants. Frequently, not only are workers charged exorbitant fees, typically $3 to $5 per day, but many also find that paying for a ride in the van is a de facto condition of employment, even though it is a violation of U.S. labor law. During 1995–1996, 29 hired farmworkers were killed in multiple-fatality vehicle accidents involving *raitero*-driven vans or pickup trucks in Fresno and Madera counties alone.

The literature contains remarkably few statewide findings on the general health status of hired farmworkers or their families. Most reports either are essentially anecdotal, such as summaries of case reports from migrant health clinics and summaries of intake forms from local health fairs, or are single-community case studies.

Results of Research and Primary Surveys

No statewide survey of the health status of hired farmworkers appears in the literature.[14] One study reports on the health status of a large number of Tulare County hired farmworkers and their families, but it relies exclusively on self-reported information.[15]

The literature does contain two single-community case studies of towns populated mostly by hired farmworkers and their families in which both self-reports and objective physical examinations were obtained. The largest of these is the McFarland Child Health Screening Survey, in which the DHS attempted to screen every child in the community between the ages of 1 and 12.[16] This effort was prompted by an unusually high incidence of cancer among children in the community (eight times higher than expected). The second study was a pilot cross-sectional survey of the entire adult population of Parlier.[17]

In the McFarland case study, 1,697 children were screened, an estimated 90% of the eligible population. While no additional cases of childhood cancer were found, the results of the physical examinations were extremely disturbing: 71% of the children required a medical

referral to treat one or more adverse health conditions. The greatest number needed vision care (40%), dental care (37%), and treatment for anemia (24%). Among children under age 4, 15% of were referred because of incomplete immunizations or inadequate immunization information. Half of the children over age 5 had never seen a dentist. Half of the children had not had timely physical examinations, and 8% had never had any physical examination.

In McFarland, 46% of all families and 64% of monolingual Spanish-speaking families had no health insurance coverage. Only 32% of families had private health insurance, while 22% had Medi-Cal. In a multivariate analysis of the McFarland data, Smith and her colleagues[18] reported that specific unmet health services were linked with particular aspects of demand:

- Lack of dental care was linked with low income, no health insurance, lack of transportation, and lack of child care.
- Lack of physical exams was linked with older age, perception that the child had poor health, Medi-Cal coverage, and lack of transportation.
- Lack of prenatal care in the first trimester was linked with low income, larger households, lack of transportation, and low levels of education.
- Referral to a doctor for medical care was linked with older age of the child and lack of transportation.
- No usual source of care was linked with older age of the child, Medi-Cal or lack of health insurance, low income, and monolingual Spanish speakers.

Either low income or lack of health insurance affected every unmet need except referral of the child to a doctor, indicating a problem with access to care. Medi-Cal families had the lowest incomes and the sickest children, which may indicate that families obtained Medi-Cal coverage only when their children became ill.

The Smith team concluded that economic demand for health care services in McFarland, based on ability to pay, was insufficient to support the number of private-sector physicians the community needed. Based on existing models of physician-to-patient ratios, the community needed at least four full-time-equivalent physicians but had sufficient discretionary income to support only one. Not surprisingly, the town has just one private- sector physician. Although it does have a publicly supported migrant clinic, just one in six families had ever sought care there.

The findings also suggest that underutilization of health care services is associated with lower levels of education. Thus, the morbidity rate could be lowered if culturally appropriate health education and outreach facilitated access to care.

In contrast, the Parlier Health Survey sought to study a cross-section of the adult population of Parlier, a city of 10,000 residents located 20 miles southeast of Fresno.[19] Absence of health insurance, dental care, and vision care was found to be prevalent, as in McFarland. The self-reported health status of the adult hired farmworkers was quite good, in contrast to the findings among the children of McFarland. Most reported that they were in excellent condition, which was supported by the results of their physical examinations. Few had specific complaints concerning their health status, although a number had cases of obesity and hypertension. About 10% had complaints of hay fever or allergies. About 20% had persistent back or musculoskeletal pain but did not regard it as sufficiently serious to miss work. Some 17% said they were exposed to pesticides at work. About 90% said that they had no physical impairment of any kind. In most respects, the Parlier Health Survey results mirror the findings of the

Hispanic Health and Nutrition Survey, a subset of a national survey of U.S. adults conducted by the Centers for Disease Control.

As in McFarland, in Parlier most adults (61%) lacked any form of health insurance, while 14% had Medi-Cal, and the remaining 25% had private health insurance. Relatively few adults sought health care services at the Parlier migrant clinic (fewer than one in six). Parlier had just one private physician and one OD, but it is relatively close to Fresno, a major metropolitan area with a county-supported hospital. Nevertheless, 5% of Parlier adults had never been to a health professional in their lives.

Mines and Kearney studied hired farmworker families in Tulare County using ethnographic survey methods.[20] Their findings suggest a somewhat different profile of the health status of farmworkers than the Parlier Health Survey or McFarland Child Health Screening Survey reported. First, the most prevalent health problems reported were headaches and nervousness. This was followed by dental problems, skin irritations, respiratory problems, and musculoskeletal problems.

Similar to the findings in McFarland and Parlier, 42% of the Tulare County sample had never been to a dentist, and 60% had never been to an eye doctor. Doctor visits were about one-third lower among Tulare County hired farmworkers than for the nation as a whole. Of women who had completed pregnancies since 1970, 18% had had no prenatal exam and 54% had not had a prenatal exam during the first trimester. Asked why, 46% of these women responded that such an exam was unnecessary, but 35% said it would have cost too much.

Cultural practices among Mexican immigrants in many cases led to very different ways of attending to health from "normal" practices in the United States. For example, Mexican women do not normally seek the services of a physician during the early months of pregnancy, instead relying on the services of a *partera* (midwife). Similarly, the preferred first step in attending to a health complaint is often application of salves and ointments or use of herbal remedies recommended by a *curandera* or *curandero* (traditional healer).

For this reason outreach programs involving community-based lay health advisors have proved among the most effective means of educating hired farmworkers and delivering certain types of health services to them. Bringing health care information and screening services to workers and their families in a culturally appropriate manner may prove far more effective than relying on them to find and go to a service provider.

Problems with Communicable Diseases

A major outbreak of unexpected communicable diseases occurred in rural and agricultural areas of California in recent years. Hired farmworkers appear to have been disproportionately afflicted. Widely reported was the measles outbreak in 1989–1990. Despite the lack of occupational data in the case reports, a high prevalence among hired farmworker families caused the California Farm Bureau Federation to encourage its members to strongly urge their hired workers to obtain proper vaccinations. In a feature story on the epidemic in the Farm Bureau newspaper *Ag Alert*, the lead paragraph described three adult Glenn County farmworkers who sought treatment for persistent high fever, dizziness, and blotchy skin; they had measles.

The story was just one of hundreds occurring in rural or agricultural centers of the state. In all, 12,719 cases were reported, including 327 in Fresno County; 33 children died from the disease.

By contrast, in 1981 only 321 cases of measles occurred in all of California, and no child had died of it from 1982 through 1987.

In an editorial titled "The Unnecessary Epidemic," the *Fresno Bee* commented that the entire outbreak could have been prevented by adequate immunization. According to the editorial, in Fresno County 30% of all children and 50% of minority children had not been immunized by age 2.[21]

Occupational Safety and Health Problems

Agriculture is the nation's most dangerous industry, according to occupational mortality reports compiled by the National Safety Council (NSC).[22] The incidence of occupational fatalities for U.S. agriculture was determined by the NSC to be 35 per 100,000 workers in 1993, exceeding the rates for construction and mining. This rate includes all types of farmworkers—farmers, unpaid family members, and hired farmworkers; no figures are available for hired farmworkers alone. Data from other sources confirm the high rate of fatalities: between 660 and 1,100 deaths per year occur in U.S. agriculture as a direct result of occupational hazards.

Within California, more specific figures are available. In 1994, 47 hired farmworkers died from on-the-job injuries. Their occupational mortality rate was 17 per 100,000 workers in 1994, more than three times greater than the rates for all other private-sector industries except construction.

Nonfatal injuries also occurred at a much higher rate among hired farmworkers in California than for other private-sector industries except construction. In 1994, 34,214 cases of occupational injury among hired farmworkers resulted in a paid workers' compensation insurance claim. This corresponds to an incidence rate of approximately 10,000 per 100,000 full-time-equivalent workers. In other words, one in ten hired farmworkers suffered an on-the-job injury that resulted in workers' compensation. About half of these injuries were serious enough to disable the employee, in most cases only temporarily. In contrast, the California Department of Industrial Relations reports that manufacturing workers in the state had about 7,500 injuries per 100,000 workers.

These reported agricultural injuries were quite serious, requiring an average of eight days off-the-job for the worker to recover. The most frequent cause was overexertion, followed next by being "struck by or against" an object (machine, tree, vines, tool, or the like). Chemical agents, such as pesticides or fertilizers, were responsible for about 1.5% of reported occupational injuries in agriculture and about 2% of all disabling injuries. There is compelling evidence that reported injuries caused by chemical agents have declined substantially in agriculture in recent years.

An important and difficult question is whether all injuries are reported to authorities and enumerated in the summary data we have reviewed. Substantial anecdotal evidence indicates that underreporting does occur and that the amount may be large. Reasons for it include the high and rising number of undocumented workers, employers who discourage claims, fear of losing the job, and the worker's protection of a foreman or supervisor who is a relative.

The anecdotal evidence suggests that many hired farmworkers fear retribution by their employer if they file an employment-related complaint with governmental or other authorities. In some instances, a worker may have personal obligations to the labor contractor. In other cases,

the worker may be undocumented and fearful of deportation, or may be ignorant of the requirements of California workers' compensation law.

There is also evidence that the vaunted workers' compensation system is not serving farmworkers very well. Recent changes in workers' compensation law have adversely affected hired farmworkers as well as other persons who work at seasonal jobs and are injured on the job. Instead of using the previous week's earnings to compute indemnity payments, the fraction of the year during which the injured worker was employed by that specific employer is now used to determine the amount of the payment. Because farm work is seasonal, injured workers who may work for a specific employer for only a few weeks and then find a farm job with another employer are receiving indemnity payments as low as $6. Low indemnity payments, in turn, discourage other workers from filing claims.

Labor and Safety Laws in California Agriculture

Enforcement of the labor and safety laws has proved an effective tool to improve the health status of hired workers. In recent years, the Mine Safety Act revolutionized conditions in the nation's coal mines and led to a dramatic decrease in occupational fatalities and injuries. Today, coal mining is safer than agriculture, though the opposite was true before enactment of the law.

California law sets fairly strict requirements for agriculture. For example, field sanitation standards were in place in the state long before they were adopted nationwide. Similarly, the Agricultural Labor Relations Act provides protections for workers that are more generous than those in any other state. State minimum wage, workers' compensation insurance, unemployment insurance, and antidiscrimination laws provide universal protection to virtually every California farmworker.

At the same time, enforcement of labor and safety laws in the state is widely reported to be relatively weak. In large part this appears to be due to limited resources, a consequence of policy at the highest level of state and federal governments. For example, none of the 300 Cal-OSHA compliance officers is assigned to agriculture. Only four staff members from the U.S. Department of Labor (Wage and Hour Division) work in the Central Valley, and they must cover all industries, not just agriculture. The State Labor Commissioner (Division of Labor Standards Enforcement) has just five staff members regularly assigned to agriculture, and only one Spanish-speaking law enforcement officer. Pesticide safety enforcement is conducted by county agricultural commissioners, who have been traditionally aligned with farm operators in promoting their county's farm industry.

Despite these weaknesses some improvement has occurred over the past five years in safety and labor law enforcement in California agriculture. The Targeted Industries Partnership Program (TIPP), initiated in late 1992 as a joint enforcement and employer education effort of the State Labor Commissioner (Division of Labor Standards Enforcement), the U.S. Department of Labor (Wage and Hour Division), Cal-OSHA, and the state Department of Employment Development, focused on agriculture and the garment industry. Analysis of TIPP records of citations issued and fines levied for the first two and one-half years demonstrated that the program was effective.[23] The analysis also showed which industries, regions, and types of employers were most likely to be noncompliant, so that TIPP staff could pinpoint potential violators.

In the past several years, however, TIPP inspections in agriculture have fallen to very much lower levels. It is not clear whether this is due to a lack of consistent leadership— three labor commissioners in the past two years—or to a conscious decision to focus resources in other industries.

Health Insurance Problems

There is a paucity of information about the health insurance coverage of hired farmworkers. Nationwide, the insurance industry estimates that 40% lack health insurance, a higher proportion than in any other occupation. However, careful review shows that this figure includes only regular, year-round employees. Industry sources do not provide data for those who are seasonally employed.

The National Agricultural Workers Survey (NAWS) found that 32% of California's hired farmworkers have some form of health insurance through their employer. However, since some workers may confuse workers' compensation insurance, which provides fully paid medical care for job-related illness or injury, with health insurance, which covers conditions that are not job-related as well, the figure may be unreliable.

Surveys of employers conducted by the Farm Employers Labor Service indicate that about 60% of employers provide health insurance for their regular, year-round employees but only about 13% provide it for seasonal employees.

Taken together, the data on farm operators and farm labor contractors suggest that few seasonal farmworkers enjoy health insurance provided by the employer. As a consequence, many simply do without health care, apply for Medi-Cal coverage, go to migrant clinics, or use emergency services. Though the evidence is not comprehensive, it appears that most hired farmworkers do without regular health care and seek services only when absolutely necessary.

Farmworker Housing: A Health Issue

Compelling evidence shows a serious deterioration in the quality of housing available to hired farmworkers in California. This change is a direct result of both the great increase in the supply of farmworkers and laws regarded as onerous by many employers.

Historically, farm operators offered housing, often subsidized by the employer, as an incentive to retain workers for subsequent seasons. Because a substantial surplus of agricultural labor is now available, many farm operators have concluded that this incentive is no longer important. Moreover, laws enacted during the 1970s required farm operators to meet housing quality standards that the operators found objectionable or too expensive. In addition, if an operator provides housing on the farm, workers' compensation law applies 24 hours a day, potentially increasing the premium cost greatly should an accident occur after work hours.
During the past 20 years the amount of housing supplied by farm operators has diminished drastically. Tens of thousands of units have been demolished, sold, or abandoned. Relatively few farmworkers now reside in such units. Since California is a notoriously high-rent state, large groups of workers often crowd into housing units intended for single families. Workers have also established informal encampments in the canyons and *arroyos* of some of our wealthiest coastal communities. And thousands of workers manage to find unofficial homes in unlikely places.

During 1992, the California Institute of Rural Studies and the UC Davis Department of Epidemiology and Community Medicine conducted the Parlier Health Survey, a thorough study

of the rural community of Parlier.[24] An unusual feature of the survey was a major effort to identify every single place where people were actually living, instead of limiting the survey to residents of officially recognized dwelling units. Individuals were found living in toolsheds, garages, informal shacks constructed of plywood or sheet metal, abandoned automobiles, and even the spaces underneath porches. Altogether, these "back houses" (so-called because they were generally located in backyards of regular residences) were inhabited by 28% of the residents. Virtually all of these residents are not enumerated by the census, both because they lack a postal address, which is needed for the census forms that are mailed, and because their landlords prefer that they remain invisible.

Generally, overcrowded conditions (more persons in fewer rooms) characterize the back houses of Parlier. In some cases, a garden hose was the only source of water and a chamber pot was the only toilet. A normal rental was $25 per person per week, paid in cash.

The most surprising finding of the Parlier Health Survey, in terms of housing conditions, was that about 60% of back-house residents lived there year-round. This was contrary to anecdotal information provided by local officials, who asserted that this type of housing was "temporary," accommodating seasonal migrants.

The number of persons residing in such housing statewide is not accurately known, and the Parlier Health Survey itself was only a pilot for a larger household survey of seven more hired farmworker communities. However, the large difference between the findings of the 1990 Census of Population and Housing in Parlier and those of the Parlier Health Survey at least partially explains the enormous discrepancy between the 1990 census finding of 175,000 hired farmworkers in California and the "best estimate" of ethnographers and economists of some 700,000.

Stricter immigration enforcement by the border patrol, designed to exclude undocumented workers, has contributed to an opinion among many Mexican migrants that returning to Mexico for family visits or holiday periods is simply too costly and risky. As a consequence, immigration experts have concluded that Mexican migrants are now more likely to reside in California year-round. This factor increases the pressure on the housing supply.

One of the difficult issues facing hired farmworkers is that present-day housing policy tends to favor the nuclear family model. Public labor camps do not provide housing for either groups of unaccompanied men or large extended family households, nor are non-nuclear, extended families eligible for other nonprofit low-income housing projects. This particularly affects Mexican migrants, whose household norm includes extended families who in some cases are bi-national, with wage earners on both sides of the border contributing to the support of all members.

Thus, California desperately needs housing initiatives that are geared more accurately to the nature and composition of the immigrant labor force in agriculture. Housing must be appropriate for groups of unaccompanied male workers and for large, multigeneration extended families. Modest planning initiatives designed for groups of unaccompanied male workers have been undertaken by Professor Patricia Harrison, of the UC Davis Environmental Horticulture Department, in conjunction with staff members of the Cooperative Extension Service. No new units have yet been built, although detailed construction plans are now available.

The decline in housing stock for hired farmworkers may also be associated with a deterioration in the quality of drinking water. As fewer farm operators provide housing, the "back houses" of Parlier are becoming the norm. Ironically, because these units are unofficial, they are not regularly inspected by health authorities.

In 1991, the U.S. Environmental Protection Agency (EPA) found that 191 agricultural labor camps in California were in violation of the nation's Safe Drinking Water Act. Water supplies are subject to federal drinking water standards if piped water is provided to at least 25 people or 15 service connections for at least 60 days per year.

"EPA's discovery that a large number of migrant labor camps are providing potentially unhealthy water is appalling," said Daniel W. McGovern, EPA's regional administrator. The largest numbers of noncompliant camps were found in Fresno County (52), San Joaquin County (32), and Merced County (24). A surprising finding was that many workers live in these "migrant camps" year-round. According to EPA administrators, county officials stated that many camp owners closed their camps rather than comply with the law, exacerbating the housing problem.

Evidence also exists that state officials have reduced the number and frequency of tests of private drinking wells. Under state law, Cal-EPA is required to test wells for pesticide contaminants. In the most recent several years, a reduced number of pesticide contaminants have been tested for and fewer sites have been tested.

FEDERAL HEALTH POLICY AND RURAL CALIFORNIA

Federal health policy toward rural America is based on providing supplementary resources to designated rural areas. Congress and a series of presidents have appreciated the degree to which health care access is a problem in many rural areas. Resources provided to rural hospitals have been especially important.

California has benefited from some of these resources. But the state's demographic trends and federal definitions of rural areas have worked to the selective disadvantage of rural residents. Today, only half of the hospitals in California's rural MSSAs qualify for federal support under the federal definition.

Federal health policy has been driven mostly by demographic measures that classify entire counties as rural or nonrural according to whether the county contains a designated metropolitan area. This approach has significant consequences for some rural Californians.

The recent literature on rural America posits that rural is equivalent to nonmetropolitan, especially when classifying places. Dudenhefer, in referring to the work of the Task Force on Persistent Rural Poverty of the Rural Sociological Society, states categorically, "By rural, they mean counties classified by the U.S. Census Bureau as 'non-metropolitan'; generally speaking, these are counties in which the largest city contains less than 50,000 people and the inhabitants do not commute to an urban center. The Task Force uses 'rural' and 'non-metropolitan' interchangeably, as does this article."[25]

Using this classification criterion, all the nation's approximately 3,000 counties can be classified as either metropolitan or nonmetropolitan. Roughly speaking, if a county includes a place with

at least 50,000 persons or has a sizable number of persons commuting to such an urban center, it is defined as a metropolitan county; otherwise, it is nonmetropolitan.

Under the federal definition, rural places have a much smaller population: they are places with a population of fewer than 2,500 located in nonurbanized areas. Rural places are identified within counties, and an entire county may be rural if all the places within it are rural. Note carefully that a nonmetropolitan county may contain places of intermediate population (from 2,500 up to 49,999). A nonmetropolitan county may even be composed largely of nonrural people.

The most remarkable feature of this scheme is the absence of the rural classification from the most important agricultural areas of the west. Nearly all of the San Joaquin Valley (California) and most of the Yakima Valley (Washington) are classified as metropolitan, as are Yuma and Maricopa counties (Arizona).

Within California, 33 of the state's 58 counties are now classified as metropolitan, and, as population growth continues, several more rural counties are likely to be designated as metropolitan after the 2000 census. With a stroke of the federal pen, all of the rural residents of these counties are now considered urban residents, *despite the fact that the federal census found them to be genuinely rural residents by its own criterion.* This obvious contradiction has affected 1.6 million rural Californians, out of the total of 2.2 million, by reclassifying them as metropolitan county residents for many federal policy purposes.

On the basis of this county definition, federal officials and some scholars find that there are remarkably few persons in rural poverty in California. Summers goes even further, omitting reference to the nonmetropolitan classification scheme at the county level, when he states: "In 1990 there were slightly over 9 million rural residents of the United States who were poor . . . and Hispanics made up only 5.4% of the total."[26] By simple wordsmithing, absolutely no rural persons are found to be living in poverty in all of Fresno, Kern, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties. This line of reasoning implies that, at most, only 486,000 rural Hispanics were living in poverty in the entire United States. Similarly, only 751,667 nonmetropolitan Hispanics were found in all the 11 western states, of whom just 226,659 were poor.[27]

On its face, equating *rural* with *nonmetropolitan* appears to make sense: major metropolitan centers do not contain rural residents. While the equivalence of rural and nonmetropolitan at the county level appears to be supported by a body of evidence, the simple application of this equivalence is fundamentally inaccurate in major parts of the west.

The shortcoming of the rural/nonmetropolitan equivalence is illustrated in Table 2, which shows the 1990 census population-enumerations for the state total, rural, rural in metropolitan counties, and rural in nonmetropolitan counties in California and Washington. What is most striking is that a majority of the census-enumerated rural population resides in *metropolitan* counties. In California, *three-quarters of the rural population is in metropolitan counties* and only one-quarter in nonmetropolitan counties. Figure 9 summarizes the distribution of the genuinely rural residents of the state according to this metro/nonmetro classification scheme, and Figure 10 shows the distribution of the rural Hispanic population according to the scheme.

Sorting counties using a single characteristic (metropolitan/nonmetropolitan) as a surrogate for urban/rural is clearly not helpful. That this classification scheme breaks down so completely

Table 2

Rural Metropolitan and Nonmetropolitan Populations of California and Washington, 1990 Census

State	Total Population	Rural Population	Rural Population Metro Counties	Rural Population in Nonmetro Counties
California	29,760,021	2,188,143	1,662,691	525,452
Washington	4,866,692	1,149,568	593,597	555,971

when applied to the two western states with the largest share of the rural population calls it into serious question.

The metropolitan/nonmetropolitan classification of counties is useful because it represents rural places based on county boundaries, which are familiar to most policymakers. To represent rural areas more accurately would require analysis within counties, dividing many metropolitan counties, such as those of the San Joaquin Valley, into rural and urbanized portions.

This is why the MSSA designations are so useful: they are a scheme for population analysis within counties that takes into account the very large size of many counties in the west. For example, San Bernardino County comprises more than 12 million acres, the size of New Hampshire and Vermont combined. Those two eastern states have a total of 24 counties; interestingly, the number of assigned MSSAs in San Bernardino County is also 24. Thus, the MSSAs of California are roughly the same size as the small counties of the east.

California's use of the rural MSSA designation to determine available medical services can provide valuable information for federal health care policymakers. If the U.S. government were to adopt new guidelines based on MSSAs, significant rural portions of metropolitan counties might receive federal funds that were intended to serve rural communities but are now limited to nonmetropolitan counties.

CONCLUSIONS

1. On average, rural California communities experience poorer access to health care services than urban California communities do. This is a result of fewer primary care physicians per resident as well as a low and declining number of rural hospitals.

2. There are two principal types of rural communities in California: *frontier* communities based on natural resource economies and not on intensive irrigated agriculture; and *hired farmworker* communities with economies based nearly exclusively on intensive irrigated agriculture. The two are distinguished by very different levels of Latino population: fewer than 12% of the population of each frontier community and more than 50% of the population of hired farmworker communities.

3. Among rural communities, the very poorest access to health care is found in *hired farmworker* communities.

4. Federal definitions of rural areas are contradictory and disadvantage rural residents of the west, especially rural Latinos. This disadvantage arises from the federal designation of counties as either metropolitan or nonmetropolitan, regardless of the size of the rural population in the county.

5. California designations of rural and urban Medical Service Study Areas within counties are a useful and informative method to classify rural and urban communities.

RECOMMENDATIONS

1. Promote settlement of migrant workers, especially unaccompanied males, by developing suitable housing. The major decrease of employer-provided housing has left many workers homeless, resulting in a dramatic increase in the number living in unhealthful or substandard units. Present-day housing programs for hired farmworkers are based on the nuclear family model, ignoring the fact that most workers live in either extended family households or households of unaccompanied males.

2. Cooperate with the just-organized census initiative to completely enumerate hired farmworkers for the 2000 census. The likely allocation of additional federal resources alone fully justifies the proposed effort.

3. Place 50–100 public health nurses with continuation education in occupational and preventive medicine in hired farmworker communities, and assist them with a cadre of *promotores de salud* in each site. Their initial tasks should focus on specific priority areas, such as communicable diseases, immunization, health care for undocumented workers, safety and labor law enforcement, and health education.

4. Conduct a statewide needs assessment using proper scientific protocols for the hired farmworker population. Such an evaluation has never been implemented even crudely. This is the essential first step of any intervention program. Without baseline data, we cannot prioritize interventions properly or measure the effectiveness of those that are implemented.

5. Initiate independent and rigorous peer-review evaluation of the existing intervention programs by public and private agencies that are intended to serve hired farmworkers and their families. Millions of dollars are spent on programs such as job training, migrant education, migrant health, legal services, and migrant Head Start, but they are rarely evaluated in a rigorous scientific manner by independent peers.

6. Collaborate with the efforts of Meyers/Miles/Faucett at the University of California to focus on back and musculoskeletal injury prevention in the farm workplace. This combined group of public health specialists and agricultural engineers is unique and has already produced significant improvements in the nursery crop industry.[28]

7. Carefully analyze the experience of hired farmworkers in light of major changes in workers' compensation law. Some of these changes appear to have had a substantial negative influence on claim payments to injured seasonal workers.

8. Strengthen efforts to change federal health policy guidelines for designations of rural areas, and allocate resources to support this effort. The costs will be more than offset by the additional resources the federal government will then provide to rural health care facilities in California. Moreover, unless such an effort is mounted, the state will very likely lose federal resources for some of its remaining rural hospitals in the wake of the 2000 census.

9. Document the number of allied health professionals available in rural areas—dentists, vision care providers, nurses, specialty physicians, and so forth.

Figure 1. California Rural and Urban Population Percentages (1990 Census)

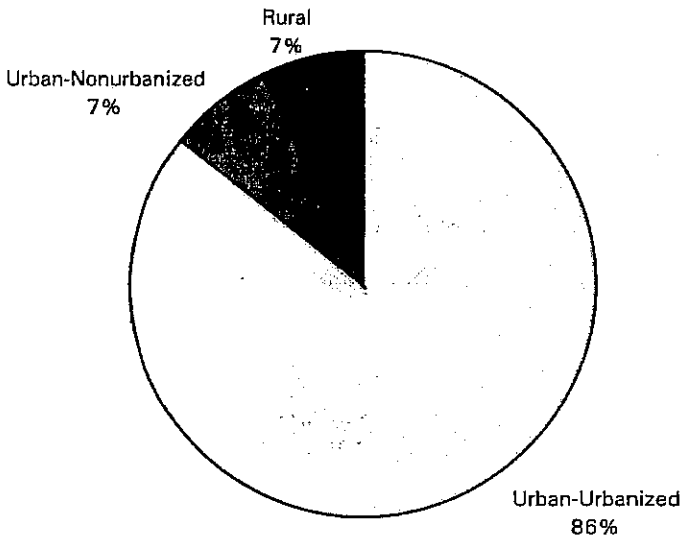


Figure 2. Rural and Urban Population Shares by RHPC Definitions (1990 Census)

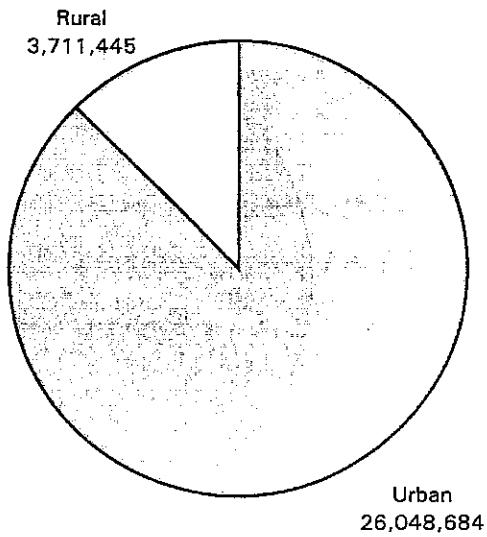
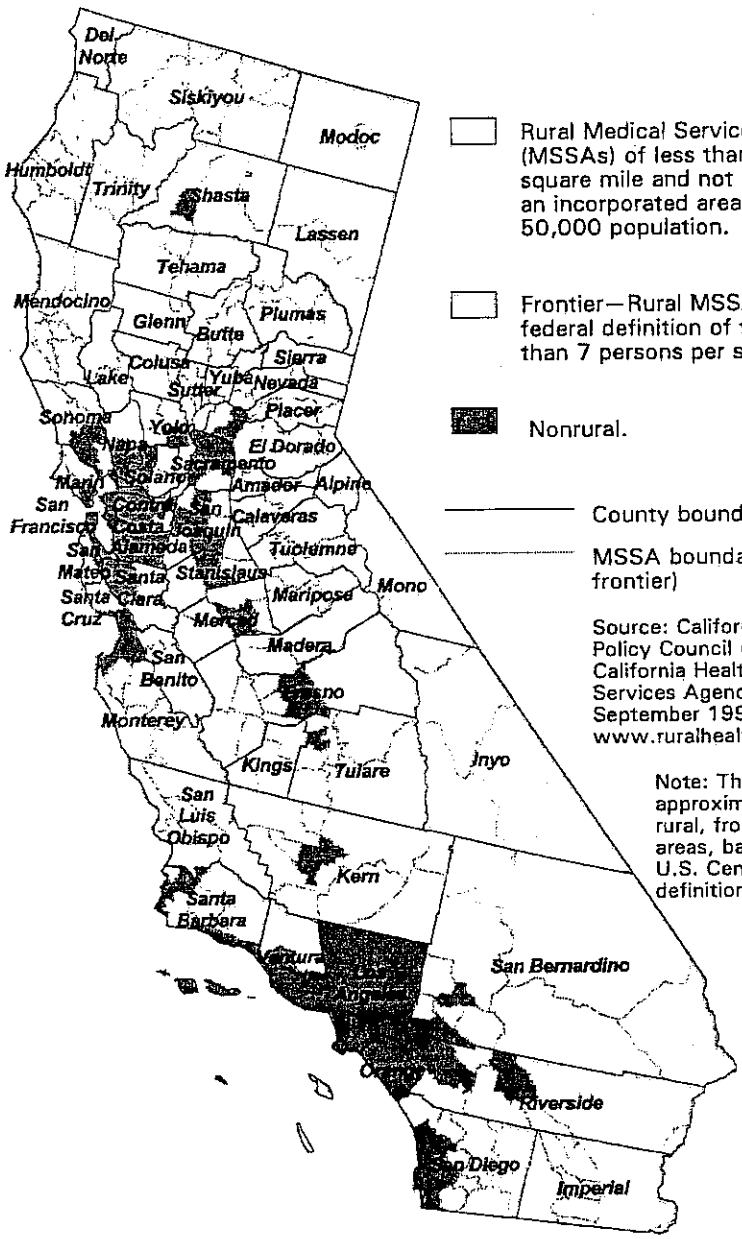


Figure 3. Rural and Frontier Medical Service Study Areas



Rural Medical Service Study Areas (MSSAs) of less than 250 persons per square mile and not wholly containing an incorporated area of greater than 50,000 population.

Frontier—Rural MSSAs using the federal definition of frontier (fewer than 7 persons per square mile).

Nonrural.

County boundaries

MSSA boundaries (rural and frontier)

Source: California Rural Health Policy Council (RHPC), California Health and Human Services Agency, Sacramento, September 1999. See http://www.ruralhealth.ca.gov.

Note: This map is an approximation of California's rural, frontier, and nonrural areas, based on the 1990 U.S. Census and the RHPC definition of rural.

Figure 4. Primary Care Physicians per 1,000 Residents in California MSSAs

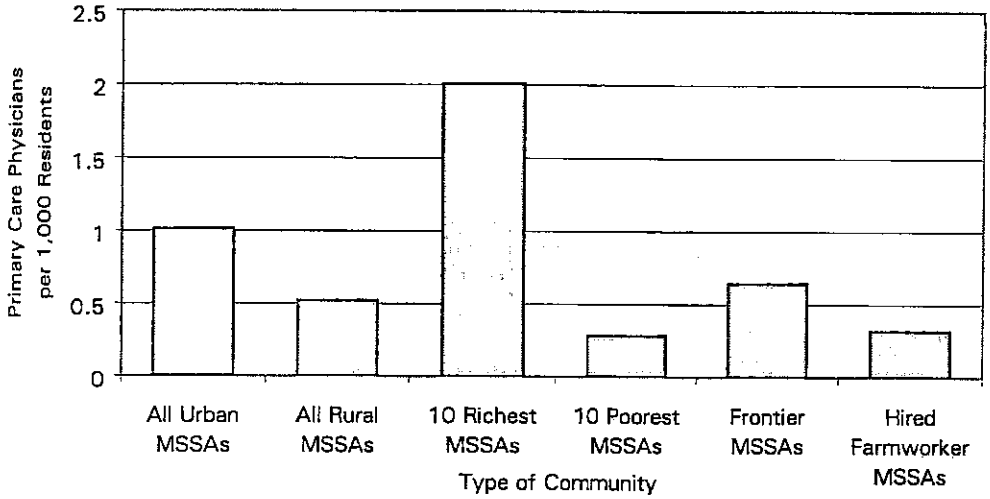


Figure 5. MSSAs Lacking Any Primary Care Physician

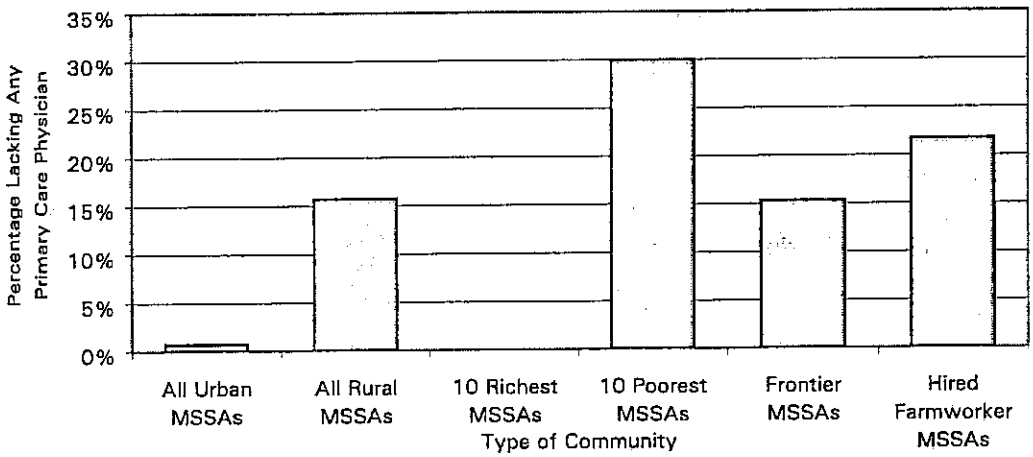


Figure 6. Proportion of Rural and Urban MSSAs Below IMU Threshold (Possibly Medically Underserved)

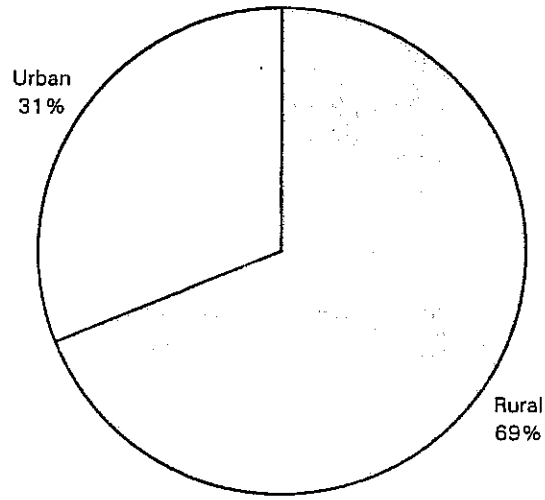


Figure 7. IMU Values of Medically Underserved Rural and Urban Areas

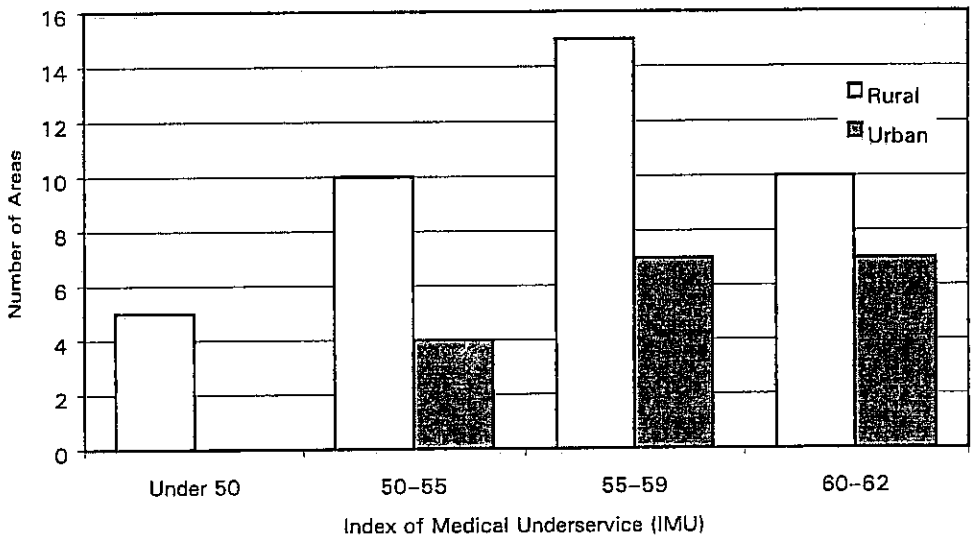


Figure 8. Average IMU Values in California MSSA Categories

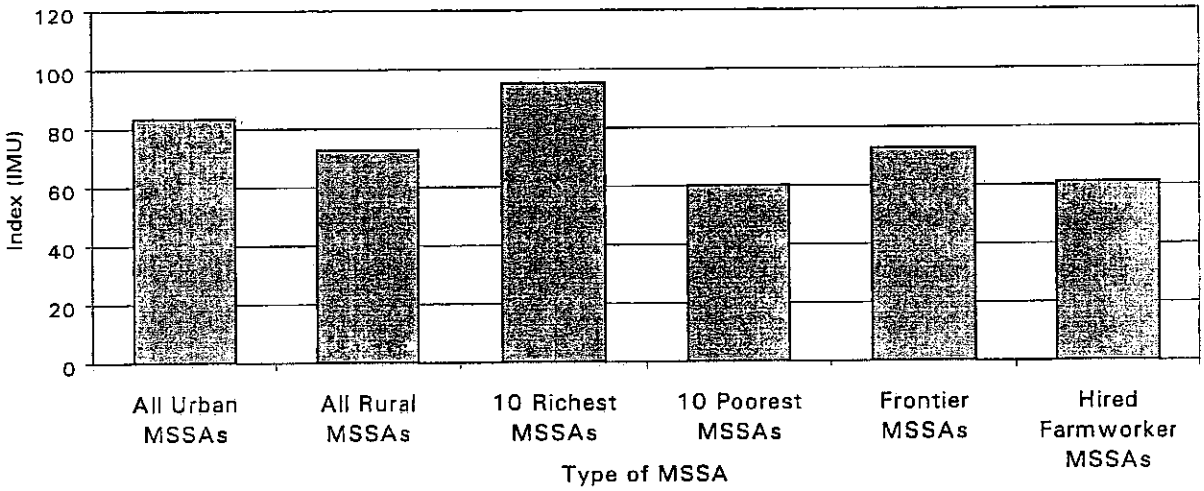


Figure 9. California Rural Population in Metro and Nonmetro Counties (1990 Census)

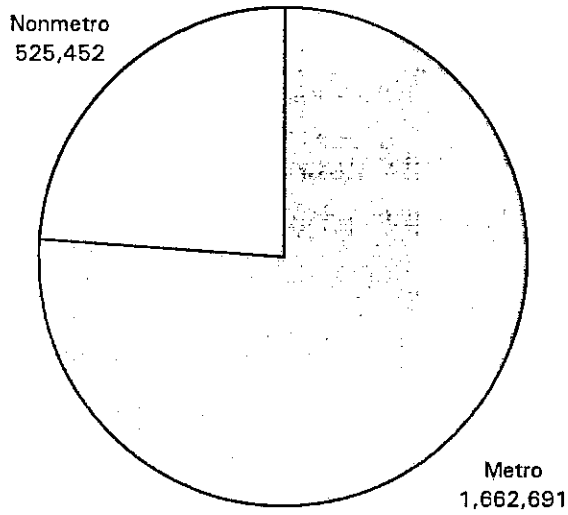
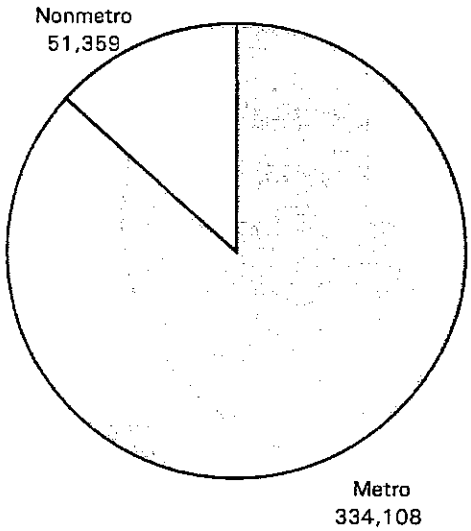


Figure 10. Rural Hispanic Population, in Metro and Nonmetro Counties, California (1990 Census)



NOTES

1. RHPC actually classified 208 as rural. However, two MSSAs characterized by RHPC as nonrural actually should have been classified as rural: Brawley and surrounding portions of Imperial County, and the Planada-Le Grand area of Merced County. Thus, the total of rural MSSAs is 210.

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11. Professor Juan Vicente Palerm (Director, UC MEXUS, Riverside), private communication, October 1997.

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19. Sherman et al., op cit.

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21. Editorial, *Fresno Bee*, n.d.

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