

Environmental Health Policy and California's Farm Labor Housing

by

Don Villarejo, Ph.D.
Marc Schenker, MD, MPH

A Report Prepared for the
John Muir Institute on the Environment
University of California, Davis

October 1, 2006

Abstract

While the demand for hired farm workers has substantially increased in recent decades, the supply of employer-provided housing for hired farm workers has sharply declined. In the face of skyrocketing housing costs in California, workers are increasingly forced to rely on their own meager resources to obtain housing. Government agencies and researchers are in general agreement that a great many of the state's hired farm workers have little choice but to reside in sub-standard and/or overcrowded units, including garages, sheds, barns and temporary structures. The National Agricultural Workers Survey (NAWS) finds that California's crop farm laborers are mostly young, married, foreign-born (nearly all Mexican), low-income, Spanish-speaking men with low educational attainment who do not migrate to find work. The California Agricultural Workers Health Survey (CAWHS) finds nearly half (48%) of dwellings occupied by the state's hired farm workers are overcrowded and a quarter (25%) extremely overcrowded. Nearly one-third (30%) of CAWHS dwellings are not recognized by the local County Assessor or by the U.S. Postal Service. Many of these dwellings are irregular structures not intended for human habitation, and one-sixth (17%) lack either plumbing or food preparation facilities, or both. While there are a number of reports in the literature of adverse health outcomes or potentially hazardous environmental exposures associated with farm labor housing conditions, only a very few suggest a direct link between health status and sub-standard or overcrowded conditions. Among these are gastro-intestinal illnesses associated with the lack of a refrigerator and significantly elevated levels of anxiety and depression associated with poor living conditions. Large numbers of unrelated immigrant workers residing together is a risk factor for the spread of infectious diseases that likely originate in the sending countries, such as tuberculosis, parasite infections and malaria. The paper concludes with a series of policy recommendations, including:

- Initiate substantial new research on the supply and status of farm labor housing, especially to determine the extent of health hazards;
- Enhance California's public health workforce, with special attention to hired farm workers;
- Strengthen enforcement of health standards for farm labor housing;
- Address the housing shortfall for this population through state-mandated shortcuts for obtaining local approval for construction;
- Create positive incentives to local authorities to meet farm labor housing needs by granting indirect preferences for bond funds to improve local infrastructure;
- Establish a permanent funding source to increase the supply of safe and affordable housing for farm laborers;
- Oppose the use of housing vouchers in any existing or proposed guest worker program;
- Make clear that public funds shall not be made available to farm employers who wish to provide housing for their employees.

Introduction and background

California's farm laborers have increasingly been required to rely on their own resources to find suitable housing in a state where costs for shelter have skyrocketed. Over the course of the past thirty years, many agricultural employers, both farmers and labor contractors, have torn down or abandoned thousands of housing units that were once provided to migrant workers [Peck, 1989]. One estimate suggests that of approximately 5,000 seasonal housing units that existed in 1968, fewer than 1,100 units remained in 1988 [California. Senate Committee, "Farmworker Housing: Background Paper," p. 3, 1995]. Farmers complain that the cost of meeting increasingly stringent standards is simply uneconomical and that state requirements conflict with federal standards, while advocates argue that state law requires that housing for farm laborers meet the minimal standard of decency set by the Employee Housing Act [California. Senate Committee, "Farmworker Housing: Summary Report," 1995]. In any event, fewer farm employers provide seasonal housing today and fewer units are available.

Of concern in this context is the extent to which some workers believe they have little choice except to build squatter shacks, sometimes on environmentally sensitive public land. Consider the following case: surrounding the lagoons of the northern San Diego County coast are substantial areas overgrown with vegetation that have become notorious for confrontations between inhabitants of squatter encampments and local authorities concerned about the absence of proper sanitation facilities and adverse environmental impacts. The extremely high cost of housing in that area of the state presents serious obstacles to farm laborers who are attracted to jobs in the strawberry, tomato and ornamental nursery fields of the region. For some, building shacks hidden by bushes is the most affordable way to find a place to live. A study of San Diego County farm labor camps estimated there were as many as 200 camps, most of which are not regulated by government authorities [San Diego City Council, 1991].

In California's Coachella Valley, just a short distance from the lush green golf courses and manicured lawns of the luxury hotels of Palm Springs, there is another world rarely seen by outsiders. Near the farm worker town of Mecca, on an otherwise pristine swath of desert land belonging to the Torres-Martinez reservation, some 500 or so trailers are bunched together into a community with several small stores and an auto repair shop. Though never enumerated, the number of residents is estimated to be 2,000 – 4,000 individuals, many of whom are employed in the vineyards, citrus orchards or vegetable fields nearby.

Called "Duroville" by locals, after the name of the man who rents the land to trailer owners, it lies adjacent to a privately owned incineration site described by U.S. EPA as a source of toxic waste. Following legal action initiated by Federal authorities, the owner agreed to repair leaking sewers and other sanitation facilities, and to add some amenities; the complaint was subsequently dismissed.

Noted environmental advocate and author Mike Davis refers to this community as symbolic of what his new book title refers to as the *Planet of Slums*.

"What's happened in California agriculture, in the last 20 years, is that farmers no longer provide places for their workforces to live. So the farm belt of California is full of people living in their cars or living in beat-up

trailers and some even sleeping outside. In Palm Springs, what happened was that Riverside County, for whatever reason, decided to clean up people, mainly farmworkers, living illegally in trailers. Riverside County supervisors started enforcing this law against illegal trailers, not bothering to think about the situation the people lived in and the contradictions created by agricultural needs. And what happened was that Harvey Duro, the former chairman of the Torres-Martinez Band of Cahuilla Indians, allowed people to come and rent spaces on their land. And what you have now is the emergence of these two camps that are [slum] colonies within eyesight of new golf courses and some of the richest communities in the West.”

- Mike Davis, interview by Juris Jurjevics, April 6, 2006

Before Duroville landed amidst the desert landscape, Riverside County was forced to address housing conditions among squatter trailer encampments occupied by farm laborers. A lawsuit brought by California Rural Legal Assistance on behalf of 30 rural plaintiffs, most of whom are farm laborers, charged the county had violated two titles of the Civil Rights Act of 1964. The complaint claimed discriminatory enforcement of mobile home park housing codes based on plaintiffs’ race, national origin and familial status. The county ultimately agreed to a settlement that was officially approved by the U.S. Department of Housing and Urban Development. Under terms of the settlement, the county has committed to a \$21 million program to provide much-needed housing assistance and community services to farm laborers and other rural poor in the region [National Fair Housing Advocate, 2000].

Another less noticed factor indirectly affecting housing supply was the 1986 Immigration Reform and Control Act (IRCA), which granted permanent legal residence status through the Seasonal Agricultural Worker (SAW) visa program to more than 1.1 million agricultural workers, all of whom claimed to have previously worked in the U.S. without authorization. Hundreds of thousands of additional workers followed in their footsteps contributing to a substantial farm labor surplus throughout the 1990s [Villarejo, 1993]. Some farm employers who had previously provided housing to attract migrant workers decided they no longer needed to offer a housing incentive to attract workers, and closed their migrant worker camps.

Over the past two decades, housing for California’s hired farm laborers has repeatedly been of concern to state policymakers. In 1988, the Department of Housing and Community Development issued a comprehensive report based in part on five public hearings convened in communities throughout agricultural areas of the state [California. Department of Housing and Community Development, 1988]. The report, which included material developed by public agencies and published data, as well as summaries of testimony from the hearings, issued findings that began with the categorical statement:

“A majority of migrant farmworkers who do not live in government-sponsored labor camps live in seriously substandard conditions. The most common of these conditions is severe overcrowding. Other common conditions are severe dilapidation of the housing unit, contaminated water supplies, and health hazards related to sewage disposal. Included among

the shelter occupied by significant numbers of migrant farmworkers are buildings which are not intended for residential use, including garages, barns, and storage sheds. The nonresidential buildings which are used as housing typically lack plumbing and sanitary facilities and adequate heating equipment. Unsafe electrical wiring is typical. In addition, many migrants, including their families, are homeless for extensive periods while migrating, living in the fields, in cars, under bridges, and in other non-public locations.”

- California. Department of Housing and Community Development, *Migrant Farmworker Housing in California*, 1988, p. 4.

In 1992, the Governor’s Farm Worker Services Coordinating Council convened six public hearings to assess the need for improved services to hired farm laborers. In their final report, it was noted that the most frequently mentioned unmet need by witnesses was for safe and affordable housing, ranking it ahead in importance before such other concerns as labor law enforcement or education [California, Farm Worker Services Coordinating Council, 1992].

More recently, in 1995, the California Senate Committee on Housing and Land Use convened a public hearing to again re-visit the issue [California. Senate Committee on Housing and Land Use, 1995]. In his testimony, Travis Pitts, then Deputy Director for Codes and Standards for HCD, was asked whether the 1988 report accurately represents conditions in 1995. The 1995 Senate report includes a statement implicitly attributed to Mr. Pitts, “Conditions for farmworker housing remain about the same as they did 10 years ago” [Ibid, p. 4].

Finally, in 2000, a California Assembly report on housing for California’s farm laborers stated categorically,

“Affordable, safe, and sanitary housing is virtually nonexistent for the vast majority of California's farmworkers. When a migrant farmworker arrives in a rural agricultural town, he/she has few options: most of the existing housing is occupied; available units often consist of the most dilapidated units in the community; rents are high; and per-person charges are used to capitalize on "doubling up." If the migrant fails to arrive in town early enough to get a substandard unit, there are four choices available: double up in an occupied unit; pay rent to live in a shed, barn, garage, or backyard; live in a car; or try to obtain housing in a surrounding community and commute to work. Although there are a number of state-operated farm labor camps and some employer-provided housing, these programs address only a minimal portion of the total housing need.”

- California. State Assembly. “Farmworker Housing,” 2000

Additional environmental exposures may also adversely affect farm workers in their homes. The widespread use of agricultural chemicals, both pesticides and fertilizers, may have unintended consequences for farm laborers residing adjacent to or near fields. The San Joaquin Valley air basin is noted for its serious pollution problems,

especially in the late summer and early fall. Dust and various fumes originating in large-scale dairies located in the valley have led to increasing rancor between environmental activists allied with farm labor advocates, on the one hand, and the dairy industry. Little known is the fact that the San Joaquin Valley is now home to fully 20% of all U.S. milk cows. The presence of large herds, numbering in the thousands of animals, is viewed by some advocates as the single most important air pollution issue in the valley.

Private housing is the norm for most farm laborers. But most county-based survey research findings report that many, if not most, dwellings are sub-standard. For example, a survey of farm labor housing in San Luis Obispo County includes the comment that "...the apartments and single-family homes that farm workers manage to acquire are often in substandard condition: dilapidated" [Peoples Self-Help Housing, 1990]. Crowded conditions are widespread in the region because many families share their dwellings with unrelated migrant workers. A report on farm workers in the Santa Maria region just to the south of San Luis Obispo County observes that "...many immigrant families lease parts of their dwelling to non-kin sojourners, violating in the process local housing ordinances and rental agreements" [Palerm, 1994].

More recently, county-based farm worker housing surveys have been conducted in Kern, Monterey, Napa, Santa Cruz and Ventura Counties [HAC, "Taking Stock," 2001; Applied Survey Research, 2001; Martin, 2002; Ventura County, 2002]. Another survey was conducted in conjunction with an initiative to address housing and health problems among agricultural workers [TCE, 2003]. Most of these surveys suggest a significant prevalence of "overcrowding" and "sub-standard housing." But none of these surveys provide independent, third-party, medical assessments of the health of residents.

To date, there has been no population-based survey of farm labor housing conditions throughout California. Testimony in public hearings, summary reports by public agencies, and nearly all submissions of documents or data refer to anecdotal reports or to local surveys, typically at the county level. However, even those reports often lack objective measures of housing conditions likely to affect health, such as sanitation facilities, potable water, sewage disposal, food storage conditions, mold or other pest infestations, chipped or peeling lead-based paint, adequacy of washing and laundry facilities, proximity to known sources of pollution, and so on. And there are no instances in which anecdotal reports include systematic determinations of the health status of residents associated with housing health hazards.

California's hired farm workers

Agriculture is widely regarded as diminishing in importance in a state where more and more land is converted from farming to residential uses. In this context, it might be thought that farm labor is becoming less significant with each year. But the contrary is the case: California agriculture is now more reliant on hired workers than at any time in the past century as a consequence of major increases in the amount of land used for fruit and vegetable production [Villarejo & Schenker, 2005].

California farms have continued to expand production in recent years, posting a 25% increase in cash receipts in the two-year period 2003 and 2004, topping \$30 billion for the first time. Annual production of grapes, tree fruits and vegetables in the state has steadily increased from 21 million tons in the early 1970s to 34 million tons in the early 2000s.

Labor demand has correspondingly increased but the number of farmers and ranchers in the state has declined. The Census of Population and Housing finds that the number of California residents who indicated their occupation was "farmer or rancher" has continued to fall, from 39,271 in 1980 to 36,814 in 1990, then plummeting to just 26,770 in 2000 [United States, Department of Commerce, 1980, 1990, 2000]. This decrease of the number of farmers and ranchers is consistent with the sharply increasing size concentration of the state's farms. Despite more land planted with labor-intensive crops – fruits, vegetables, ornamentals – the largest farms control ever more acreage and fewer farmers tend the land.

Hired workers are supplying an ever-increasing share of the labor needed on California farms. According to the Department of Employment Development (EDD), the annual average of monthly employment on the state's farms grew from about 314,670 in the period 1975-77 to 392,791 in 1999-2001 and then fell slightly to 368,666 in the period 2002-04 [California, Department of Employment Development, various years]. "Employment" refers to the number of full-time-equivalent (FTE) workers. Thus, two individuals who each work about 1,000 hours picking crops are equivalent to just one FTE, and count only as "one" in the employment figures.

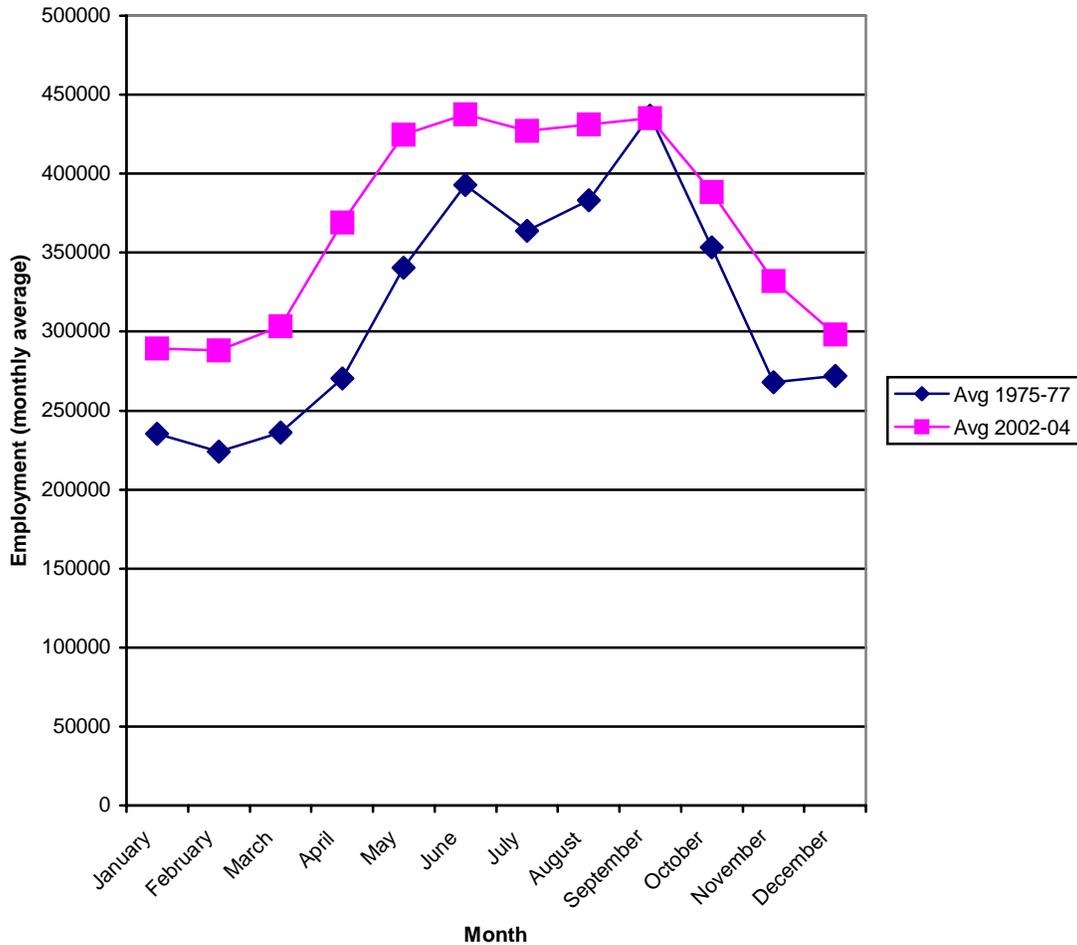
A second, less-studied feature of the farm labor market is the increase of the number of year-round or regular employees directly hired by farm operators. From 1974 to 2002, the number of direct-hire workers reportedly employed for 150 days or more on California's farms increased by 48%, from 136,216 to 201,852 [United States, Census of Agriculture, 1974 & 2002]. In part, the increase in year-round or regular employment reflects the replacement of farmer and unpaid family labor with hired labor. Also, California's mild climate has made it possible to develop more year-round production, such as strawberries, lettuce and ornamental products, as well as encouraging the breeding of early or late-season varieties of many crops.

Important insights into the pattern of employment of hired farm workers can be obtained from monthly employment reports, and how they have changed over the course of the past quarter-century. Figure 1 shows the monthly farm employment reports for the periods 1975-77 and 2002-04.

What is especially interesting in Figure 1 is that reported employment has increased in every month of the year except September and a single prominent peak in 1975-77 (September) has been replaced with a roughly five-month period of peak

employment in 2002-04 (May-September). Thus, there is no longer a “peak season” of short duration, and there is a great deal more work during nearly all of the year, even during what some had thought of as “off-season”. This finding is consistent with the increase in year-round or regular employment described earlier.

**Figure 1. Hired Farm Worker Employment by Month, California
Avg 1975-77 & Avg 2002-04, EDD**



Not apparent in the above-cited data is the degree to which California’s farm operators directly hire regular or year-round workers and tend to rely on labor market intermediaries for short-term or temporary labor needs.

In part, the growth of the number of workers directly hired for 150 days or more reflects the increased importance of the dairy and ornamental nursery industries. But, as noted previously, larger farm size among fruit and vegetable producers, and the decline of farmer and unpaid family labor has opened a niche for skilled, long-term farm employees.

Table 1 shows the pattern of California farm employment in each of four weeks of the year during which the U.S. Department of Agriculture conducts a survey of farm

employers. Both farm operators and labor contractors are included in the survey. What is noteworthy is that only a small fraction of the reported short-term farm employment is direct-hire by farm operators. At the same time, the regular or year-round employment is substantial, and exceeds the combined totals of short-term direct-hire and contract labor for three of the four weeks surveyed.

Table 1. Hired and Contract Farm Labor, California, 2005

Source: USDA, Farm Labor (includes revised figures)

<i>Week</i>	<i>Direct-hire (150+ days)</i>	<i>Direct-hire (<150 days)</i>	<i>Contract labor</i>
Jan 9 – 15	119,000	24,000	75,000
Apr 10 – 16	147,000	35,000	97,000
Jul 10 – 16	162,000	44,000	141,000
Oct 9 - 15	146,000	37,000	107,000

A new report prepared for the U.S. Environmental Protection Agency provides thorough and up-to-date findings about the state’s farm labor force [Aguirre/JBS, 2005]. Based on face-to-face, off-worksites interviews with 2,344 farm laborers during 2003-04 conducted in California by the National Agricultural Workers Survey (NAWS) of the U.S. Department of Labor, the newly released report not only provides information about current workers, but also furnishes comparative findings of the NAWS for California in successive two-year intervals dating back to 1989-90 [Aguirre/JBS, Public Access Data, 2005]. The National Agricultural Worker Survey (NAWS), initiated in 1988 and sponsored by the U.S. Department of Labor, has published reports both for the U.S. and, separately, for California. The NAWS is an employment-based survey of crop workers; workers employed in livestock agriculture are excluded. Randomly selected farm employers are asked to allow interviewers to contact workers who are randomly selected.

NAWS finds that the hired crop farm labor force is mostly comprised of young, married, foreign-born (nearly all Mexican), low-income, Spanish-speaking men with low educational attainment who do not migrate to “follow-the-crop”. The proportion of workers who are undocumented or who are indigenous migrants has increased significantly from 1989-90.

According to the NAWS report, just one-third (33%) were “migrant” workers, that is, traveled more than 75 miles to obtain a job in agricultural production. The overwhelmingly large share of those who migrate (85%) are persons who travel from Mexico or Central America to find farm work in a single location, and then return home after the job has ended. Only 15% of workers who migrate say they “follow-the-crop.” However, among those with less than two years of farm work, termed “newcomers”, nearly all (98%) migrate within the U.S. to find work. But, of those who report residing in the U.S. for three or more years, just 13% report they still migrate to farm jobs.

Nearly two-thirds (61%) of California’s hired crop farm workers said they worked for their current employer on a seasonal basis, and 20% said they were employed year round. This finding is consistent with the previously noted increase of direct-hire, year-round or regular workers (persons employed by a farm operator for 150 days or more) and with the rise of labor contractor employment.

The most significant development within the California farm labor market in recent times is the sharply increased flow of indigenous migrants from the southern Mexican states of Chiapas, Oaxaca, Guerrero, Puebla (Northern Sierra region) and Veracruz [Zabin, 1993]. A particularly useful contribution of the new NAWS report is the highlighting of findings that inform aspects of this migration.

All observers agree that indigenous migrants are the fastest growing component of the state's farm labor force. According to the NAWS report, "Workers from (Mexican) states with high indigenous populations have characteristics that differ from other farmworkers, including a higher percentage of newcomers, migrants and with lack of authorization to work in the U.S."

Where do today's farm workers reside?

Two cross-sectional surveys of the farm labor population include some information about housing: the National Agricultural Worker Survey (NAWS) and the California Agricultural Worker Health Survey (CAWHS). Although questions about housing are somewhat limited in scope, the NAWS does ask workers to report on the type of housing in which they reside at the time of the interview, the location of the living quarters relative to their work site, the number of rooms in the dwelling, the number of persons who sleep there, and the monthly or weekly housing costs. But no questions are asked about the physical conditions of the housing [United States, DoL, NAWS Survey Instrument, 1999].

One of the most striking findings of the NAWS is that very nearly half (49%) of hired crop farm workers did not reside with even a single member of their nuclear family while working on California farms. Among males, 60% were unaccompanied by any member of their immediate family, whereas just 18% of females were unaccompanied.

Nearly two-thirds (62%) of crop workers report their place of residence to be a single-family home. About a quarter (29%) said they reside in an apartment, six percent live in mobile homes, two percent live in dormitory or barracks-style housing, and one percent live in duplexes or triplexes. Only three percent of workers live on their employer's farm, and just one percent live off-farm in housing owned by their employer.

The California Agricultural Worker Health Survey (CAWHS) interviewed 970 randomly selected hired farm workers during the period March – December 1999. The sample was statewide and cross-sectional in seven representative communities [Villarejo, 2000]. Overall, an 83% response rate was achieved in the main survey interview. The CAWHS includes, in addition to the same housing-related inquiries from the NAWS, a series of questions that bear directly on the physical conditions of housing [CIRS, CAWHS Survey Instrument, 1999]. All workers age 18 or older employed to perform farm tasks, crop or livestock, at any time in the previous 12 months were eligible to participate. Copied from the U.S. Census of Population and Housing, those additional housing-related questions sought to determine the status of sanitation, washing, waste disposal and food preparation facilities in each dwelling visited by interviewers.

Equally important, the CAWHS staff sought to independently determine whether each dwelling was recognized by the local County Assessor and also by the postal authorities as having a regular street address. Nonresidential structures where some workers were found to be living, such as garages, sheds, barns, abandoned vehicles or squatter encampments, rarely have both a regular street address and recognition by the County Assessor as dwellings suitable for human habitation. Thus, the CAWHS was able to measure the extent to which some workers were residing in irregular housing. But the CAWHS did not include direct, objective measures of housing health hazards.

A pilot survey conducted earlier in the city of Parlier (Fresno County) provided an opportunity to develop and test the household survey methodology ultimately adopted later by the CAWHS [Sherman, 1997]. Parlier is a farm worker town located in the midst of a major center of grape and tree fruit production. In addition to enumerating all permanent dwellings (single family residences, multi-residence "row" houses, and apartment buildings), a substantial effort was made to identify irregular dwellings, typically non-residential structures not intended for human habitation. One of the key

findings of the Parlier survey was the extent to which farm laborers were found to reside in “back houses”: sheds, barns, trailers, irregular structures and garages located behind a single family residence or other permanent dwelling. Most often, residents of the “front house” were not farm laborers but earned additional income through rental of the “back house” during the busiest seasons of the year. The absence of an adequate supply of safe and affordable housing for migrant workers in or near town fueled this financial opportunity for landlords of the “front houses.”

A three-stage sampling strategy was utilized in the CAWHS, successively narrowing the geographic scope for the random selection of participants: community, dwelling, household. A total of 937 dwellings housed CAWHS participants. Of these, 32 had two or more CAWHS participants because the survey protocol allowed for the possibility of randomly selecting more than one individual in a dwelling with a large number of residents. In each dwelling surveyed, a comprehensive enumeration of all eligible persons was completed. All dwellings in each site’s precisely described geographic area were enumerated and classified according to one of four major categories:

Permanent structure – dwelling is recognized by the County Assessor for real property tax purposes and has a situs address recognized by the U.S. Postal Service.

Temporary structure – dwelling is neither recognized by the County Assessor for real property tax purposes nor has a situs address recognized by the U.S. Postal Service. This category excludes “labor camps” and “vehicles utilized as dwellings.”

Labor camp structure – dwelling is located within a State- or County-recognized farm labor camp, or residents themselves describe their dwellings as such.

Vehicle – dwelling consists of an automobile, pickup truck with a camper shell, or other vehicle that is primarily used for transport to and from work, for shopping and similar essential transport purposes.

Though reasonably unambiguous at first sight, this classification scheme does not necessarily reflect dwelling quality. The CAWHS did not seek to determine whether each dwelling had health hazards associated with housing conditions. For example, the category “temporary structure” includes garages, sheds and other structures not designed or intended for human habitation, but also includes various types of trailers and mobile homes, some of which were observed to be of good quality, certainly as good or better than some of the permanent structures surveyed. No effort was made to further refine this classification scheme to take account of housing quality.

Measures of dwelling quality in the CAWHS were limited to inquiries about plumbing and food preparation facilities, and whether it had telephone service. Overall, respondents reported that 4.4% of dwellings lacked plumbing and 3.8% lacked food preparation facilities. But some 20% were entirely without telephone service. It is likely that the last finding is more indicative of the economic status of the residents as opposed to any intrinsic shortcoming of the dwellings.

The absence of plumbing or kitchen facilities was strongly associated with the type of dwelling. Just 1% of permanent structures lacked such facilities. But 17% of temporary or labor camp structures did not have either or both of these facilities. All of the vehicles that served as dwellings lacked both plumbing and kitchen facilities (100%).¹

Dwellings in which hired farm workers were found to be residing were mostly permanent structures (81%). Temporary structures ranked next in importance (10%), followed by labor camps (6%) and vehicles (2%).

Table 2 shows, for each category, the total number of dwellings enumerated, contacted, with qualified residents, and in which qualified persons agreed to participate in the CAWHS. For this purpose, the two categories “temporary structure” and “vehicles” have been combined.

Table 2. Summary of Dwellings by Type of Dwelling and Participation Seven California Communities, CAWHS, 1999, N = 935

<i>Type of Dwelling</i>	<i>Enumerated</i>	<i>Contacted</i>	<i>Farm Worker Resident</i>	<i>Participant in CAWHS</i>
Permanent	10,284	2,461	875	762
Labor Camp	554	227	110	60
Temporary & Vehicle	1,038	301	185	113
<i>Totals</i>	11,876	2,989	1,170	935

What Table 2 shows is that, in these seven communities, just over one-third (36%) of permanent structures contacted were dwellings in which farm laborers resided. But nearly half (48%) of labor camp dwellings were occupied by hired farm workers, and nearly two-thirds of temporary structures or vehicles serving as dwellings were “home” for farm laborers (61%). However, as previously indicated, permanent structures were, by a large margin, the most numerous of the dwellings in which farm laborers resided.

The finding that only one in three permanent structures in these communities served as a residence for a CAWHS-eligible participant was somewhat surprising: five of the seven communities are well-known to be “farm worker towns.” But even in these five communities, the same pattern was found. Relatively fewer of the permanent structures had residents who were hired farm workers as compared with the proportion of labor camps and temporary structures occupied by farm laborers.

The most extreme case of this was in Mecca, where an estimated 2,572 CAWHS-eligible workers were resident at the time of the survey, but nearly two-thirds (60%) were estimated to be living in labor camps, temporary structures or vehicles. Of course, the survey in each community was timed to coincide with the likely peak period of hired farm labor demand. Thus, workers who migrate to a community with the intention of finding farm employment might be expected to reside in labor camps within or near the town, or in other temporary quarters.

It is important to realize that timing the surveys in this manner had a major influence on the findings regarding housing occupancy: the influx of people seeking to

¹ In Mecca, many hired farm workers who reside in vehicles choose to park overnight in one or another vacant lot adjacent to a convenience store. Two portable chemical toilets were observed in one of the lots, and potable water is available. No cooking facilities of any kind were available in the vacant lots or store.

fill temporary jobs tends to fill all available dwellings and some workers may choose to reside in irregular structures to avoid paying higher rental costs. Thus, while the results of the CAWHS study were heavily influenced by the survey timing, the housing circumstances of large numbers of workers who only reside on a temporary basis in each community could not have been determined at other times of the year.

CAWHS participants were asked to describe the type of housing in which they reside – single family (detached or attached), multi-apartment structure, mobile home or trailer, recreational vehicle, automobile, etc. – following designations used in the Census. This classification scheme was independent of that used by the researchers described previously and may more accurately provide a description of farm worker housing.

The main findings of this self-reported classification is that nearly half of CAWHS participants (48%) said they resided in “single family dwellings,” and three-quarters of these said they were living in detached single family dwellings.

Another one-third (35%) reported residing in multi-unit apartment buildings, about one-eighth (12%) said they lived in a mobile home or trailer. Roughly one in fifty (2%) said they lived in their automobile, and about one in one hundred said they were homeless, living in the open or “under the trees.”

These findings conform reasonably well with the dwelling classification scheme discussed previously. Permanent dwellings were the descriptors applied by researchers for 81% of dwellings in which hired farm workers were found, versus 82% of the participants saying they lived in single-family houses or conventional apartment buildings. Similarly, the number of participants who reported residing in their vehicles (2%) corresponds exactly to the number enumerated by the researchers. Only for the two categories T (temporary) and L (labor camp) are there ambiguities of correspondence with what the workers themselves reported. Most of the structures classified as T or L by the researchers were described as mobile homes or trailers by the workers. In a few cases, dwellings classified as L were found to be permanent structures in which a worker was renting a bed or a single room.

Housing tenure: most CAWHS participants are renters

Approximately two-thirds (67%) of CAWHS participants rent their dwelling. Roughly one in sixteen (5%) participants rent from their employer. Both of these findings were highly variable from site to site.

Table 3 shows the percent renters as well as the median total rental cost in each of the seven sites. No effort was made to independently determine average rental costs for all apartments in each community. It is unlikely that rental units available to farm laborers accurately represent a cross-section of apartments in a given community. Importantly, most rentals were reportedly month-to-month, thus avoiding the costly initial payment of “first month, last month and security deposit” that might otherwise be a barrier to obtaining typical rental housing in a given community. But more than a few participants reported having to pay a security deposit along with the first month’s rental in advance.

**Table 3. Percent Renters and Median Monthly Total Rental
CAWHS, 1999**

<i>Community (CAWHS site)</i>	<i>Renters (percent)</i>	<i>Total Monthly Rent (per Dwelling)</i>
Arbuckle	48%	\$344
Calistoga	90%	\$525
Cutler	77%	\$350
Firebaugh	63%	\$350
Gonzales	90%	\$600
Mecca	73%	n.a.
Vista	94%	\$600

Rental costs were also found to be quite variable from community to community. Overall, the median total rent for a rented CAWHS dwelling was found to be \$420 per month.² But workers who resided in communities in the Coastal areas of the state paid much higher rentals (reported medians between \$525 and \$600 per month). On the other hand, those residing in the three Central Valley “farm worker towns” (Arbuckle, Cutler, Firebaugh) paid much lower rentals.

CAWHS participants were also asked to report whether they, or a member of their household, owned the dwelling in which they resided. Nearly one-fourth of CAWHS dwellings (23%) were owned by the participant or another household member. In Arbuckle, half (51%) of CAWHS participants said they owned their home. But in Vista, just 6% were homeowners. Significantly, about one worker in fourteen responded to this question by saying they “Didn’t know” or otherwise declined to answer. Table 4 provides data on the median total family income range reported for each category of housing tenure.

**Table 4. Median Total Family Income (1998, range) by Housing Tenure,
CAWHS, 1999**

<i>Housing tenure</i>	<i>Median total family income (1998, range)</i>
Homeowner in household - mortgage	\$20,000 - \$24,999
Homeowner in household - no mortgage	\$12,500 - \$14,999
Renter	\$10,000 - \$12,499
Employer owned housing	\$10,000 - \$12,499
Employer owned land/space only rental	\$5,000 - \$7,499

The most significant finding reported in Table 4 is that the median total family income reported by homeowners is much higher than that reported by renters. For purposes of comparison, the overall median total family income reported by all CAWHS participants was in the range \$12,500 - \$14,999.

² Some CAWHS participants said they paid a weekly or daily rent for their dwelling. In these instances, the figures provided by the participants were converted to a monthly basis.

Computation of Pearson’s correlation coefficient shows that home ownership is associated with increased family income at +0.410 (significant at the 0.01 level). In other words, the higher the family income, the greater the chance that a farm worker can afford to purchase a home.

The self-reported median family income was determined for each category of housing type described by CAWHS participants. This is shown in Table 5, where it is reported that residents of single family detached units or of multi-unit apartment buildings reported the highest median incomes. It must be noted that participants were asked to report their total family income within a specified range, corresponding to Census categories. Median values correspond only to the range in which it is found.

Table 5. Median Total Family Income (1998, range) by Housing Type CAWHS, 1999

<i>Type of Housing</i>	<i>Median Total Family Income (range)</i>
Single family detached house	\$12,500 - \$14,999
Single family attached house	\$10,000 - \$12,499
Apartment building (2 or more units)	\$12,500 - \$14,999
Mobile home/trailer	\$10,000 - \$12,499
Rented room in hotel/motel	\$5,000 - \$7,499
Rented room in boarding house or labor camp	\$5,000 - \$7,499
Recreational vehicle/camper	\$5,000 - \$7,499
Personal automobile	\$5,000 - \$7,499

Importantly, persons residing in rented rooms, recreational vehicles, or personal, automobiles reported much lower total family incomes than persons who reside in single-family detached houses or conventional apartment buildings.

Dwelling vacancy rates in farm worker communities are very low

Another aspect of the CAWHS that addresses housing-related conditions in these seven communities is the vacancy rate. Interviewers directly determined through observation and inquiry which dwellings they sought to contact were vacant at the time of the survey. Dwellings found to be vacant were carefully distinguished from those that were occupied but in which the residents could not be contacted, despite repeated efforts to do so.

Table 6 summarizes the findings regarding vacancies in permanent structures. It is, of course, far less meaningful to report vacancies in the other dwelling categories. The very low vacancy rates in Cutler, Gonzales, Mecca and Vista is quite striking, and likely accounts for the disproportionate share of workers residing in labor camps, temporary structures and vehicles. This finding is consistent with the observation that in communities with a housing shortage, hired farm workers live wherever they can find shelter, no matter how tenuous it may be. The reported total monthly rentals reported in Table 3 bear no relationship to the corresponding vacancy rates in each of the communities.

Table 6. Vacancy Rates in Permanent Structures, CAWHS, 1999

<i>Community (CAWHS Site)</i>	<i>Vacancy Rate</i>
Arbuckle	6.7%
Calistoga	8.6%
Cutler	2.4%
Firebaugh	4.4%
Gonzales	1.3%
Mecca	1.7%
Vista	1.8%

Occupant density and crowding in CAWHS dwellings

CAWHS participants were asked to report the number of persons who sleep in the dwelling as well as the number of rooms in the dwelling. The highest number of persons residing in a single dwelling was 17, found in five-room structure in Calistoga. Six or more persons were found to be resident in each of 227 dwellings, or one-fourth of the total number of dwellings. At the other size extreme, just 56 of the total of the 3,842 persons enumerated lived alone. Overall, the reported average number of residents per dwelling was 4.33.

Table 7. Average Number of Residents per Dwelling, CAWHS, 1999.

<i>Dwelling Category</i>	<i>Persons per Dwelling (mean)</i>
Permanent	4.37
Temporary	4.13
Labor camp	3.43

As shown in Table 7, the reported average number of residents per dwelling varied with the type of dwelling: permanent dwellings had, on average, more residents while labor camps had the least. The vehicle category is not considered here.

Table 8 reports findings regarding the average number of residents per room. The CAWHS finds that permanent dwellings are, on average, the least crowded whereas temporary dwellings are the most crowded. In fact, temporary dwellings had, on average, 26% more persons per room than did permanent dwellings. Labor camps were only slightly less crowded than temporary dwellings.

Table 8. Average Number of Residents per Room, by Type of Dwelling CAWHS, 1999

<i>Type of Dwelling</i>	<i>Residents per Room (average)</i>
Permanent	1.44
Temporary	1.82
Labor camp	1.80

CAWHS project field staff repeatedly presented anecdotal evidence of “crowding” which they observed in dwellings occupied by CAWHS participants. “Overcrowding” is described in the literature as corresponding to an average occupancy of 1.01 or more persons per room [Myers, 1996]. By this measure, 48% of all CAWHS dwellings were “overcrowded,” and 25% of CAWHS dwellings were “extremely overcrowded” (1.51 or more persons per room).

A surprising finding was that 42% of CAWHS dwellings were shared by two or more unrelated households. This figure varied greatly from site to site. In Vista, the community where it was largest, this figure was a striking 87%. Shared dwellings could not be simply characterized. It was found that sharing arrangements in some instances involved groups of unaccompanied men while in other cases it was two or more families, in which spouses and children were present. It was also found that a “primary” renter would sometimes sub-lease a room, or a bed, to help meet the rental cost, which partly accounts for the large proportion of shared CAWHS dwellings.

Characteristics of hired farm worker households in the CAWHS sample

In 309 CAWHS dwellings (33%), the participant was *unaccompanied* by even one member of their immediate family. In nearly all such instances, the other members of the participant’s family were residing in Mexico at the time of the survey.

In 626 CAWHS dwellings (67%), the participant was *accompanied* by at least one family member. No effort was made to further analyze the nature of the familial relationships of those residing with the CAWHS participant, although the data is available. This is because of the great variety of types of accompanying family members: spouses, parents, children, siblings, aunts, uncles, cousins and nephews were all mentioned. For example, it was not unusual to find that a CAWHS participant was accompanied by his or her spouse, but that some or all of their children remained in Mexico.

Of CAWHS participants who were unaccompanied, 82% were male. Substantial differences were also found regarding the marital status of those who were unaccompanied as compared with those who were accompanied. Of married CAWHS participants, 82% were accompanied by at least one family member, while 66% of single CAWHS participants were unaccompanied.

These findings regarding accompaniment status differ sharply from national findings regarding hired crop farm workers reported by the NAWS. In 2001-02, the NAWS finds that 57% of all hired crop farm workers were unaccompanied vs. the 33% figure reported herein for the CAWHS (United States, Department of Labor, 2005).

Most CAWHS participants reported very low total annual family or household incomes during the year prior to the survey. The median reported value was in the range \$12,500 - \$14,999 (nominal, 1998 dollars). However, the reported values of median total income varied widely from community to community. The lowest values of median total income that were reported were in Cutler and Vista where it was in the range \$7,500 - \$9,999. The highest reported values were in Arbuckle and Calistoga. In both of these communities, the reported median total income was in the range \$20,000 - \$24,999. Table 9 shows the values of median reported family income for all seven CAWHS sites.

Table 9. Median 1998 Family Income, CAWHS, 1999 vs. Median 1999 Family Income, Community-wide, Census, 2000

<i>Community (CAWHS site)</i>	<i>Median Family Income (1998), CAWHS 1999</i>	<i>Median Family Income (1999), Census 2000</i>
Arbuckle	\$20,000 - \$24,999	\$36,573
Calistoga	\$20,000 - \$24,999	\$44,375
Cutler	\$7,500 - \$9,999	\$24,432
Firebaugh	\$15,000 - \$17,499	\$33,018
Gonzales	\$15,000 - \$17,499	\$41,773
Mecca	\$10,000 - \$12,499	\$21,250
Vista	\$7,500 - \$9,999	\$45,649

Clearly, self-reported median family incomes in CAWHS households are well below the corresponding community-wide median values. Higher total family income relative to the community's median family income appears to be associated with a higher percentage of home ownership in Arbuckle (where rentals are relatively low), or with a higher monthly rental in Calistoga (where housing purchase prices are relatively high).

In Vista, where total family income is extremely low - just one-fifth of the community median - the CAWHS finds both higher monthly rentals and an extremely high proportion (87%) of dwellings shared by two or more families.

In Mecca, rents are lower, but so is the reported median total family income, and the proportion of participants who reside in temporary or labor camp dwellings is very high. Of course, those who reside in vehicles typically pay no rent.

Finally, Gonzales and Firebaugh are interesting because although the median reported total family income is the same the percentage of home ownership is much lower in Gonzales and rental costs are relatively high (reflecting higher housing prices), but in Firebaugh the rentals are relatively lower and home ownership is relatively higher (reflecting lower housing prices).

Discussion of CAWHS findings

Nearly one-third of CAWHS participants reside in temporary or labor camp structures, or in vehicles that are primarily used to go to work or for other necessary transportation purposes. It is very likely that most of these irregular dwellings were not enumerated nor contacted by the U.S. Census, and not included in Census findings.

On average, CAWHS dwellings have 4.33 persons who reportedly sleep there, which is much higher than the average of 2.87 persons per dwelling reported in the Census 2000 for California. Nearly half of all CAWHS dwellings (48%) are overcrowded, and one-fourth (25%) are extremely overcrowded.

The extent of crowding in dwellings occupied by hired farm workers is better measured by the high number of persons per room, 1.82 in the case of temporary structures. A four-room permanent dwelling would have six persons (actually, 5.76 persons, on average) sleeping there. But a four room "temporary" structure has, on average, seven persons sleeping there (actually, 7.28 persons, on average).

One-third of all CAWHS participants are unaccompanied while working in California. That is, these are persons who are working without any member of their family present with them. Most unaccompanied persons are unmarried men.

Total family incomes in CAWHS households are very low, in the range of \$12,500 - \$14,999, leading to crowding and the widespread use of temporary quarters. Some 42% of all CAWHS dwellings were shared by two or more unrelated households. In California as a whole, Census 2000 reported that just 8% of all dwellings were shared by unrelated persons.

In the Coastal areas of the state, where housing prices and rentals are high, relatively few hired farm worker households can afford to purchase a home, and crowding is even greater. In Vista, some 87% of CAWHS dwellings were share by unrelated households.

Average CAWHS rental costs are \$420 per month, and the median family income of renters is in the range of \$10,000 - \$12,499, suggesting that between 40% and 50% of total income is spent on housing. But some of those who are renting sub-lease a room or bed to another household, which means the income from the sub-lease may contribute to the total rental payment. Similarly, it was not possible to accurately determine the exact financial arrangements between two or more householders sharing a dwelling. Since 42% of dwellings are shared in this manner, the uncertainty is probably large.

One of the shortcomings of the CAWHS was the relative difficulty in finding workers who are homeless and who may sleep “under the trees,” or “in the open.” An effort was made to find such workers through day laborer gathering places in and near Vista. But the temporary nature of such quarters and the varied strategies in widespread use presented obstacles that were difficult to overcome. Of course, it can be argued that many persons residing in irregular dwellings lacking even a postal address are, in fact, technically homeless. After all, a homeless person, by definition, is someone without a residence in a dwelling intended for human habitation with a permanent address. In a needs assessment of migrant farmworkers some years before the CAWHS, a man who rents out space to farm workers stated:

“There isn’t any place for *mis paisanos* (my countrymen) to live. They won’t let the single men rent houses here because they always end up with fifty or so of them all living under the same roof. I let these guys and couples stay here in my backyard because they don’t have any other place to go. If they stay in the park the cops chase them out. The ones with cars just park here in front of my house, they sleep in their cars. My wife won’t let everyone in to use the bathroom because it would just be too much, so they all go to the San Joaquin river to bathe and clean up after work.”

- B. Bade, *Migrant Farmworker Needs Assessment*, December 1989

Farm Labor Housing – Public and Private Initiatives

There are 26 public migrant housing centers in 16 counties, mostly in rural or agricultural areas, exclusively reserved for the use of families, with no provision whatsoever for unaccompanied workers. Typically open for only six months during the local peak agricultural season, these labor camps altogether provide housing for 2,107 families [California. Assembly, 2000]. Prospective residents must have traveled at least 75 miles from their permanent place of residence and meet strict low-income requirements. Most centers are under the administration of a county housing authority. Many centers provide substantial additional services, ranging from on-site clinics to child-care centers. The Sue Brock Childcare Center located in one of San Joaquin County's migrant housing centers, is an exemplary program.

Clearly, the exclusion of unaccompanied workers, and of undocumented workers from those units that were built or rehabilitated with federal funds, implies that the vast majority of today's migrant farm laborers are ineligible for this housing. Additionally, despite the recent substantial increase in farm labor employment and of substantial shifts in the regions where workers are needed, there has been no significant new investment in this type of public housing in many years.

On the other hand, substantial state and federal funds have been invested in programs intended to assist year-round farm worker families to purchase homes or to rent dwellings. Since 1977, the California Department of Housing and Community Development has provided funds for constructing or rehabilitating about 3,500 units [California. Assembly, 2000]. Again, as in the case of the migrant housing centers, the emphasis has been on assisting families. And programs that rely on federal funding exclude unauthorized immigrant workers.

An important initiative was undertaken in Napa County, where winegrape producers obtained new tax authority whereby each vineyard parcel is assessed \$7.76 per acre to create a fund to address local farm labor housing [Napa Valley Vintners, 1993]. Napa County is presently supporting a farm labor housing needs survey to inform local agencies and the wine industry about how to address the housing problem.

Most private initiatives focus on "the dream of home ownership" for low-income families without addressing the unmet needs of unaccompanied workers. A number of non-profit groups, however, have played a positive role in such initiatives as providing assistance for self-help housing or bringing health care services together with new housing developments. In recent years, a few of these private agencies have begun to give some attention to the needs of unaccompanied workers.

Some farm employers continue to invest in housing for their employees. For example, Harry Singh & Sons, an important producer of vine-ripe pole tomatoes headquartered near Oceanside in northern San Diego County, reportedly invested \$2.5 million in 1990 to construct a modern dormitory complex for the firm's migrant workers. Today, Mexican laborers admitted to the U.S. through the H-2A temporary guest worker visa program comprise the majority of residents of the complex. Under the H-2A program, farm employers are obligated to provide suitable housing for their workers.

A survey of 1,100 farm and ranch operators in California finds that one-third currently provide housing for their workers. Most of those providing housing are larger operations, with 100 acres or more in production. Interestingly, dairy and livestock

operators were the most likely to provide housing for their employees, perhaps reflecting their need for year-round workers. Two-thirds of participants in the survey say that the cost of development is a major factor in discouraging employers from housing their workers [California. HCD, 2001].

There is evidence that enforcement of California's Employee Housing Act is lax. Employer-owned dwellings housing employees are required to be registered and inspected by qualified government authorities. The California Department of Housing and Community Development has delegated responsibility for inspections to county public health officials (except for a few very small counties lacking resources to carry out the mandate). A careful review by the U.S. Environmental Protection Agency, Region 9, of compliance with the Safe Drinking Water Act found evidence of widespread violations in employer-owned labor camps throughout the state [United States. EPA, 1991].

Another difficulty facing enforcement efforts is evasion of labor camp registration requirements through the practice of some labor contractors to obtain access to rental dwellings, either directly or through family members, and then provide housing for their employees. A notorious example of the potential for health-threatening harm in such circumstances was found recently in Sonoma County:

“A ramshackle rental home that housed 29 farmworkers in Windsor, Sonoma County, was raided by a task force of federal and state agencies in mid-April. The laborers cooked indoors with camp stoves and slept on wall-to-wall mattresses in the house, which was littered with trash and flooded with sewage from a failed septic tank. The workers were employed by Israel Gonzales, a Fresno, Calif., labor contractor, and worked at Gallo Vineyards...Gonzales previously had his labor contractor's license revoked, and was working under a permit in the name of his daughter.”

- *Wines & Vines*, July 2005, p. 49.

Public agencies and private organizations have made, and continue to make substantial investments in low-income housing. But only a small portion is earmarked for hired farm laborers, and most of that is targeted to family home ownership.

Of current concern is the expiration of an important type of some housing subsidies for low-income persons. A program of the U.S. Department of Housing and Urban Development provides a housing subsidy for a limited number of qualified low-income residents. Known as “Section 8” housing (a reference to the specific provision of relevant law), many low-income workers who have benefited from this form of public assistance for a portion of their housing costs now face an irreversible sunset of these supports. The expiration of Section 8 assistance will contribute to a significant reduction of the supply of safe and affordable housing for low-income workers, including farm laborers.

Health outcomes associated with sub-standard housing conditions

In recent years, there has been a substantial increase in the published literature reporting on health outcomes found among farm laborers residing in labor camps or otherwise associated with living conditions. The following summary highlights research reports that possibly implicate sub-standard housing conditions with adverse health outcomes among hired farm workers.

- Not having a refrigerator in the place of residence was associated with a tripling of self-reported gastro-intestinal disorders in a cross-sectional survey of Tulare County farm laborers [Frisvold, 1988].

- Inadequate sanitation and water facilities, or lack of laundry facilities, has been associated with an increased likelihood of pesticide contamination of all family members via work clothing brought into the home [Meister, 1991].

- Recent direct measures of pesticide contamination of farm labor dwellings indicate the presence of agricultural chemicals likely brought in from the fields, possibly in work clothing or work boots [Bradman, 1997; Bradman, 2006; McCauley, 2001; Curl, 2002; Goldman, 2004; Quandt, 2004; Lambert, 2005]. It is not clear whether there is an association between these findings and adverse health outcomes specifically related to sub-standard housing conditions.

- An EPA Region 9 survey of California labor camps in violation of the Safe Drinking Water Act found that enforcement by local environmental health officials was lax. Some 191 labor camps serving over 8,500 people in 20 counties were found to be in violation [United States, EPA, Region 9, 1991]. This survey did not seek information about the health status of residents of the labor camps.

- A study of stressors associated with symptoms of anxiety and depression finds that “poor housing conditions” identified by farm laborers were associated with significantly elevated levels of anxiety and depression [Magaña, 2003].

- There is some evidence that farm labor camp water wells are more likely to contain pesticide residues than municipal wells in rural areas. Shortly after the pesticide DBCP was banned in the late 1970s, 16 farm labor camp water wells were tested for contamination by DBCP. Six of those wells (38%) were found to have trace amounts of DBCP between 1.0 ppb and 9.9 ppb; but of 61 municipal wells in rural areas that were also tested, just eight (13%) had similar levels of the pesticide [Peoples, 1980]. However, these investigators did not seek to measure health outcomes among residents where DBCP contamination was found.

- Various authors indicate that crowding is common in residences occupied by hired farm laborers [Holden, 2002; Early, 2006]. However, there are, as yet, no population-based studies directly implicating crowded living conditions among farm laborers, per se, to adverse health outcomes.

- A recent study of housing conditions in 644 residences of pregnant Latina women and their children the Salinas Valley finds a very large share were sub-standard, commonly having cockroach or rodent infestations, and 39% were also overcrowded [Bradman, 2005]. Pesticides for home use were commonly stored or applied in many dwellings. These findings did not implicate health adverse outcomes with sub-standard or overcrowded conditions.

Infectious diseases, such as tuberculosis and parasitic infections, are far more prevalent in the countries of origin of immigrant farm workers than in the U.S. population. Three types of disease found among farm laborers are discussed further below, but it must be emphasized that immigrant workers infected in their countries of origin might spread the disease among other residents of farm labor dwellings while in the U.S. The real hazard in the case of tuberculosis in the U.S. is that poor housing and poor public health surveillance will result in the dissemination of active TB among farm laborers. Thus, large number of unrelated farm laborers residing in housing is a risk factor. But the underlying risk for TB in the population is due to conditions in the sending countries.

- The first population-based study of tuberculosis among hired farm laborers was in North Carolina in which a high prevalence (33% among Hispanics, 54% among U.S.-born blacks, and 76% among Haitians) of positive reaction to the tuberculin PPD skin test was found [Ciesielski, 1991]. A prevalence of 24 cases per 100 of positive reaction to the tuberculin PPD skin test was found in a survey among residents of farm labor camps serving migrant workers in northeastern Colorado [Snyder, 1995]. A lower prevalence (17%) of positive reaction to the PPD skin test was found in a larger sample of residents of two northern California government-funded farm labor camps [McCurdy, 1997]. In the North Carolina study, active TB was found among both U.S.-born blacks and Hispanics. In the Colorado study, several workers were referred for treatment, while the California study found no case of active TB.

- A survey of Mexican immigrants in Ventura County finds an elevated prevalence of *Taenia solium* cysticercosis and *Taenia solium* taeniasis (tapeworm and tapeworm eggs) at levels found in the developing world. The highest prevalence was found among laborers residing in farm labor camps in the county [DeGiorgio, 2005]. This is a disease acquired by migrant workers in their countries of origin, but its dissemination in the U.S. may be associated with poor sanitation and food preparation facilities.

- Two dozen residents, primarily farm laborers, of squatter housing adjacent to a coastal lagoon in northern San Diego County became ill in an outbreak of malaria, and its rapid spread was partly attributed to squalid living conditions [United States, Centers for Disease Control, 1990].

There are two issues raised by survey research on farm labor housing and health in California that require additional discussion. Most county-based surveys find evidence of overcrowding and sub-standard housing conditions. The literature includes a considerable body of material addressing associations between overcrowding and health,

and between sub-standard housing conditions and health, but there are no reports specifically addressing farm labor regarding these factors.

One review article suggests that multiple environmental exposures, including housing quality and residential crowding, contribute to the lower health status of persons in poverty [Evans, 2002]. A British report relying on the National Childhood Development Study finds evidence that cumulative experience of poor housing conditions throughout childhood is significantly associated with ill health [Marsh, 2000]. A major monograph includes reviews of epidemiological studies of health outcomes associated with housing conditions in Europe [Burridge, 1993].

A review of the development of atopy and asthma among migrants from less developed countries to the industrialized world indicates that lifestyle and environmental factors facilitate development of these diseases, and the effect is time dependent [Rottem, 2005]. A similar review of the data on U.S. Hispanic residents suggests that poor housing conditions are an important factor in the development of asthma [Hunninghake, 2006].

The issue of overcrowding is complex. A review article finds the density standard for crowded living conditions in the U.S. has repeatedly been lowered over the years, changing from 2.0 persons per room (PPR) in 1940 to 1.5 PPR in 1950 and, finally, to the current 1.0 PPR in 1960 [Myers, 1996]. Interestingly, the same review finds that a century earlier, crowding was measured by the *number of households* sharing a dwelling, which resonates with the CAWHS finding that 42% of farm laborers have multiple households in a single dwelling.

A discussion of the contemporary crowding standard through the national sociology listserv led to useful comments from a number of scholars.³ All agreed the present standard is arbitrary and likely reflects societal views of the balance between privacy needs and deeply held cultural values. One comment suggested the imposition of an arbitrary standard by an elite may reflect fears of increasing masses of the poor, whether immigrant or not. Another pointed out that living alone as an immigrant farm laborer might be more stressful than living in crowded conditions. There was general agreement among scholars that asking farm laborers about their views of crowding would be the most informative way to proceed.

There is strong evidence of the importance of cultural factors as predictors of crowding. California has experienced some notable increases in residential crowding in recent decades. A detailed analysis of householder characteristics (sex, marital status, income, education, race and ethnicity, housing tenure and region) found that only nativity was significantly associated with crowding [Moller, 2002]. That is, California households headed by foreign-born persons were much more likely to be crowded than those headed by U.S. born persons. The authors find "...households headed by foreign-born Hispanics were 26 times more likely to be crowded than those headed by native-born Whites."

A review of the world literature on the relationship between overcrowding and health status indicates a strong association between overcrowding and the prevalence of

³ The authors are grateful to Prof. Lynn Lofland, Department of Sociology, University of California, Davis, for her assistance in posting an inquiry on the national sociology listserv concerning the arbitrary nature of the crowding standard. Several scholars suggested citations in the social science literature that were particularly helpful.

tuberculosis, and weak associations have been found between overcrowding and various adverse health outcomes among children, including mental health outcomes [Brown, 2004]. One study, in particular, found the type of housing children inhabit alters mental health correlates with residential crowding [Evans, 2002].

Finally, there is a complex relationship, as yet only studied on a limited basis, between socio-economic status, housing conditions, and health. A recent review of the worldwide health and social science literature indicates that few studies have been based on population-based survey research [Dunn, 1999]. It was concluded that the emerging recognition of health inequalities requires more rigorous investigation.

In this context, there is a lack of uniform standards in assessing housing health hazards, which inhibits development of suitable protocols for collection of environmental samples or measurements. The development of uniform standards will be an important part of addressing health issues arising from housing conditions [Jacobs, 2006].

Policy Recommendations

Recommendation 1. There is a pressing need for substantial research on the status of farm labor housing in California, both the extent of the supply and its physical condition. Best practices in the various categories of the housing supply should be highlighted. It is extremely important to focus on a clear definition of hired farm workers in this research: persons directly performing farm tasks, on a farm, to produce an agricultural commodity, crop or livestock, intended for sale. Some housing initiatives mistakenly identify “agricultural workers” as the target population, which then includes many non-farm workers such as those engaged in off-farm food processing. One key informant pointed out that wine tasting room staff qualified for “agricultural worker” housing in a local project funded using a combination of public and private funds.

Recommendation 2. A robust, on-going research program focused on the health status of hired farm workers in California and possible relationships with sub-standard housing conditions should be undertaken. Special attention is needed to determine the prevalence of health hazards associated with housing conditions. An important first task in this effort will be the development of uniform standards for assessing hazards. Both cross-sectional and prospective cohort studies are needed to enable investigators to determine the relative importance of risk factors to the observed patterns of disease: environmental exposures, workplace exposures, and personal risk behaviors. For issues such as TB and other infectious diseases, this is critical because they represent a potential risk for widespread dissemination of disease beyond the farm worker population.

Recommendation 3. The public health workforce of California needs to be strengthened, especially to address the needs of the farm worker population. The failure of the state’s public health system to intercept and treat a farm laborer with active TB in Santa Barbara County contributed to the infection of dozens of other persons [NewsRX, 2004].

Recommendation 4. Strengthen enforcement of health standards for farm labor housing in California. Promote coordination and cooperation between federal, state and local agencies with responsibility for assuring that existing farm labor housing meets minimum standards. Additional funding should be made available to bring together environmental health officers, public health leaders and enforcement staff to target regions with a long-standing history of violations. The EPA Region 9 study of non-compliance with the Safe Drinking Water Act includes a listing of labor camps found to be non-compliant. At minimum, this could be a starting point for enforcement actions. This initiative should also secure a modest supply of temporary mobile home units to provide shelter for workers who may be displaced from their residences owing to failure to comply with safety and health regulations.

Recommendation 5. Create state-mandated shortcuts for the approval of housing intended to serve hired farm workers in counties where there is a demonstrable and substantial unmet demand for safe and affordable housing. At present, local

jurisdictions can block otherwise well-conceived projects through the usual planning approval process (“NIMBY” responses can delay or block otherwise qualified projects, which can then lead to expensive and time-consuming litigation). One possible mechanism would be to link new state funding for farm labor housing to circumvention of local zoning. Consideration should be given to additional incentives, such as fee waivers and reduced development standards.

Recommendation 6. Create positive incentives for enhancing the supply of farm labor housing by granting indirect housing-related preferences to communities undertaking new initiatives to meet farm labor housing needs. These could include granting to such communities preferences for bond funds to improve local infrastructure, such as parks, schools, roads and other civic improvements.

Recommendation 7. Provide a permanent funding source to eliminate barriers to, and increase the supply of, affordable housing and improve existing housing conditions, especially for unaccompanied workers. The state is contemplating issuing substantial amounts of bonds to fund new infrastructure and should include new housing for farm laborers in this initiative. Some farm labor housing projects, such as the Everglades Community Association (Homestead, Florida) have had significant success integrating single-family residences with mobile trailers serving unaccompanied workers. A health clinic, modest store and credit union, coin-operated laundry, and multi-room community center offering classes in a wide range of topics, from ESL to modern dance, has enhanced the civic life of this community. Rather than rely on enforcement of regulations, it has been found that social relations among residents enriches everyone’s life through appropriate conduct.

Recommendation 8. The State of California, through the office of the Governor and the Legislature should actively oppose the use of housing vouchers as an option under existing or proposed guest worker visa programs in agriculture. There is no evidence that vouchers are a satisfactory method of assuring safe and affordable housing for farm laborers. A key informant interviewed in the research for this paper indicated that the availability of such vouchers would provide an unprecedented opportunity for entrepreneurial labor contractors or their agents to marshal large numbers of used or discarded trailers and jam in as many workers as possible.

Recommendation 9. The State of California, through the legislature, should make it clear that public funds shall not be made available to farm employers who wish to provide housing for their employees. There is a potential risk to employees of having their housing situation controlled by their employers. For this reason, it is wiser to use public funds to support housing initiatives that are independent of specific employers. On the other hand, new incentives, including tax incentive, should be made available to private parties, including farm employers, who undertake initiatives to provide housing for hired farm laborers, provided they have substantial track records of providing safe and affordable housing, not irregular housing, such as tents or yurts.

References

Aguirre Division, JBS International, *The California Farm Labor Force Overview and Trends from the National Agricultural Workers Survey*, Burlingame, June 2005.

Aguirre Division, JBS International, *National Agricultural Workers Study. Public Access Data. Weighted Variables – Periods of Two Fiscal Years. California*, Burlingame, June 2005.

Applied Survey Research, *Farmworker Housing and Health: Monterey and Santa Cruz Counties*, “Executive Summary,” Salinas, California, 2001.

Bade B, *Migrant Farmworker Needs Assessment*, University of California Cooperative Extension, December 1989.

Bradman A, Chevrier J, Tager I, Lipsett M, Sedgwick J, Macher J, Vargas AB, Cabrera EB, Camacho JM, Weldon R, Koqut K, Jewell NP, Eskanazi B, “Association of housing disrepair indicators with cockroach and rodent infestations in a cohort of pregnant Latina women and their children,” *Environ Health Perspect*, 113(12):1795-1801 (2005).

Bradman A, Whitaker D, Quiros L, Castorina R, Henn BC, Nishioka N, Morgan J, Barr DB, Harnly ME, Brisbin JA, Sheldon LS, McKone TE, Eskanazi B, “Pesticides and their Metabolites in the Homes and Urine of Farmworker Children Living in the Salinas Valley, CA,” *J Expo Sci Environ Epidemiol*, May 31, 2006 (pre-publication web distribution).

Bradman MA, Harnley ME, Draper W, Seidel S, Teran S, Wakeham D, Neutra R, “Pesticide exposures to children from California's Central Valley: results of a pilot study,” *J Expo Anal Environ Epidemiol*, 7(2):217-234 (1997).

Brown, *The Impact of Overcrowding on Health and Education: A Review of the Evidence and Literature*, Housing Research Summary, No. 210, Office of the Deputy Prime Minister, London, United Kingdom, 2004.

Burridge R, Ormandy D, eds., *Unhealthy Housing. Research, Remedies, Reform*, E and FN Spon, London, 1993.

California. Assembly, “Farmworker Housing,” 2000. cf. <http://www.assembly.ca.gov/acs/committee/c12/publications/2000report/farmworkerhousing.htm>

California. State Department of Employment, Research and Statistics Section, *California Employment and Payrolls*, Report 127, Sacramento, Quarterly, 1975, 1976, 1977; California. Department of Employment Development, Labor Market Information Division, *Agricultural Bulletin*, Sacramento, Monthly, 1999, 2000, 2001. Also: <http://www.calmis.ca.gov/htmlfile/subject/agric.htm>

California. Department of Housing and Community Development, *Migrant Farmworker Housing in California*, Sacramento, California, 1988.

California. Department of Housing and Community Development, *Operation of Farm Labor Housing in California: A Survey of Farmers and Ranchers*, Working Group on Agriculture and Affordable Housing, Sacramento, California, 2001.

California. Farm Worker Services Coordinating Council. "Final Report," Sacramento, California, November 1992.

California. Senate Committee on Housing and Land Use. "Farmworker Housing. A Background Staff Paper for the Interim Hearing of the Senate Committee on Housing and Land Use," Fresno, California, October 23, 1995.

California. Senate Committee on Housing and Land Use. "Farmworker Housing. A Summary Report from the Interim Hearing of the Senate Committee on Housing and Land Use," Fresno, California, October 23, 1995.

The California Endowment, *Learnings from the Agricultural Worker Health and Housing Program*, December 12, 2003.

California Institute for Rural Studies, *California Agricultural Workers Survey*, Survey Instrument, 1999, available on-line at: <http://cirsinc.org/recent.html> (cf. CAWHS Survey Instruments).

Ciesielski SD, Seed JR, Esposito DH, Hunter N, "The epidemiology of tuberculosis among North Carolina migrant farm workers," *JAMA*, 265(13):1715-1719 (1991).

Curl CL, Fenske RA, Kissel JC, Shirai JH, Moate TF, Griffith WC, Coronado GD, "Evaluation of take-home organophosphorus pesticide exposure among agricultural workers and their children," *Environ Health Perspect*, 110(12):A787-A792 (2002).

DeGiorgio C, Pietsch-Escueta S, Tsang V, Corral-Leyva G, Ng L, Medina MT, Astudillo S, Padilla N, Leyva P, Martinez L, Noh J, Levine M, del Villasenor R, Sorvillo F, "Sero-prevalence of *Taenia solium* cysticercosis and *Taenia solium* taeniasis in California, USA," *Acta Neurol Scand*, 111(2):84-88 (2005).

Dunn JR, "Housing and Health Inequalities: Review and Prospects for Research," *Housing Studies*, 15(3):341-366 (1999).

Early J, Davis SW, Quandt SA, Rao P, Snively BM, Arcury TA, "Housing characteristics of farmworker families in North Carolina," *J Immigr Minor Health*, 8(2):173-184 (2006).

Evans GW, Kantrowitz E, "Socioeconomic status and health: the potential role of environmental risk exposure," *Ann Rev Pub Health*, 23:303-331 (2002).

Evans GW, Lercher P, Kofler WW, "Crowding and children's mental health: the role of house type," *J Environ Psych*, 22(3):221-231 (2002).

Frisvold G, Mines R, Perloff JM, "The Effects of Job Site Sanitation and Living Conditions on the Health and Welfare of Agricultural Workers," *Amer J Ag Econ*, 70(4):875-885 (1988).

Goldman L, Eskanazi B, Bradman A, Jewell NP, "Risk behaviors for pesticide exposure among pregnant women living in farmworker households in Salinas, California," *Am J Ind Med*, 45(6):491-499 (2004).

Holden C, "Bitter Harvest: Housing Conditions of Migrant and Seasonal Farmworkers," Chapter 6, *The Human Cost of Food: Farmworkers' Lives, Labor and Advocacy*, Thompson CD Jr, Wiggins MF, editors, University of Texas Press, Austin, TX, 2002.

Housing Assistance Council, *Taking Stock: Rural People, Poverty and Housing at the Turn of the 21st Century*, Washington, DC, December 2002. See especially, "Farmworkers Case Study: Kern County, California."

Hunninghake GM, Weiss ST, Celedon JC, "Asthma in Hispanics," *Am J Respir Crit Care Med*, 173(2):143-163 (2006).

Jacobs DE, "A qualitative review of housing hazard assessment protocols in the United States," *Environ Res*, (2006).

Lambert WE, Lasarev M, Muniz J, Scherer JA, Rothlein J, Santana J, McCauley L, "Variation in organophosphate pesticide metabolites in urine of children living in agricultural communities," *Environ Health Perspect*, 113(4):504-508 (2005).

Magaña CG, Hovey JD, "Psychosocial stressors associated with Mexican migrant farmworkers in the midwest United States," *J Immigr Health*, 5(2):75-86 (2003).

Marsh A, Gordon D, Heslop P, Pantazis C, "Housing Deprivation and Health: A Longitudinal Analysis," *Housing Studies*, 15(3):411-428 (2000).

Martin P, *Napa Farm Workers and their Housing Needs*, Davis, California, March 16, 2002.

McCauley LA, Lasarev MR, Higgins G, Rothlein J, Muniz J, Ebbert C, Phillips J, "Work characteristics and pesticide exposures among migrant agricultural families: a community-based research approach," *Environ Health Perspect*, 109(5):533-538 (2001).

McCurdy SA, "Tuberculin reactivity among California Hispanic migrant farm workers," *Am J Ind Med*, 32(6):600-605 (1997).

Meister JS, "The Health of Migrant Farm Workers," *Occ Med State of the Art Reviews*, 6(3):503-518 (1991).

Moller RM, Johnson H, Dardia M, *What Explains Crowding in California?*, California Research Bureau, Sacramento, California, February 2002.

Myers D, Baer WC, Choi S-Y, "The changing problem of overcrowded housing," *J Amer Plan Assoc*, 62(1):66-84 (1996).

Napa Valley Vintners, January 9, 2003,
http://www.napavintners.com/news/release.asp?ID_News=37

National Fair Housing Advocate Online, "Farmworkers and county settle housing discrimination case," May 23, 2000,
<http://www.fairhousing.com/index.cfm?method=page.display&pageID=700>

NewsRX Web Site, "Farmworker pleads no contest after evading tuberculosis treatment,"
<http://www.newsrx.com/newsletters/Tuberculosis-Week/2004-08-16/081620043334TB.html>, 2004.

Palerm JV, *Immigrant and Migrant Farm Workers in the Santa Maria Valley, California*, Bureau of the Census, Center for Survey Methods Research, Washington, D.C., September 1994.

Peck S, *California Farm Worker Housing*, California Institute for Rural Studies, Davis, California, 1989.

Peoples SA, Maddy KT, Cusick W, Jackson T, Cooper C, Frederickson AS, "A Study of Samples of Well Water Collected from Selected Areas of California to Determine the Presence of DBCP and Certain Other Pesticide Residues," *Bull Environm Contam Toxicol*, 24:611-618 (1980).

Peoples' Self-Help Housing Corporation, *San Luis Obispo County Farm Worker Housing Needs Study*, San Luis Obispo, California, 1990.

Quandt SA, Arcury TA, Rao P, Snively BM, Camann DE, Doran AM, Yau AY, Hoppin JA, Jackson DS, "Agricultural and residential pesticides in wipe samples from farmworker family residences in North Carolina and Virginia," *Environ Health Perspect*, 112(3):382-387 (2004).

Rottem M, Szyper-Kravitz M, Shoenfeld Y, "Atopy and asthma in migrants," *Int Arch Allergy Immunol*, 136(2):198-204 (2005).

San Diego City Council, *Results of the Multi-Jurisdictional Conference on the Farmworker and Day Laborer Housing Crisis (San Diego, California, February 21, 1991)*, San Diego, California, February 21, 1991.

Sherman J, Villarejo D, Garcia A, McCurdy SA, Mobed K, Runsten D, Saiki K, Samuels S, Schenker M, *Finding Invisible Farm Workers: The Parlier Survey*, California Institute for Rural Studies, Davis, California, March 1997.

Snyder JG, Buchan R, Salman MD, Ogg JE, Sandfort DR, “Prevalence of Positive Tuberculosis Tests Among Migrant Farm Workers in Northeastern Colorado,” *Proceedings of the Second National Conference of NIOSH-Sponsored Agricultural Health and Safety Centers*, High Plains Intermountain Center for Agricultural Health and Safety, Fort Collins, Colorado, March 27-28, 1995, pp. 110-116.

United States. Department of Commerce, Bureau of the Census, *1974 Census of Agriculture*, op. cit., “Table 5. Farm Production Expenses: 1974, 1969, and 1964,” p. I-16; United States. Department of Agriculture, National Agricultural Statistics Service, *2002 Census of Agriculture*, op. cit., “Table 4. Farm Production Expenses: 2002 and 1997,” pp. 10ff.

United States. Department of Commerce, Bureau of the Census, *1974 Census of Agriculture*, op. cit., “Table 18. Farm Payroll and Employment: 1974, 1969, and 1964,” p. I-3; United States. Department of Agriculture, National Agricultural Statistics Service, *2002 Census of Agriculture*, op. cit., “Table 55. Summary by Size of Farm: 2002,” pp. 55ff (see item “Hired Farm Labor,” p. 70).

United States. Department of Commerce, Bureau of the Census, *Census of Population, 1980: Equal Employment Opportunity Special File*, Computer File, Distributed by UC Data Archive and Technical Assistance, University of California, Berkeley, 2004. Cf. Tables P9 and P23; United States. Department of Commerce, Bureau of the Census, *1990 Census of Population. Social and Economic Characteristics. California*, Section 1 of 4, Report No. 1990 CP-2-6, Washington, 1993. Cf. “Table 25. Occupation of Employed Persons: 1990,” p. 159; United States. Department of Commerce, Bureau of the Census, *Census 2000 Summary File 4 (SF 4)*, <http://factfinder.census.gov/servlet/> Cf. “PCT86. Sex by Occupation for the Employed Civilian Population 16 Years and Over.”

United States. Department of Health and Human Services, Centers for Disease Control, “Transmission of Plasmodium vivax malaria--San Diego County, California, 1988 and 1989,” *Mob Mort Wkly Rep*, 39(6):91-94 (2000).

United States. Department of Labor, *National Agricultural Workers Survey 1999*, Survey Instrument, Rev. 6/15/99, Spanish, Ver. 2, Cycle 34, Summer 1999, OMB 1225-0044.

United States. Department of Labor, *Findings from the National Agricultural Workers Survey (NAWS) 2001-2002: A Demographic and Employment Profile of United States Farm Workers*, Research Report No. 9, Office of Assistant Secretary for Policy, Office of Programmatic Policy, March 2005.

United States. Environmental Protection Agency, Region 9, *An EPA Region 9 Survey of California Labor Camps in Violation of the Safe Drinking Water Act*, San Francisco, California, July 1991.

Ventura County, *Farmworker Housing Study*, Resource Management Agency, Planning Division, Ventura, California, August 6, 2002.

Villarejo D, Runsten D, *California's Agricultural Dilemma: Higher Production and Lower Wages*, California Institute for Rural Studies, Davis, California, December 1993.

Villarejo D, Lighthall D, Williams III D, Souter A, Mines R, Bade B, Samuels S, McCurdy SA, *Suffering in Silence: A Report on the Health of California's Agricultural Workers*, California Institute for Rural Studies & The California Endowment, November 2000.

Villarejo D, Schenker M, *Policies to Improve the Health and Well-Being of California's Hired Farm Laborers*, California Program on Access to Care, California Policy Research Center, Berkeley, California, November 17, 2005.

Zabin C, Kearney M, Garcia A, Runsten D, Nagengast C, *Mixtec Migrants in California Agriculture*, California Institute for Rural Studies and Center for U.S.-Mexican Studies, University of California, San Diego, March 1993.