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The Need for Targeted Surveys of Farmworkers:

A Comparison of the California Health Interview Survey (CHIS) and the California Agricultural Worker Health Survey (CAWHS)

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Executive Summary

Farmworkers in California are an extremely vulnerable population. They face a multitude of barriers to access health and social services. And, despite the fact that many farmworkers have resided in the United States for long periods, they are the least assimilated of all immigrant groups. The median family income may be lower than $10,000 a year and they are very poorly connected to U.S. safety net institutions. Farmworkers are truly a unique population that requires specialized studies and programs to attend to its particular needs.

For this report we analyzed data gathered by the California Health Interview Survey (CHIS) conducted by UCLA's Center for Health Policy Research. We compared the CHIS data to the California Agricultural Workers Health Survey (CAWHS) data that the California Institute for Rural Studies (CIRS) collected from face-to-face interviews with farmworkers. To conduct the analysis, CIRS compared the CHIS and CAWHS data sets on a number of variables, including personal characteristics, rates of health insurance coverage, participation in public programs, health and dental utilization, and health status of both farmworker adults and their children.

Results indicate that while almost a quarter of the CHIS sample has an annual household income above $30,000, only 5 percent of the CAWHS sample has that high an income level. Additionally, more than one-third of the CAWHS sample has an annual income of less than $10,000, while only half as many (16 percent) of the CHIS sample is that poor. More than one-third of the CHIS are U.S. citizens, while only just over one-tenth of the CAWHS are U.S. citizens.

Additional evidence that the CHIS under-represents farmworkers was found when we compared rates of health insurance and MediCal enrollment. In the CAWHS, three-quarters of the adults and half of the children are uninsured, compared to 39 percent of adults and 17 percent of the children in the CHIS. Similarly, while more than one-third of CHIS have employer-sponsored health insurance, only slightly more than one-tenth of CAWHS adults have insurance through an employer. And, despite the fact that the CAWHS sample has significantly lower levels of income, and thus should have greater levels of entitlement to public programs, enrollment in MediCal is much higher for both CHIS adults and children than CAWHS adults and children.

More support for our argument can be found if we look to utilization rates of medical care. One quarter of CAWHS adults and one-tenth of CAWHS children have never seen a medical doctor, as compared to only 2 percent of CHIS adults and 1 percent of CHIS children. Three-quarters of CHIS adults, and less than half of CAWHS adults, had a visit with a medical doctor in the 12 months prior to the survey.

Cross-tabulation analyses of the data sets using more subtle comparisons serves to magnify the finding of bias toward the better off in the CHIS. By demonstrating that the CAWHS had greater variation across the same variables than the CHIS in crosstabular analysis, the analysis provides further evidence of bias. Additionally, in the crosstabular

analysis we demonstrate that both data sets are quite consistent across many variables where this would be expected. Lastly, although the universe that the CHIS is sampling from appears to be a biased subsample of the full universe of farmworkers represented in the CAWHS, our analysis finds that both surveys are inherently valid for the populations that they are measuring.

Our analysis demonstrates that conventional statewide surveys designed for the general population will inevitably select a biased sample of farmworkers. This bias takes the form of under-representing that portion of the farmworker population that has lower income and less access to services than their more fortunate fellow workers.

The bias derives from the nature of the population and the challenges of doing accurate data collection among this group. Many live in crowded housing as roomers with relatives, crowded in all-male "crash pads", in garages, and in trailers and cars near where other farmworkers live. If the surveyor telephones or goes to the door the residence, the person who answers will most likely be the most settled resident of the house or apartment, who will not have any incentive to identify others living in or near their home. Consequently, surveys not customized for farmworkers have an unavoidable bias against the poorest among them. These same excluded people are likely to be those most neglected by social services.

The bias described above portrays the problems and needs of this population in a distorted manner. Thus, policy-makers and program designers should not rely solely on non-customized survey data to develop policy and programs for California's farmworkers, as it leads to an inaccurate view of what services are needed and how to make those services effective among farmworkers.

The findings show that the CHIS under-represents the more disadvantaged farmworkers and over-represents the more settled part of the farmworker population that enjoys greater access to U.S. institutions. While the statewide health telephone survey (CHIS) succeeded in interviewing a significant number of farmworkers, the sample that was reached is not fully representative of the entire population. The population that is partially excluded is lower income, has lower educational attainment, has lower rates of health insurance coverage, has less secure immigration status, has lower enrollment in public safety net programs and lower utilization of medical and dental service. The under-represented population faces higher barriers in numerous areas thus we make the following recommendations:

- While they may be valid for the population they represent, the CHIS data should not be used to develop programs and policies for farmworkers in California as they are not representative of this extremely marginal and hard-to-reach population.

- CHIS data on other marginalized and hard-to-reach populations may be biased in the same way that the CHIS data are biased for farmworkers. Therefore, one should exercise caution in using the CHIS data to conduct

research and develop policy and programs for these populations (i.e. homeless) and for other occupational categories that are dominated by poorly assimilated immigrant populations, which include among others: restaurant workers, construction clean-up crews, gardening crews, and sheetrock workers.

- Policies and programs specific to farmworkers are needed because the population is so different even from farmworkers sampled in a randomized fashion by telephone.

- More face-to-face customized surveys to collect health care access and utilization information from marginalized populations should be undertaken.

- Any survey of farmworkers based on a household sample must be preceded by a thorough enumeration of the neighborhoods where farmworkers live.

Introduction:

Farmworkers are the most vulnerable labor force in California. The best demographic data on this population, the National Agricultural Workers Survey (NAWS), shows that the population is made up of mostly young men born and raised in Mexico.[1] Over half of them are in the country without their parents, wives or children, although many of these have a wife and children in Mexico. Many of the rest have a U.S-based spouse and young children; most farmworker children are born north of the border. Despite the fact that many farmworkers have resided in the United States for a number of years, they are the least assimilated of all immigrant groups; few learn English and most have only a primary school education. The median family income is less than $10,000 a year and they have very low rates of using U.S. safety net institutions. Farmworkers are truly a unique population that requires specialized studies and programs to attend to their particular needs.[2]

This report demonstrates that conventional statewide surveys, even well designed and competently run surveys cannot be used to develop policy and program guidance for California's farmworkers. Surveys designed for the general population will inevitably select a biased sample of farmworkers. This bias takes the form of, on average, excluding that portion of the farmworker population that has lower income and less access to health care than their more fortunate fellow workers. As a result of this bias, policy and program analysts and implementers who rely on this information receive a distorted view of what services are needed and how to make those services effective among farmworkers.

We analyzed data gathered by the California Health Interview Survey (CHIS) conducted by UCLA's Center for Health Policy Research. These data are the best source of information on a whole series of topics regarding the health status of California's diverse population. Despite the rigor of the survey and its effort to reach all groups in California, when we focused on the farmworkers interviewed in the survey, we discovered that the bias mentioned above leads to a distorted view of this group's problems and needs.

Where does the bias come from?

The bias is not unique to the CHIS but also exists in the decennial U.S. census and the Current Population Survey, among other data sources. It derives from the nature of the population and the challenges of doing accurate data collection among this group.

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[1] The National Agricultural Workers Survey (NAWS) avoids the problem of possible undercounting of difficult to find people inherent in household sampling entirely by taking its sample at the employment site. In this way, a random sample of all those employed at farm work are interviewed including a large proportion of solo undocumented men.

[2] See "Who Works on California's Farms," U.S. Dept. of Labor, Research Report #7, Office of Policy, 1998. The data from the NAWS have a higher proportion of unaccompanied males than the CAWHS due to the employment-based sampling in the NAWS. Even in the CAWHS, despite an effort to cover all housing units, a lower proportion of unaccompanied males were interviewed than in the NAWS.

Farmworkers live in a variety of housing situations. Most live in crowded housing, both detached houses and apartments. Since such a large proportion of the population (over 60 percent) are solo males (men here without their parents, wives or children), many farmworkers live as roomers with relatives in anchor families or crowded in "crash pads" of all men. Also, many live in garages, trailers and cars near where other farmworkers live. These conditions make it crucial that any survey of farmworkers based on a household sample is preceded by a thorough enumeration of the neighborhoods where farmworkers live. If the surveyor or census taker goes to the door or telephones the residence, the person who answers will most likely be a permanent resident living in the house or the most settled resident of the apartment. These people will not have any incentive to identify others living in or near their home, especially since the other occupants may be undocumented or living in violation of housing codes. The result of these sociological realities is that surveys not customized for farmworkers have an unavoidable bias against the poorest among them. These same excluded people may be those most neglected by social and medical services.

The Method: A Comparison with the California Agricultural Workers Health Survey (CAWHS)

The California Institute for Rural Studies compared personal characteristics, rates of health insurance coverage and participation in public programs, health and dental utilization, and health status of both farmworker adults and their children in the CHIS and CAWHS datasets, and found significant differences across a number of dimensions. The CHIS adult sample, created by selecting occupational and industry codes that indicate agricultural workers, was 487, and the CAWHS adult sample was 966. In the CHIS, one child was randomly selected from each household; the sample size was 200. In the CAWHS, data was collected on all the children in the household. We therefore randomly selected one child from the total data set; the final CAWHS child sample size was 367 (see Detailed Methods Section in the Appendix).

One useful way to conceptualize the results of the surveys is to think of the universe captured by the CHIS as a sub-sample of that captured by the CAWHS. The CAWHS covered in a representative way all (or most) groups of farmworkers, including the most settled and the least settled, while the CHIS sampled mostly among the most settled. Of course, as we will see below, the CHIS survey obtained interviews with some families among the most impoverished as well. In other words, the bias in the CHIS is one of undercounting the more disadvantaged farmworkers.

Due to similarities in design and methodologies, the CAWHS is particularly well suited for a comparative analysis with CHIS data. Both surveys are population-based random samples designed to provide baseline measures on insurance coverage, health status and health care needs. The CHIS covers immigrant Latino/Mexican populations as well as all others; the CAWHS interviewed only farmworkers. Additionally, both surveys collected self-reported and household-level data, including information on dependent children living in the household, such as age, place of birth, health insurance coverage, health conditions, and health care utilization. This compatibility of measures allows for the

side-by-side analysis of factors that influence access to care, and in turn, the health status of the population. These factors include health insurance, income, language barriers, number of years lived in the U.S., and immigration status.

We were able to identify within the CHIS data set a sub-sample of workers whose occupation was hired farm work. And, although we could not obtain direct access to the CHIS for unrestricted comparative analysis, we were able to arrange for adequate runs done by the UCLA Center for Health Policy on the CHIS data to allow us to compare and contrast the farmworkers in the CHIS to the farmworkers in the CAWHS.

The CAWHS survey had the advantage of doing a thorough enumeration prior to the actual administering of the instrument. Each neighborhood was canvassed for cars, garages, and degree of crowding in the places of residence. As a result, interviewers were able to request a random selection of farmworkers within the household. In the case of the CHIS, the interview was conducted by telephone without an adequate prior enumeration. The result, as we demonstrate below, is that the population sampled was considerably different.

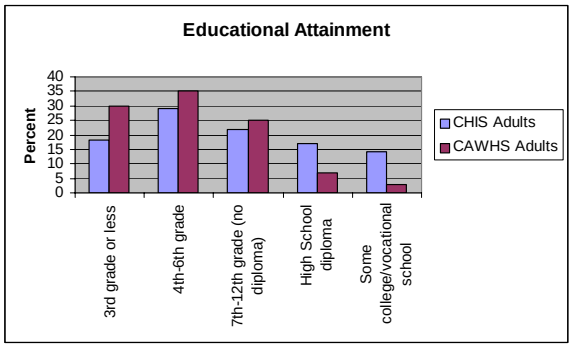
Findings from the Comparisons of CHIS and CAWHS

We reviewed various dimensions of data for the two data sets. We compared and contrasted the data for the adults and the children separately.[3] The children's data set also contains adult or parent linked variables so that we can compare the traits of the parents of children. These different types of comparisons are identified in the text.

Demographic Characteristics

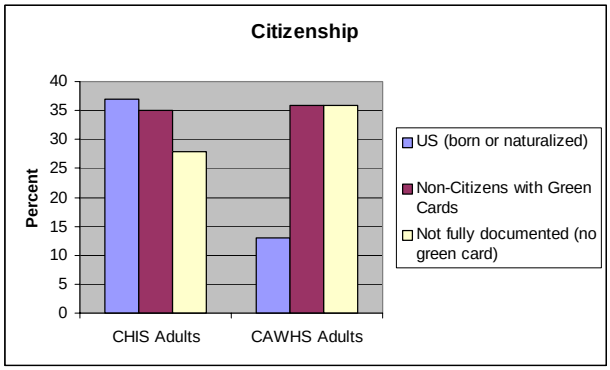
The first indication that the two samples are from overlapping but not congruent universes becomes evident by comparing the demographic characteristics of the two samples. A series of factors point to a more settled population in the CHIS universe than in the CAWHS universe. The CHIS sample is older--the median age is 40 versus 35 in CAWHS.[4] In the CHIS adult data file, 75 percent of adults are married or living with a partner, as compared to 65 percent in the CAWHS. Sixteen percent of CHIS sample have never been married, versus 28 percent of CAWHS. In the children's file, 92 percent of CHIS and 87 percent of CAWHS adult respondents for the children are married or living with a partner; only 2.5 percent of CHIS parents and 10 percent of CAWHS parents have never been married.

[3] We worked from four data sets—a child and adult data set for each of the two surveys.
[4] The proportion of women in the two samples cannot be compared since the CAWHS slightly oversampled women to obtain sufficient sample size to anlayze females.



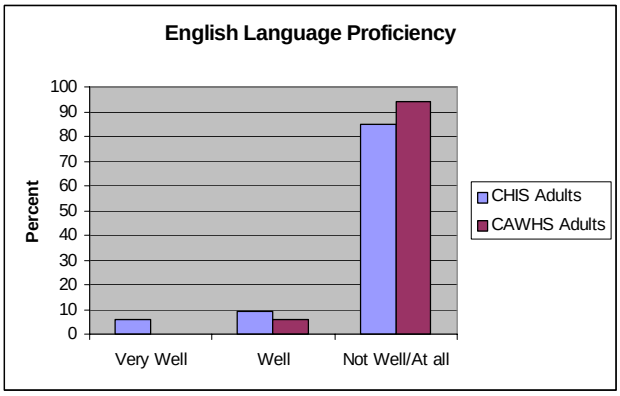
Another measure of this more settled status is that the CHIS sample has a higher educational attainment. Sixty-five percent of the CAWHS sample has less than a sixth grade level of education (half of whom have third grade or less), as compared to 47 percent of the CHIS sample with less than a sixth grade level of education (18 percent third grade or less). Thirty-one percent of CHIS has a high school diploma or equivalent, as compared to 10 percent of CAWHS. While 14 percent of CHIS sample has some college, a college degree, or has attended vocational school, only 3 percent of the CAWHS sample has that high educational attainment.

Furthermore, the CHIS sample shows signs of deeper roots in the United States. In the CHIS sample, 23 percent of the adults were born in the US and 74 percent were born in Mexico, while only 6 percent of adults in CAWHS were born in the US and 90 percent were born in Mexico. Interestingly, there are not significant differences in country of birth for children: 82 percent of both CHIS and CAWHS children were born in the United States, while the remainder was primarily born in Mexico. We will return to this fact later when we discuss service utilization.



Not surprisingly, evidence that the CHIS sample has more established roots is shown when we turn to citizenship and immigration status. Thirty-seven percent of the CHIS sample has U.S. citizenship (born and naturalized combined), as compared to only 13 percent of the CAWHS group. Unfortunately, we could not compare the proportion of undocumented farmworkers between the two surveys since the CHIS did not collect that data. But, grouping pending status with undocumented in one group, the CAWHS has more "not fully" documented people (36 percent versus 28 percent) than the CHIS.

Our analysis of the length of time foreign-born farmworkers have been in the U.S. reinforces our finding that the CHIS sample has deeper roots than the CAWHS sample. However, lthough the differences between CHIS and CAWHS are significant, they are not that large. Half of the CHIS sample has been in the U.S. 15 years or more, as compared to 40 percent of the CAWHS sample; 4 percent of CHIS and 8 percent of CAWHS have been in U.S. less than one year.



Farmworkers face enormous language barriers in accessing services. Again, the comparison shows that the CHIS sample knows more English on average than the CAWHS group. The level of English proficiency is extremely low in the CAWHS, and significantly lower than in the CHIS. In CHIS, 6 percent of the adult sample responded that they speak English "very well"; in CAWHS, not a single person responded in this way. On the contrary, 94 percent of CAWHS respondents stated that they speak English "not well or not at all", compared to 85 percent of CHIS. None of the CAWHS respondents speak only English in their homes, compared to 16 percent of the CHIS sample. This reflects the larger proportion of the CHIS sample born in the United States (23 percent). Fifty-nine percent of the CAWHS sample speaks only Spanish in the home, versus 52 percent of CHIS. Thirty-seven percent of CAWHS and 28 percent of CHIS speak both English and Spanish.

In the child data set, CAWHS parents have significantly lower levels of English proficiency than CHIS parents. Eleven percent of CHIS parents speak English very well or well, as compared to only five percent of CAWHS parents. Ninety-five percent of CAWHS parents speak English not well or not at all, versus 89 percent of CHIS parents. Only 3.5 percent of CHIS parents, and no CAWHS parents, speak only English at home. Fifty-eight percent of CHIS parents and 56 percent of CAWHS parents speak Spanish at home, while 36 percent of CHIS and 42 percent of CAWHS parents speak both English and Spanish in the home.

One important way that the CHIS and the CAWHS samples are very different is in the percentage of self-reported Hispanic adults. In the CHIS, 20 percent of the sample is non-Hispanic, whereas in the CAWHS less than 1 percent of the sample is non-Hispanic. We conducted analyses on the sub-sample of non-Hispanic adults in the CHIS, and found that they are quite different from the Hispanic population even in the CHIS. In particular, they have much greater rates of employer-based insurance (45 percent) and private insurance (20 percent) than the Hispanic CHIS sample (33 percent and 6 percent respectively). They are both more educated and enjoy much higher levels of income than the Hispanic CHIS group. For example, 48 percent of the non-Hispanics have some college or vocational training, and an additional 38 percent have a high school diploma. Among the Hispanic CHIS sample, 5 percent have some college and 13 percent have a high school diploma. Sixty-two percent have an annual income of more than $30,000 among the non-Hispanics while only 13 percent of the Hispanics do.

We hypothesize that this sub-population is largely made up of tractor drivers, foremen, supervisors and other semi-skilled and skilled workers. But, they appear to be represented out of proportion to their true representation in the population. This sub-

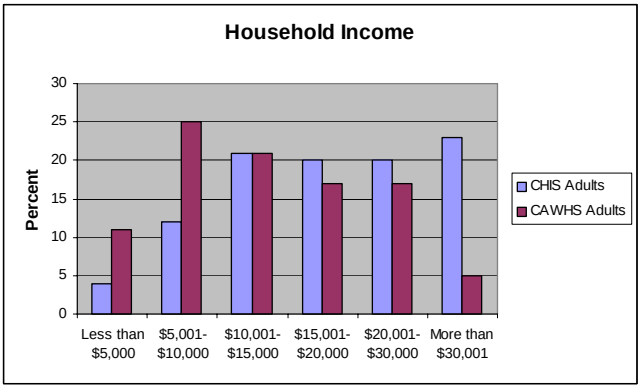
sample, that only has a very small overlay with the CAWHS, is one of the factors creating a bias in the CHIS. However, even when we compare the CHIS without the non-Hispanic subsample to the CAWHS, the CHIS population still represents a population with higher income and education levels, lower rates of insurance (particularly employment based and privately purchased)[5], and greater language proficiency than the CAWHS sample.

Access Variables: Income, Health Insurance Coverage, Public Program Participation

A comparison of the demographic characteristics for the two samples shows them to be considerably different. The CHIS sample is somewhat older, more likely to be married, has higher a level of education, is more likely to have been born in the United States, and has stronger English language skills. These differences become even more obvious when we turn to the relationship between these demographic characteristics and the factors that enable farmworkers to access health care such as income, health insurance coverage, and enrollment in public safety net programs. Without sufficient enabling factors, farmworkers and their children are unlikely to be able to access health care services. If our hypothesis is correct, CAWHS farmworkers and their children should have lower rates of utilization. Lower utilization rates could lead to a multitude of problems including children who do not receive preventive services such as childhood vaccinations, diseases that go undetected, and an overuse of emergency services.

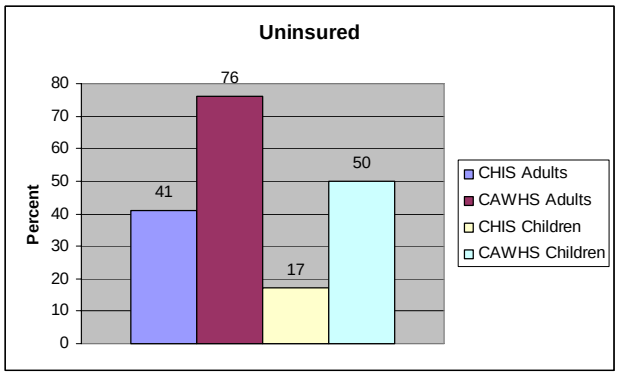
Income:

When we examined household income levels, we found that the CAWHS farmworkers are significantly poorer than in the CHIS sample. Thirty-six percent of the CAWHS sample has an annual household income of less than $10,000, whereas only 16 percent of CHIS sample have such a low annual income. Approximately 62 percent of the CHIS and 65 percent of the CAWHS sample have household income levels between $10,000 and $30,000, and while 23 percent of CHIS sample have a household income above $30,000, only 5 percent of the CAWHS sample earns over $30,000 per year.

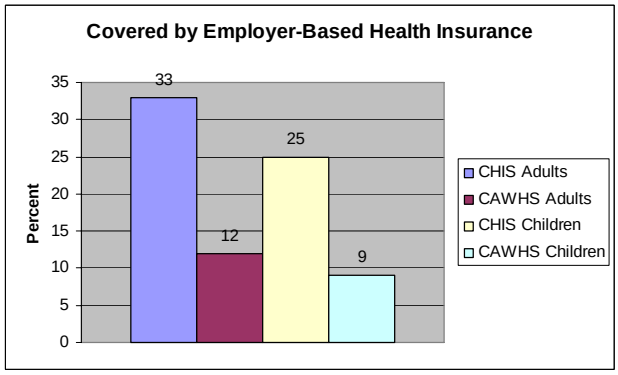


[5] For example, the insurance rate of the Hispanics in the CHIS is 56% vs. 25% in the full CAWHS sample.

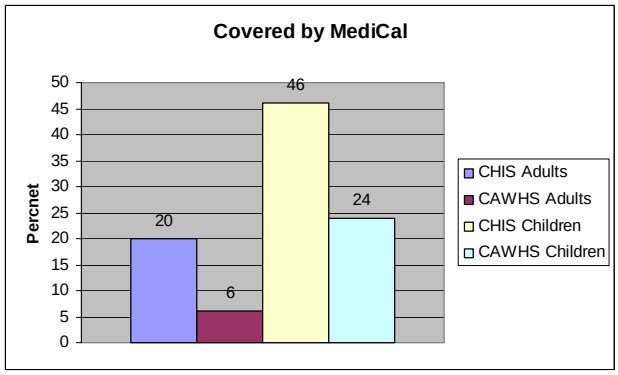
Health Insurance Coverage:



The farmworkers represented in CAWHS have less than half the rate of health insurance coverage and their families have much lower rates of participation in public programs than the population represented in CHIS. Only 25 percent of adults in CAWHS have any type of health insurance, as compared to 61 percent of CHIS adults. If we turn to the data on children, we find that half of the children in CAWHS have health insurance, but that is significantly lower than the 83 percent of children in CHIS that have health insurance. Twenty-nine percent of CAWHS parents have some type of health insurance, while more than twice (66 percent) of CHIS parents have health insurance.



While rates of employment between CHIS and CAWHS are similar, only a third as many CAWHS adults have employer-based health insurance as CHIS adults (12 percent versus 35 percent). Similarly, CAWHS children have much lower rates of employer-based health insurance than CHIS children (24 percent versus 9 percent).



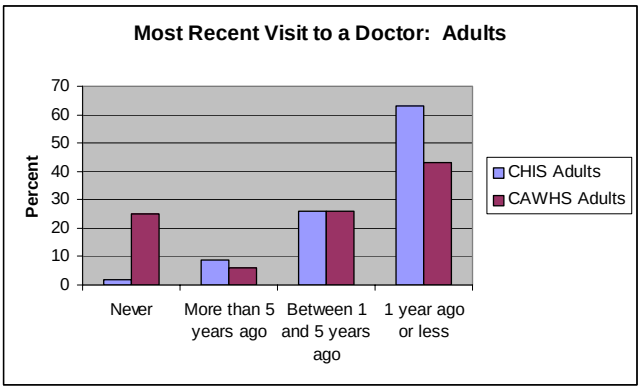
Although poorer than the CHIS sample, CAWHS adults and children have significantly lower rates of enrollment in MediCal than CHIS adults and children (6 percent versus 20 percent respectively for the adults, and 24 percent versus 46 percent respectively for the children). Very few adults or children in either sample have privately purchased health insurance.

Public Program Participation:

For adults in both the CHIS and CAWHS samples, there are relatively low rates of participation in public programs such as Temporary Assistance to Needy Families and CalWorks. Very few farmworkers from either sample receive public housing subsidies, and very few are beneficiaries of Social Security Disability or Supplemental Security Income.

However, the farmworker population does use some public programs. It should be remembered here that since the CAWHS sample is much poorer than the CHIS sample, more in the CAWHS group should be eligible for income-sensitive public programs. One should recall in this context that the same proportion of children were born in the United States in both samples and as such are U.S. citizens. For this reason, the higher rates of enrollment in these programs by the CHIS, rather than the CAWHS group is quite surprising. The differences are not great in food stamps; fewer CAWHS adults receive food stamps than CHIS adults (8.5 percent versus 12 percent), while the same proportion of children in CAWHS and CHIS receive food stamps (18 percent). However, significantly more CHIS children (61 percent) are enrolled in WIC[6] than CAWHS children (37 percent).

Doctor Visits and Health Status:



When we look at utilization of medical and dental services, we find more support for the argument that the CHIS sample underestimates the severity of problems that farmworkers face. Both adults and children in the CAWHS data set had significantly lower utilization rates for medical and dental care. Twenty-five percent of the adults in CAWHS have never seen a doctor, whereas only 2 percent of CHIS adults have never seen a doctor. Sixty-three percent of CHIS adults had a visit with a medical doctor in the past 12 months, as compared to 43 percent of CAWHS adults.[7]

Adults in CHIS had higher rates of diagnosed chronic diseases as compared to adults in CAWHS. For instance, 11 percent of CHIS adults have been diagnosed with arthritis, as compared to 7 percent of CAWHS adults. While 6 percent of CHIS adults have been diagnosed with asthma, only 2 percent of CAWHS adults have been diagnosed with asthma. Similarly, 14 percent of CHIS adults have been diagnosed with high blood pressure, as compared to 8 percent of CAWHS adults. One of the effects of underutilization of health care services is that diseases go undetected, and therefore untreated. By the time these conditions are diagnosed, they tend to be much more serious, more difficult, and more expensive, to treat.[8]

CAWHS children also had much fewer visits to a medical doctor than CHIS children, providing further support for the argument that the absence of enabling factors such as insurance and parents with English language skills leads to lower utilization rates.

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[6] This may be explained by the fact that WIC has a higher income cutoff than food stamps so that the CHIS sample is eligible despite a higher income than the CAWHS sample.

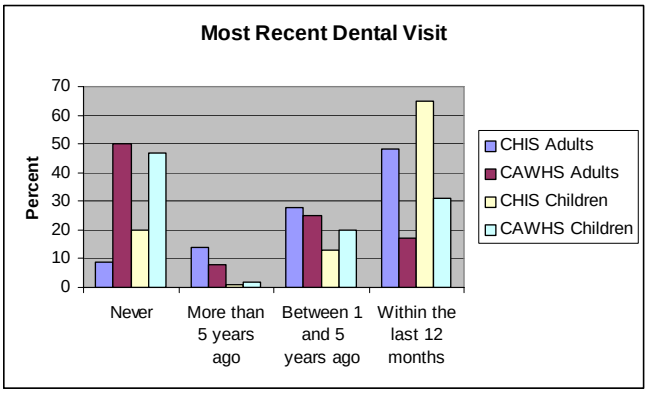
[7] This population is subject to chronic diseases and lack of prevention and consistent treatment are serious problems.

[8] Small numbers in both surveys of children reported diseases.

Eleven percent of CAWHS children have never seen a medical doctor, compared to just 1 percent of CHIS children.[9] While 86 percent of CHIS children had a doctor visit in the 12 months before the survey, only 70 percent of CAWHS children did. As part of regular well-child and preventive care, children under the age of 11 should be having annual check-ups. The fact that 11 percent of children in CAWHS have never seen a medical doctor is quite disturbing. It implies that those children have not received the recommended childhood vaccinations. Additionally, children who have never seen a doctor may have any of a number of serious childhood illnesses that have not been diagnosed or treated.

Low utilization of medical care in the U.S. are not offset by high numbers of farmworkers seeking medical care in other countries in either the CHIS or CAWHS sample (12 percent and 13 percent, respectively), nor do parents take their children to other countries for medical care (3 percent in both samples).

Dental Visits:



The patterns of utilization of dental services across the CHIS and CAWHS samples differ in the same way as utilization of medical services. While almost two-thirds of CHIS children saw a dentist in the year before the survey only one quarter of CAWHS children did[10]. Forty-seven percent of CAWHS children have never seen a dentist, as compared to 17 percent of CHIS children. Adults in CAWHS also had significantly lower rates of dental visits than adults in CHIS. Only 17 percent of CAWHS adults had a dental visit in the past 12 months, as compared to 48 percent of CHIS adults. A full 50 percent of CAWHS adults have never had a dental visit, whereas only 9 percent of CHIS adults have never had a dental visit.

Cross-Tabulation Analyses

In this section like in the previous one, we attempt to demonstrate that the CHIS sample is in large measure a more established sub-sample of the farmworkers. The CHIS sample is biased toward the better off, more settled farmworkers and over-represents them in the sample, whereas the CAWHS sample has a small representation of the better off and a much larger presence of the very low and low-income farmworkers that we believe to be closer to the true distribution.[11] In order to test this possible bias, we picked as dependent variables a few very sensitive outcome variables. These included visits to the doctor and dentist in the last year, whether the farmworker or his/her children had health insurance, and whether, in particular, they had MediCal or employer-based insurance. We analyzed

[9] The CAWHS sample had 13% missing values for this variable.
[10] The CAWHS sample had 22% and the CHIS sample had 14.5% missing values for this variable.
[11] The National Agricultural Workers Survey has demographic traits quite similar to the CAWHS.

these outcome variables by looking at the difference across the surveys when we compared these dependent variables to independent variables such as language ability, educational level, income, immigration status, and years in the United States for the foreign born. With the children, in addition, we included similar explanatory variables that were linked to their parents' characteristics. It was often revealing to our argument to check the association of a parent trait with an outcome among his/her child.

We did not attempt any statistical rendering for this section such as reporting chi squares. We make our point about the differences in the sample by demonstrating three points by cross-tabular analysis. First, we show how the CHIS sample represents a group that is far better assimilated or connected to U.S. institutions than the CAWHS sample. In the second section, we show that there is further evidence of bias in the data from another type of comparison. Even when the samples vary in similar ways across the cross-tabulated variables, the differentials are greater in the CAWHS. If we assume that the CAWHS is an unbiased sample, then these greater ratios in the CAWHS as compared to the CHIS demonstrate that there is a bias in the CHIS sample against the less fortunate and toward the more fortunate in the total universe of farmworkers. Thirdly, we show that the two surveys are quite consistent across many variables where this consistency would be expected. This third section demonstrates the inherent validity of both surveys for the real universes that they are measuring. The results of these valid surveys must be used appropriately, recognizing the limitations of their sampling techniques and the universes they represent.

CHIS sample is well connected and more assimilated:

Before we begin reviewing the cross-tabular comparisons between the two surveys, it is helpful to remind ourselves how different the two samples are. The CAWHS sample has 9.6 percent who finished high school, the CHIS sample 31.7 percent. The CAWHS sample has only 5 percent with annual income over $30,000, the CHIS sample has 23 percent. In the CAWHS, 6 percent speak English well, in the CHIS, 16 percent speak it well. For MediCal, 6 percent of the CAWHS and 20 percent of the CHIS samples were enrolled. For employer-based insurance, 12 percent of the CAWHS and 36 percent of the CHIS sample were covered. For adult health insurance in general, 25 percent of the CAWHS and 61 percent of the CHIS have some type of health insurance. Among the CAWHS sample, only 17 percent of adults had dental visits in the last year, whereas in the CHIS sample 48 percent had a dental visit in the year before the survey. In the CAWHS, 47 percent are marginalized in the sense that neither parent nor child has health insurance; in the CHIS in only 14 percent of the sample do neither parent nor child in the household have any insurance. As we pointed out above, the CHIS sample is, on the surface, a group much more able to access our institutions. However, even within this overall privileged position, cross-tabular analysis points out a further level of advantage for the CHIS group.

The children of the farmworkers can also be analyzed in a similar fashion to the adults along the same three axes--the greater level of assimilation in the CHIS sample, the further proof of bias due to the greater ratios across similar crosstabulations in the CAWHS than in the CHIS sample, and the consistency and validity of both surveys. The

children in the two surveys are more similar than their parents at least in superficial ways. The same proportion (about 82 percent) was born in the United States in both samples. Thus, a similar percent would be eligible to enroll in public social welfare programs. Despite this similarity, the analysis of the data on children provides additional evidence that the CHIS and the CAWHS samples are quite different.

Connected to the U.S. Systems - Adults:

One example that the CHIS sample is more able to access benefits than the CAWHS sample is clearly demonstrated in Table 1. In both samples, those who speak English and Spanish in the home benefit from higher rates of health insurance; 34 percent who speak English in the home in the CAWHS, and 61 percent who speak it in the home in the CHIS are insured. English-only speakers in the CHIS experience the highest rate of coverage (78 percent); no one in the CAWHS speaks only English.[12] The worst off are the indigenous speakers from Mexico who rarely have insurance (5 percent in the CAWHS). The indigenous group is probably largely missed by the CHIS telephone survey since often their Spanish is not adequate to do a telephone interview. This table shows that the CHIS sample has better access to health services within each language category and also demonstrates that there considerable areas of non-overlap between the surveys.

Table 1: Percent of Respondents with Medical Insurance

Survey	English-only	Spanish	English and Spanish	Spanish and Indigenous
CAWHS	N/A	21% (n=539)	34% (n=336)	5% (n=37)
CHIS	78% (n=80)	55% (n=251)	61% (n=136)	N/a

One very sensitive measure of linkage to U.S. social institutions is the ability to obtain employer-provided health insurance. A real benefit for the English-only group in the CHIS is seen in this measure. They represent 17 percent of the CHIS sample and 48 percent of this group is insured by their employer. In the CAWHS, those who speak English well (but as a second language) are not more likely to have employer-based insurance than those who speak English poorly [13 percent (n=53) versus 12 percent (n=866)]. In the CHIS, those who speak English well have a distinctly better chance of having employer insurance [47 percent (n=60) vs. 31 percent (n=346)]. The CHIS group is able to take advantage of its English speaking ability to obtain a better position relative to the non-English speakers. In the CAWHS, even the group that speaks English is unable to take advantage of this entrée to better health access.

Similar patterns occur when we look at employer-based insurance with respect to other explanatory factors. In the CAWHS, the benefits for this type of insurance only start accruing to those 3 percent of the total CAWHS sample that have been to college. Meanwhile, in the CHIS, all those with more than 10 years of school (38 percent of the

[12] These are probably predominantly U.S. born non-Hispanic supervisors, machine operators, and young family workers. This group represents approximately 20 percent of the total population in the CHIS, but is virtually non-existent in the CAWHS.

sample) benefit from higher percentages of coverage. All these CHIS respondents have 40 percent or more employer-provided coverage. In the CAWHS, even those with some college, only 19 percent have health coverage. The samples are overlapping, but the representation of the poorer group in the CHIS is remarkably low for a farmworker sample. Additionally, even for those with the same education, the CHIS group tends to have more access.

With respect to income, the CHIS group again shows greater access to employer insurance within and across income categories. It is not until $30,000 or greater annual income level that the CAWHS group benefits from this type of insurance. This 5 percent of the CAWHS sample with higher income has rates of 47 percent employer insurance. However, the CHIS group at greater than $15,000 annual income already demonstrates relatively high rates of employer insurance. More than 63 percent of the sample earns more than this amount. At $15,000 to $20,000, 35 percent are employer insured; at $20,000 to $30,000, 45 percent are employer insured, and above $30,000, 55 percent are employer insured in the CHIS sample.

Another example of the difference between the two samples is the differential use of employer-based insurance by the group without permanent residency status. For this sub-sample, in the CAWHS 5 percent have employer insurance and in the CHIS 23 percent have it. This serves to remind us that the CAWHS group contains nearly all people without work authorization (undocumented), while the CHIS group has a large proportion of pending status work-authorized residents.

Another crucial measure of linkage to U.S. service institutions is the differential rates of enrollment in MediCal. Table 2 shows that in the CHIS, the poor English speakers actually get more MediCal (24 percent versus 15 percent) than those who speak it well. This is because in the better off CHIS sample, those who speak English have too high an income to qualify for MediCal. Meanwhile, in the less advantaged CAWHS sample, those who are less proficient in English get less MediCal than those who are more proficient (11 percent versus 5 percent). In this poorly connected, unassimilated group, English is a help in obtaining access to services, and many in both groups have income low enough to qualify. However, both CHIS language groups do better than both CAWHS groups, despite the greater poverty in the CAWHS group.

Table 2: Percent of MediCal Use by Ability to Speak English

Survey	Well	Not well
CAWHS	11% (n=53)	5% (n=866)
CHIS	15% (n=60)	24% (n=346)

The differential access to MediCal across the two samples is further illustrated by comparing different immigration status groups in Table 3. The high number of U.S.-born in the CHIS does not use much MediCal, whereas the small U.S.-born CAWHS group does (18 percent versus 8 percent). Moving across the table, we see that the lower the immigration status the less coverage there is in the CAWHS sample. However, in the

CHIS, there is continued high receipt among the immigrants with green cards (permanent resident status) and those without permanent documents. The CHIS immigrants are poorer than the U.S. born and naturalized citizens in the CHIS sample and as a result have qualifying income status. The non-permanent resident group in the CHIS gets MediCal because they are more assimilated than the CAWHS group (pending immigration status) and poor. In the CAWHS, although the sample is poorer, they are not enrolled in MediCal, who due to lack of papers are ineligible, or are fearful of seeking it for themselves, although as we will see below their children are often covered.

Table 3: Percentage Use of MediCal by Immigration Status Groups

Survey	US born	Naturalized	Green card	Not Permanent Resident
CAWHS	18% (n=61)	13% (n=53)	6% (n=461)	4% (n=312)
CHIS	9% (n=113)	14% (n=66)	29% (n=172)	20% (n=135)

Whether someone had a dental visit in the year before the survey is a concrete measure of health care utilization across the two samples. In the CAWHS survey, the number of years in the U.S. does not matter for a dental visit in the previous year. Across the different lengths of stay in the country, about 16 percent of the CAWHS interviewees went to the dentist. However, in the CHIS sample, there was an increase with years spent north of the border. The increase from the newcomers to those here for many years rises from 36 percent to 49 percent. This shows that the CHIS group assimilates at a faster rate than the CAWHS group, and is able to access U.S. institutions more quickly.

Education also had more of an impact on dental visits in the CHIS group. It is only after high school that the percentage of those who had a dental visit in the previous year increases in the CAWHS sample, while for the CHIS group after 10 years of school the percentage of farmworkers with a dental visit begins increasing.

Speaking English well as compared to not well or not at all makes a big difference with the CHIS for dental visits. The English had the advantage (61 percent versus 44 percent, n=403). However, with the CAWHS sample where not many go to the dentist, the effect is not conclusively in favor of one group (13 percent versus 17 percent, n=906). Those who speak English less well had more visits. This is because some of these low-income people in both groups (English and non-English speakers) have public insurance. In fact, a cross-tabulation shows that the English speakers in the CAWHS are not higher income than others in the sample.

Another good measure to assess linkages to services is to look at enrollment in Food Stamps, a program that the two samples use at nearly equal levels overall. In the CAWHS, the population without documents actually gets less Food Stamps despite greater levels of poverty than the green card group (8 percent versus 10 percent). It is the reverse with those without permanent documents in the CHIS who get more Food Stamps than the green carders (18 percent versus 11 percent). This is probably because they are poorer and are more likely to be eligible (see Table 4).

Table 4: Percentage Receipt of Food Stamps by Immigration Status		
Survey	Green card	No docs
CAWHS	10% (n=458)	8% (n=318)
CHIS	11% (n=166)	18% (n=132)

A similar pattern to what we saw above applies to language ability and the acquisition of Food Stamps. The English speakers in the CHIS get no Food Stamps, probably because their income is too high and they are not eligible. Those who speak well get less than those who do not speak English. The English speakers in the CHIS are demonstrably a different group than those who have English and Spanish in their home in the CAWHS. In the CAWHS, the English and Spanish speaking group gets more Food Stamps than the Spanish-only speakers (11 percent versus 8 percent, n=930). Among the indigenous speakers the rate is practically null. And, in the CAWHS, those who speak English well get more Food Stamps than those who do not (13 percent versus 8 percent). Again, it is an advantage in the poor and isolated CAWHS group to speak English to obtain access. In the CHIS, one observes the obvious result, which is that many of the English speakers earn too much to qualify.

Connected to the U.S. Systems: Children:
CHIS children of farmworkers benefit from their parents having a greater ability to access U.S. institutions when compared to CAWHS children of farmworkers. For example, in the CHIS sample, children with higher household incomes have more health care insurance coverage than lower income children, while in the CAWHS sample the inverse is true. If we divide the sample into two groups of more or less than $15,000 annual income, we see that CHIS children have a greater rate of coverage with higher income (72 percent to 89 percent) while CAWHS children with lower income have a higher rate of health insurance (58 percent versus 47 percent). This is related to the dependence of the CAWHS group on publicly funded insurance. Fewer of the higher income children qualify (see Table 5). There are many CAWHS families that at least temporarily make above the poverty level and become ineligible for MediCal. The CHIS children have greater access to employer-based insurance, which increases with income.

Table 5: Percentage of Insurance coverage by income groups		
Survey	<15,000 annually	>15,000 annually
CAWHS	58% (n=117)	47% (n=173)
CHIS	72% (n=68)	89% (n=132)

Table 6 demonstrates that in the less connected CAWHS group, when farmworker parents speak more English in the home, their children benefit by having more health insurance. In the CHIS, speaking English is the home does not increase access to health insurance. The English and Spanish speaking household is not a particular help since Spanish is good enough to get benefits for the children in the connected CHIS group.

Table 6: Percentage of Insurance coverage by language of home		
Survey	Spanish only	Both English and Spanish
CAWHS	46% (n=178)	53% (n=137)
CHIS	82% (n=117)	83% (n=72)

Table 7 demonstrates that in the CAWHS, the children whose parents do not have permanent documents actually get more health insurance due to their relative poverty (51 percent vs. 44 percent). The undocumented adults in the sample get less MediCal for themselves since they are not citizens (See table 3 in adult section above). Since a large majority of children were born in the U.S. they are eligible for public programs like MediCal. Children of parents without documents in the CAWHS are much poorer than the children of Green Card holders (in the CAWHS, children of the undocumented: 33 percent<$10,000; children of the permanent residents: 15 percent<$10,000). This difference explains why these predominantly citizen children get more public insurance like CHDP and MediCal due to the income requirements for program eligibility, despite the fact that they have undocumented parents.[13] The CHIS children gain access to these types of public programs, despite relatively better earnings, because they are connected to the system. However, the permanent residents get more than those without residency status (88 percent versus 75 percent). In addition to better access to the public programs, the CHIS children also have more private and employer insurance, which also contributes to their high coverage proportions reported here.

Table 7: Percentage of Child Insurance coverage by Immigration Status of Parent			
Survey	Naturalized citizen	Green card	No Permanent Residency
CAWHS	76% (n=17)	44% (n=192)	51% (n=86)
CHIS	86% (n=37)	88% (n=84)	75% (n=65)

In the CHIS, children who have a parent who was born in Mexico do not experience significantly lower rates of health insurance (79 percent versus 84 percent). However, for the CAWHS children, whose parent was born in Mexico, they definitely are at a disadvantage when it comes to accessing health insurance coverage with 47 percent having coverage, while 90 percent of children whose parent was born in the U.S. have health insurance. Again, the population sampled in the CHIS is much more able to access U.S. institutions and public programs (see Table 8) despite place of birth. Despite characteristics usually associated in farmworker population with marginalization, they are able to make the connection to institutions.

[13] Among children of the undocumented in the CAWHS (31/41) of kids with insurance have publically funded insurance.

Table 8: Percentage of Insurance coverage for Children by Place of Birth of Parent		
Survey	US born	Mexico
CAWHS	90% (n=20)	47% (n=303)
CHIS	79% (n=14)	84% (n=181)

For every type of insurance, CHIS children have a higher rate of insurance coverage than CAWHS children. In particular, they have more coverage (almost 3 times more) in MediCal and employer-based insurance. Moreover, when parents have employer-based insurance (CHIS: 33 percent, CAWHS: 13 percent), CAWHS children are much less likely to be covered by their parents' policy. Fully 92 percent of the CHIS children whose parents have insurance are covered by their parents' policy while only 84 percent of the CAWHS get coverage.

As with adults, receipt of Food stamps is another good measure of a strong linkage to social services for children of farmworkers (see Table 9). In both samples, those whose parents have no permanent documents are not barred from obtaining food stamps since most of the children are born in the United States. The role played by legal status is complex across the two groups. In the CAWHS, the rate is the same as for green card holders (17 percent) and for the CHIS it is actually higher (25 percent versus 14 percent). This is true because the level of poverty of those without documents in the CHIS population allows them to qualify for food stamps. Some of those with papers exceed the income eligibility level. Among the CAWHS children, the undocumented status and the isolation of the parents keeps them out of the system, despite their greater poverty and the fact that their children as U.S.-born citizens qualify for this public assistance program.

Table 9: Percentage of Food Stamp Receipt by Immigration Status of Parent		
Survey	Green card	No permenant residency
CAWHS	17% (n=206)	17% (n=95)
CHIS	14% (n=84)	25% (n=64)

The WIC program is very popular for children aged 0 to 5. As we see in Table 10, for the CAWHS children, U.S. birth is quite important. Although practically all the children qualify with respect to income for WIC, the CAWHS parents do not have WIC for their foreign born children at the rates that they do for their US born (58 percent versus 38 percent). However, the CHIS parents, who appear to be more assimilated, are able to obtain WIC benefits at the same high rates for children regardless of place of birth (61 percent versus 63 percent).

Table 10: Percentage of WIC Receipt by Place of Birth of Child		
Survey	Us born	For born
CAWHS	58% (n=151)	38% (n=16)
CHIS	61% (n=89)	63% (n=8)

A similar argument based on the languages spoken at home holds for WIC benefits. For the CAWHS parents who speak only Spanish, they obtain Food Stamps for their children at the same rate as those in households where English is also spoken. This is despite the fact that the Spanish-only households are poorer and more likely to qualify. However in the CHIS Spanish-only households, these "better connected" parents get WIC more frequently for their children, consistent with the poorer income levels of those households (see Table 11). One can see exactly the same argument used with respect to dental visits in Table 12. Again, CHIS parents are better able to navigate U.S. institutions and get their children enrolled in services despite language barriers.

Table 11: Percentage of WIC Receipt by Languages Spoken at Home

Survey	Spanish only	English and Spanish
CAWHS	54% (n=197)	55% (n=149)
CHIS	73% (n=59)	50% (n=32)

Table 12: Percentage of Dental Visits in Year Before Survey by Language Spoken at Home

Survey	Spanish only	English and Spanish
CAWHS	31% (n=143)	31% (n=128)
CHIS	58% (n=98)	75% (n=65)

In Table 13, we see that the CHIS sample is better connected at lower income levels than the CAWHS sample. This group is better able to provide health insurance for its children. For example, at $15,000-$20,000 a year income level, 24 percent of farmworker children have employer insurance.

Table 13: Percentage of Employer Insurance by Income of Family

Survey	$15-20,000	$20-30,000	$30,000+
CAWHS	4% (n=74)	12% (n=74)	44% (n=11)
CHIS	24% (n=46)	31% (n=52)	56% (n=34)

Further Evidence of Bias: The greater differentials in the CAWHS than the CHIS Crosstabular Analysis

Methodological Note:

We can also demonstrate the bias of the CHIS by looking at the ratio of the variation of the samples across the same two variables. Since the CAWHS mirrors closely the NAWS sample in demographic characteristics, we can posit that the CAWHS represents the whole of the farmworker universe. Then, the fact that the CAWHS consistently demonstrates a greater ratio than the CHIS, when comparing the different proportions of subsamples in the surveys across the same variables, further demonstrates that the CHIS

is under-representing parts of the universe. For example, if we look at Table 14 below, we see that for both green card holders and those without permanent residency the CHIS sample has more insurance. So, in the first instance there is a strong implication of bias. But, in addition, the ratio of the two proportions (the ratio of the ratio) is greater for the CAWHS. This implies that the CHIS is oversampling in the lower right-hand cell. Namely, the CHIS-sampled farmworkers without permenant residency, who have insurance, are more likely to be included in the sample than their true proportion in the CHIS. This occurs because those without permanent residency in the CHIS are disproportionately those with pending status (rather than undocumented) that are unusually (for farmworkers) connected to the system. This same pattern is demonstrated throughout this section. The cell representing the least advantaged in the CHIS sample really represent a group better connected than the true universe of farmworkers. As a result, the ratio of the "good" outcome, be it more insurance, more dental visits, etc. is relatively low relative to the "bad" outcome in the CHIS compared to the CAWHS. In the CAWHS, the least advantaged group represents the full range of farmworkers most of whom have very weak ties to U.S. institutions. As a result the ratio of the good to the bad outcome is relatively high in the CAWHS as compared to the CHIS.

Table 14: Percentage of Insured by Immigration Status

Survey	Green card	No permanent residency
CAWHS	31% (n=451)	14% (n=312)
CHIS	61% (n=172)	42% (n=135)

Adult Evidence of Bias:

For example, in Table 14 we see that the ratio of percent of CAWHS respondents who have health insurance and green cards to those with health insurance but are not permanent residents is 2.21 (31/14), while for CHIS the ratio is 1.45 (61/42). The advantage among the CAWHS sample of having a green card relative to not having one is greater than the advantage in the CHIS sample (see Table 15). If the CAWHS data is unbiased, then this relationship reinforces the evidence that the CHIS data is biased.

In Table 15, we see that there is an advantage for both samples of having insurance with respect to getting to the dentist in the year before the survey. However, the advantage for the CAWHS group 1.93(27/14) is relatively more than for CHIS 1.56 (56/36). Insurance is apparently more important for the poorer CAWHS population with respect to paying for the dentist.

Table 15: Percentage dental visits for respondents with insurance

Survey	Have insurance	No insurance
CAWHS	27% (n=226)	14% (n=693)
CHIS	56% (n=294)	36% (n=189)

Child Evidence of Bias:
The percent of children born in the United States is the same across the two samples but the CHIS children have much higher rates of health insurance than the CAWHS children. In both samples the US born children have an advantage but the ratio is higher for the CAWHS children 54/32=1.69 than for the CHIS children 88/61=1.44. This points to a bias in the CHIS data (see Table 16). Namely, the foreign born CHIS group that get insurance are over-represented in the CHIS sample relative to the universe of farmworkers.

Table 16: Percentage of Insurance by Place of Birth of Child

Survey	Foreign born	Us born
CAWHS	32% (n=62)	54% (n=270)
CHIS	61% (n=36)	88% (n=164)

For both sets of children, greater English language ability of their parents results in a higher rate of insurance coverage (see Table 17). Again the CAWHS has a greater ratio of percentages: 1.40 (67/48) vs. 1.17 (95/81). The non-English speaking CHIS group with insurance is over-represented.

Table 17: Percentage of Insurance by English Language Ability of Parent

Survey	Well/very well	Not well
CAWHS	67% (n=15)	48% (n=307)
CHIS	95% (n=22)	81% (n=171)

It is also true in both samples that the longer the foreign-born parent has been in the United States, the greater the chance that the child has insurance. But, again the ratio of difference is greater for the CAWHS than the CHIS (48/34=1.41 vs. 84/77=1.09) demonstrating an over-representation of CHIS newcomers who have insurance (see Table 18).

Table 18: Percentage of Insurance by Years in U.S. of Parent

Survey	0-4 years	5+
CAWHS	34% (n=35)	48% (n=274)
CHIS	77% (n=14)	84% (n=172)

When the parents have insurance, it is much more likely that the children are also insured, as can be seen in Table 19. Again, however, the ratio of difference is greater for the CAWHS than for the CHIS (87/34=2.56 vs. 95/60=1.59).

Table 19: Percentage of Insurance Coverage of Children by Possession of Insurance by Parent		
Survey	Parents have Insurance	Parents don't have
CAWHS	87% (n=97)	34% (n=233)
CHIS	95% (n=132)	60% (n=68)

This same discussion could be extended to the comparison of many more pairs of variables. For example, insured children get more Food Stamps, U.S. born children get more employer-based insurance, children whose parents do not have documents get more MediCal and children whose parents are insured are more likely to have visited a doctor in the last year. In all these cases, the relationship holds for the two surveys, but the ratio of difference is greater for the CAWHS than for the CHIS sample. Assuming that the CAWHS is an unbiased sample, then this repeated pattern strengthens the argument that the CHIS sample is biased.

Data across surveys consistent showing high quality of both surveys

Analysis of the CHIS and the CAWHS child data sets also demonstrate that both contain valid information on the populations sampled, demonstrating that they are valid surveys if one is careful to apply them properly. Data from the two surveys is often consistent in expected ways. Although we argue that the population of the CHIS survey represents largely a better-connected subset of a larger universe of farmworkers, variables for the two samples of farmworkers often vary in similar patterns. They are both largely Hispanic, immigrant, poor and in need of services. The fact that these two similar universes have many points in common tends to reinforce the argument that both surveys contain valid data for the populations that they capture.

Adults:
For example, the rate of insurance coverage goes up with the amount of time in the United States for both samples. It is approximately three times as high for those who have been in the U.S. a long time than for newcomers. CAWHS increases from 10 percent to 31 percent (n=874), and CHIS from 21 to 65 percent (n=373) for those born abroad. This impact is not relevant for the foreign-born children's stay in the country, as only 18 percent in each sample was born in Mexico. However, children are indirectly impacted since the longer the parent has been in the U.S., the more likely it is that the child has insurance.

Income also varies similarly in the two surveys. Respondents obtain more insurance with household income over $30,000 family income. At this income level, half of the CAWHS sample and four-fifths of the CHIS group have health insurance. However, again, few in the CAWHS can benefit from this, as only 5 percent have over $30,000 annual income while 23 percent of the CHIS people do. Another example is in English language ability. Those who speak English well are more likely to get insurance than those who do not. In the CAWHS, the advantage is 30 percent to 24 percent (n=919); in

the CHIS the advantage is 77 percent to 54 percent (n=406). However, this must be tempered by the fact that the CAWHS has only 6 percent and CHIS 15 percent that speak English well. Males get more health insurance through employers than females in both samples. Married people have more employer insurance in both surveys, despite the fact that the separated and divorced have more public (and overall) insurance in both the CHIS and the CAWHS.

The CHIS and the CAWHS vary similarly in ways that are expected. In both surveys, employer insurance goes up with education but MediCal enrollment goes down with education and with income. In both surveys, going back to Mexico for a doctor's visit increases with years in the country for the foreign born and decreases with weaker immigration status (i.e. from citizen, naturalized, green card, to no permanent residency). This latter occurs because the undocumented or weakly documented do not want to pay for crossing the border or risk their immigration status. It is interesting that going abroad for medical care is equally high in both groups despite the fact that the CHIS is more assimilated and has greater access to U.S. medical institutions and insurance. It is without doubt that the lower cost of medical care in Mexico is an incentive. It is also interesting that in the CAWHS these types of trips were very high among the indigenous group; 30 percent (n=37) went abroad. This population is particularly untrusting of U.S. medicine. In both CHIS and CAWHS, those who speak English well are much less inclined to go abroad for medical care. Finally, having insurance does not seem to prevent people from seeking medical care abroad; in the CAWHS actually more insured go than uninsured (16 percent versus 12 percent).

There are various other commonalities between the surveys. In both surveys, immigration status has the expected effect on visits to the dentist; the weaker the immigration status, the lower percent has gone in the last year. Dental visits go up with education in both surveys. Females report more high blood pressure in both surveys. Both surveys show an inverse relationship of housing subsidy with income. In both surveys, the percentage of food stamp recipients drops as income increases but not as education increases. Women get more food stamps than men in both surveys. The insured get more food stamps than the uninsured in both surveys.

Children:

The same consistency can be seen in comparing data on children. One example is that for both surveys the educational level of the parents does not affect insurance for the children. This is an expected finding for farmworkers. A second finding is that insurance coverage is not associated with receipt of WIC for either sample. Though the levels are different the independence of the receipt of WIC is constant (see Table 20).

Table 20: Percentage of Receipt of WIC by insurance

Survey	yes	no
CAWHS	51% (n=129)	49% (n=204)
CHIS	92% (n=59)	89% (n=38)

In both surveys, it is not surprising that insurance is associated with more recent doctors' visits.

Table 21: Percentage of doctors' visits year before the survey by insurance		
Survey	Yes	no
CHIS	85% (n=162)	68% (n=34)
CAWHS	77% (n=59)	61% (n=146)

One very interesting consistency across the surveys relates to the association of a doctor's visit in the past year with different kinds of insurance plans. Interestingly, as seen in Table 22, MediCal seems to be associated with the most likelihood of a doctor's visit. Even many of the uninsured find a way to get their children to the doctor, even though they may need to pay out of pocket. Employer plans are less effective than MediCal in getting farmworker children to the doctor.

Table 22: Percentage of a doctor's visit in the past year by type of insurance				
Survey	Uninsured	MediCal	Employer-based insurance	Private
CHIS	78% (n=68)	88% (n=60)	79% (n=62)	100% (n=4)
CAWHS	65% (n=216)	90% (n=30)	77% (n=43)	69% (n=16)

The opposite association is found with the case of dental visits. It is not MediCal but Employer-based insurance that appears to be most closely associated with dental visits. Again, the data are consistent across the two surveys.

Table 23: Percentage of Dental Visits by Type of Insurance				
Survey	Uninsured	MediCal	Employer-based Insurance	Private
CHIS	60% (n=60)	62% (n=50)	73% (n=54)	75% (n=4)
CAWHS	29% (n=199)	33% (n=24)	46% (n=41)	7% (n=13)

These same kinds of consistent findings are seen across many other pairs of variables across the two data sets for the children. Some are surprising. For example, in both data sets, more children of the undocumented farmworkers go to doctors than children of green card holders. This is true because those without permanent documents due to their poverty often get more public insurance which is associated with doctor's visits. Not surprisingly, possession of insurance (by children and their parents) and speaking English well among the parents is associated with children's dental visits in the year before the survey in both samples.

So, although the CHIS group is much more connected and gets more benefits than the CAWHS sample, the consistency of the surveys is reassuring that we are comparing two valid sources to prove our point.

Conclusion and Recommendations

Our analyses have demonstrated that while the statewide health telephone survey (CHIS) succeeds in interviewing a significant number of farmworkers, the sample that they reach is not fully representative of the entire population. The population that is partially excluded is lower income, has lower rates of health insurance coverage, and medical and dental service utilization. The excluded population faces higher barriers in numerous areas such as language, culture, and immigration status, that make it difficult for them to access U.S. safety net institutions for themselves or for their U.S. born children. Thus, we have developed the following recommendations:

- CHIS data[14], while they may be valid for the population it represents, should not be used to develop programs and policies for migrant farmworkers in California, as it is not representative of this extremely marginal and hard-to-reach population.

- One should exercise caution in using the CHIS data to conduct research and develop policy and programs for other marginalized populations (e.g. homeless) and other occupational categories that are dominated by poorly assimilated immigrant populations. These include restaurant workers, construction clean-up crews, gardening crews, and sheetrock workers. Information about these populations may be biased in the same way that the CHIS is biased for farmworkers.

- Programs specific to farmworkers are needed because the population is so different even from farmworkers sampled in a randomized fashion by telephone.

- More work should be done to develop face-to-face customized surveys to collect health care access and utilization information from marginalized populations.

[14] The same conclusion would probably be reached with any other non farmworker-customized survey.

Appendix I.

Detailed Methods Section:

To conduct a comparative analysis of the California Health Interview Survey (CHIS) and the CIRS in-house survey, the California Agricultural Workers Health Survey (CAWHS), five principal tasks were undertaken to prepare both datasets for analysis. These principal activities include: (1) the identification of the CHIS reference group, (2) the selection of comparable CHIS and CAWHS variables for analysis, (3) a request for a confidential research data file from the CHIS Data Access Center, and writing the SAS code to prepare the CHIS confidential data, (4) the recoding of CAWHS variables for correspondence across CHIS measures, and (5) the recoding of CHIS variables for correspondence across CAWHS measures.

CHIS Reference Group
The selection of the CHIS reference group for comparative analysis is based on achieving the highest level of compatibility with the population of farmworkers sampled in the CAWHS. As a result, the identification process for the CHIS reference group involved a review of potential selection criteria, including: employment in the agricultural industry and occupation, self-reported Latino ethnicity, federal poverty status, and rural classifications. However, since the study strove to compare farmworkers of whatever economic status and ethnic group across the two surveys, it was decided to focus on industry and occupation codes in the CHIS to pick out a sample of farmworkers.

The CHIS IND_MAIN industry code for agriculture includes various 3-digit standard industry codes corresponding to U.S. Census classification (IINDCD 10 through 30), including categories not compatible with the CAWHS population of farmworkers: (010) Agriculture Production, Crops; (011) Agriculture Production, Livestock; (012) Veterinary Services, (020) Landscape & Horticulture Services, (030) Agricultural Services, N.E.C. Therefore, using the IINDCD codes for selection of the CHIS reference group requires that both veterinary services and landscape and horticulture services be excluded. To further define the reference group, a cross tab of industry and occupation was obtained from the CHIS Data Access Center. The CHIS proportional case distributions of occupation by industry demonstrate that selection of the reference group based on occupation (IOCCCD) codes provide a more precise approximation of fieldworkers in the CHIS population. The final selection criteria for the CHIS reference group uses the following IOCCCD codes: (477) Supervisors, Farm Workers; (479) Farm Workers; (484) Nursery Workers; (485) Supervisors, Related Agricultural Worker; (488) Graders & Sorters, Agricultural Products, and the following IINDCD industry codes: (010) Agriculture Production, Crops; (011) Agriculture Production, Livestock; (030) Agricultural Services, N.E.C. Therefore, among the selected IOCCCD occupation codes, specific cases classified under the following IINDCD industry codes were not selected: Landscape & Horticulture services; Groceries & Related Products, Miscellaneous Wholesale, Nondurable Goods, Retail Nurseries & Garden Stores, Hotels

& Motels, Misc. Entertainment & Recreation Services, and General Government, N.E.C.[15] The sample size for the CHIS reference group is 486.

Federal Poverty Status

Poverty levels in CHIS are measured according to purported exact measures of income; however, the income levels in the CAWHS are based on ranges of income, so that the cutoff for poverty are assumed to be at the bottom of the income ranges for those at or below 200% FPL. In other words, the study would have had to use a conservative estimate for the CAWHS population living at or below 200% of FPL, as it is not possible to program precise poverty levels using CAWHS income ranges. The poverty levels for the CAWHS sample therefore underestimates farmworkers living below 200% FPL. For this reason, comparisons were limited to income levels and poverty comparisons were excluded.

Confidential Data Request from CHIS Data Access Center

Assessing health insurance coverage, use of services, and the health status of children, and its relationship to parents' health insurance status and other characteristics requires a confidential CHIS research data file. A request for the confidential data file was submitted to the CHIS Data Access Center (DAC). This request involves a merged child and adult data set with selected variables, using a subset of the CHIS population according to the reference group selection criteria described above. Due to the confidential and sensitive nature of the data, DAC would not provide CIRS with the actual data. Rather, the CHIS Data Access Center created two confidential data files based on industry codes that CIRS selected, one containing all adult farmworkers, and one containing the children of these farmworkers that also includes some information (through household-linked variables) about the parents of these children. CIRS submitted SAS programs to run frequencies and cross-tabulations on selected variables, and DAC ran the programs and provided the resulting tables. We then calculated chi-square statistics to determine whether differences in frequencies between CHIS and CAWHS were statistically significant and important.

Data Recoding in CAWHS and CHIS

Both the CHIS and CAWHS are population-based random surveys that include low-income Latino/Mexican populations, providing baseline measures on health insurance coverage, health status, and utilization data, including household-level data. Variable lists for the CHIS 2001 adult and child surveys were reviewed, and compatible variables across both the CHIS and CAWHS were identified and selected for analysis. Once variables were selected, data preparation involved the recoding of CAWHS variables for compatibility across CHIS measures, along with the recoding of CHIS variables for consistency across CAWHS measures (however, the latter procedure involved few variables). In other words, the values for the variables were made consistent across the surveys. A data merge was necessary in both the CAWHS and CHIS surveys in order to

[15] The total number of cases coded to IOCCCD codes 477, 479, 484, 485, 488 that were not selected for the CHIS sample is 86 (refer to cross tab of detailed occupation and industry codes, F:\4Farmworker Health\CPAC CHIS-CAWHS\CHIS DATA, Vars, Formats, Labels, Dictionary, Advs\Industry and Occupation-Codes and Output\LeeQuery080504P2_CROSSTAB INDUSTRY & OCC).

link adult-level data to children in the sample. In both surveys a randomly selected child was used to represent "the children" in the household.[16] In the (separate CAWHS, CHIS) merged adult-child datasets, adult-level variables were renamed (transformed into new variables) in cases where adult variable names were equivalent to child variable names.

[16] In the CHIS data on only one child was recorded. In the CAWHS, we randomly selected one child per family. (**proc sort** data=child; by id; **run**; **proc surveyselect** data=child out=sample n=**1**; by id; **run**;)

Appendix II.

Tables

Demographic Variables:

Table 1: Median Age			
	CHIS	CAWHS	t-test
	40 (n=486)	35 (n=966)	p<.0001

Table 2: Marital Status			
Adult Data File	CHIS (n=484)	CAWHS (n=963)	p≤.001
Never Married	16%	28%	
Married/living w/partner	75%	65%	
Child Data File	CHIS (n=393)	CAWHS (n=366)	p≤.001
Never Married	2.5%	10%	
Married/living w/partner	92%	87%	

Table 3: Educational Attainment			
Adult Data File	CHIS (n=486)	CAWHS (n=959)	p≤.001
3rd grade level or less	18%	30%	
4th – 6th grade level	29%	35%	
7th – 12th grade (no H.S. diploma)	22%	25%	
H.S. diploma	17%	7%	
Some College/vocational school	14%	3%	
Parents	CHIS	CAWHS	p≤.025
3rd grade level or less	23%	24%	
4th – 6th grade level	31.5%	38%	
7th – 12th grade (no H.S. diploma)	27.5%	26%	
H.S. diploma	11%	8%	
Some College/vocational school	7%	4%	

Table 4: Country of Birth			
Adults	CHIS (n=485)	CAWHS (n=963)	p≤=.001
US	23	6	
Mexico	74	90	
Children	CHIS (n=200)	CAWHS (n=362)	**
US	82	82	
Mexico	17	18	

Table 5: Citizenship			
Adult Data File	CHIS (n=486)	CAWHS (n=891)	p≤.001
US	37%	13%	
Non-Citizens with Green Cards	35%	36%	
"Not fully" documented (no Green Cards)	28%	36%	
Child Data File	CHIS (n=200)	CAWHS (n=347)	p≤.001
US	25.5%	13%	
Non-Citizens with Green Cards	42%	59%	
"Not fully" documented (no Green Cards)	32.5%	27%	

Table 6: Length of Time in US			
	CHIS (n=373)	CAWHS (n=890)	p≤.025
Less than 1 year	4%	8%	
2-4 years	9%	10%	
5-9 years	17%	20%	
10-14 years	21%	22%	
15 or more years	49%	40%	

Table 7: English Language Proficiency			
Adult data file	CHIS (n=406)	CAWHS (n=934)	p≤.001
Very well	6%	0%	
Well	9%	6%	
Not Well/At All	85%	94%	
Child data file	CHIS (n=193)	CAWHS (n=353)	p≤.001
Very well	3%	0%	
Well	8%	5%	
Not Well/At All	89%	95%	

Table 8: Language(s) Spoken at Home			
Adult data file	CHIS (n=496)	CAWHS (n=931)	p≤.001
English	16%	0%	
Spanish	51%	59%	
English & Spanish	27%	37%	
Child data file	CHIS (n=200)	CAWHS (n=353)	p≤.001
English	3.5%	0%	
Spanish	58.5%	56%	
English & Spanish	36%	42%	

Table 9: Household Income			
Adult data file	CHIS (n=486)	CAWHS (n=784)	p≤.001
Less than $5,000	4%	11%	
$5,001-$10,000	12%	25%	
$10,001-$15,000	20.5%	21%	
$15,001-$20,000	20%	17%	
$20,001-$30,000	20.5%	17%	
More than $30,001	23%	5%	
Child data file	CHIS (n=200)	CAWHS (n=367)	
Less than $5,000	2%	3%	
$5,001-$10,000	12.5%	13%	
$10,001-$15,000	19.5%	18%	
$15,001-$20,000	23%	23%	
$20,001-$30,000	26%	23%	
More than $30,001	17%	7%	

Table 10: Work Status Last Week			
	CHIS	CAWHS	
Employed Adults	90% (n=486)	86%'(n=930)	p≤.001
Employed Parents	91% (n=200)	83% (n=354)	p≤.01

Outcome Variables:

Table 11: Type of Health Insurance			
Adult Data File	CHIS (n=467)	CAWHS (n=936)	p≤.001
Uninsured	41%	76%	
Insured	59%	24%	
Medi-Cal/CHIP	20%	6%	
Employment-based	33%	12%	
Privately purchased	6%	4%	
Children	CHIS (n=200)	CAWHS (n=333)	p≤.001
Uninsured	17%	50%	
Insured	83%	50%	
Medi-Cal/CHIP	46%	24%	p≤.001
Employment-based	24.5%	9%	p≤.001
Privately purchased	1.5%	5% (n=367)	p≤.025
Healthy Families	11.5%	6%	p≤.05
Parents	n=199	n=360	p≤.001
Uninsured	34%	71%	
Insured	66%	29%	
Medi-Cal/CHIP	31%	9%	
Employment-based	33%	13%	
Privately purchased	2%	5%	

Table 12: Public Program Participation Rates			
Adult Data File	CHIS	CAWHS	
TANF/CalWorks	5% (n=424)	4% (n=965)	**
Public Housing Subsidies	5% (n=424)	4% (n=965)	**
SSI/SSD	3% (n=425)	4% (n=965)	p≤.10
Food Stamps	12% (n=425)	8.5% (n=965)	p≤.05
Child Data File	CHIS	CAWHS	
TANF/CalWorks	5% (n=198)	8% (n=367)	**
Food Stamps	18% (n=199)	15% (n=367)	**
WIC	61% (n=97)	37% (n=367)	p≤.001

Utilization Rates:

Table 13: Doctor Visits			
Adults	CHIS (n=482)	CAWHS (n=931)	p≤.001
Never	2%	25%	
More than 5 years ago	9%	6%	
Between 1 and 5 years ago	26%	26%	
1 year ago or less	63%	43%	
Children	CHIS (n=188)	CAWHS (n=319)	p≤.001
Never	1%	11%	
More than 2 years ago	3%	6%	
Between 1 and 2 years ago	10%	13%	
1 year ago or less	86%	70%	
Parents	CHIS (n=198)	CAWHS (n=354)	p≤.001
Never	2%	19%	
More than 5 years ago	8%	7%	
Between 1 and 5 years ago	29%	26%	
1 year ago or less	61%	47%	

Table 14: Dental Visits			
Adults	CHIS (n=483)	CAWHS (n=937)	p≤.001
Never	9%	50%	
More than 5 years ago	14%	8%	
Between 1 and 5 years ago	28%	25%	
Within the last 12 months	48%	17%	
Children	CHIS (n=171)	CAWHS (n=286)	p≤.001
Never	20%	47%	
More than 5 years ago	1%	2%	
Between 1 and 5 years ago	13%	20%	
Within the last 12 months	65%	31%	
Parents	CHIS (n=199)	CAWHS (n=354)	P≤.001
Never	14%	46%	
More than 5 years ago	10%	8%	
Between 1 and 5 years ago	29%	25%	
Within the last 12 months	48%	21%	

Table 15: Went to other country for medical or dental care last 12 months			
	CHIS	CAWHS	
Adults	12% (n=486)	13% (n=965)	**
Children	3% (n=200)	3% (n=337)	**
Parent	13% (n=200)	10% (n=367)	**

Health Status:

Table 16: Health Status			
Adults	CHIS	CAWHS	
Arthritis	11% (n=486)	7% (n=961)	p≤.025
Asthma	6% (n=486)	2% (n=958)	p≤.001
Diabetes	5% (n=486)	3% (n=953)	p≤.05
High Blood Pressure	14% (n=486)	8% (n=940)	p≤.001
Children: Asthma	8% (n=191)	3% (n=167)	