

Estimating the Number of Migrant and Seasonal Children in Seven California Counties

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Estimating the number of MSHS Eligible Children In Seven California Counties¹

The goal of this project was to provide Central California Migrant Head Start Program with estimates of the numbers of migrant and seasonal children from birth through age five in the seven county area encompassing Santa Cruz, Santa Clara, Contra Costa, San Joaquin, Stanislaus, Merced and Madera counties. Current estimates of this population did not appear to be in line with delegate agency experience. This project used a four-step process to generate improved estimates for immediate use as well as an estimation method that can be easily updated.

The four steps were:

- A. Review existing estimates and the constructs and data sources used to develop them;
- B. Identify and assess the available data to be used in constructing estimates;
- C. Construct estimates and test their sensitivities;
- D. Compare new estimates and compare with other estimates.

A. Review existing estimates and the constructs and data sources used to develop them

Since there was no readily available national source of data on the number of farmworkers and each federal service program had its own definition of eligible farmworkers, there were several possible methods of developing estimates. For example, during the time period under consideration, 1999-2004, the following programs used these methods:

- Migrant Education used information gathered by recruiters.
- DOL used a complex formula for its farmworker Workforce Investment Act programs that identified the proportions of eligible farmworkers and dependents in each state.
- Migrant health developed county level estimates using a demand-for-labor model in the early 1990s and had updated it for only about one-third of the states.²
- Migrant and Seasonal Head Start estimates developed by Aguirre International and recently updated by Xtria showed the proportion of slots for migrant and seasonal children needed in each state but did not provide county level breakdowns.³

¹ This report was written by Susan Gabbard, Patricia Hernandez and Don Villarejo.

² Larson, Alice C., California Enumeration Study Larson Assistance Services, Vashon Island, Washington: 2000. Available at <http://www.bphc.hrsa.gov/migrant/enumeration/final-ca.pdf>

³ Migrant and Seasonal estimates come from two sources: Klayman, Douglas and Richard Wertheimer, Descriptive Study of Seasonal Farmworker Families, Xtria, Washington, DC, 2001. Soon to be available at http://www.acf.dhhs.gov/programs/core/pubs_reports/hs/hs.html. Xtria estimates were derived from previous estimation efforts by Aguirre International. Aguirre estimates found in the Study of the Characteristics of Families Served by Head Start Migrant Programs by Jorge Nakamoto, Edward Kissam and Anne Stierman, Administration of Children and Families, U.S. Department of Health and Human Services, 1999.

Table 1. Existing Estimates of the Farmworker Population

Program	<u>Migrant Health</u>	<u>Migrant Education</u>	<u>Migrant Job Training</u>	<u>Migrant and Seasonal Head Start</u>
Type of Estimate	Demand for Labor	Based on recruitment	Complex formula based on Census of Agriculture and Population	Complex formula based on Census of Agriculture
Estimates	County level numbers	State level numbers	State level distribution	State level distribution
Strengths	Provides county level information	Provides local counts	Top down formula based method using a variety of data sources. Uses USDA data instead of Census of Population	Top down formula based method using a variety of data sources
Estimates	Bottom up approach uses information that is inconsistent across counties	Depends on the efforts of recruiters in each state	Must rely on Census of Population for Livestock Workers	Not a distribution of workers but of "slots." Look back period not addressed

None of these estimates or other existing estimates met the needs of CCMHS. They were based on different migrant program eligibility criteria and/or used methods that did not meet the needs of CCMHS. The Larson estimate was the closest to the CCMHS requirements as the Migrant Health definition was close to the Migrant and Seasonal Head Start definition but did differ in important ways. The Larson estimates were what Martin called “ground up” estimates and include a lot of subjective judgments by knowledgeable locals.⁴ So the quality of estimates varies county-by-county depending on the quality and effort of the knowledgeable individuals contacted.

The next closest source would have been school district data on Migrant Education children since Migrant Education can serve children age 0-21. However, in practice Migrant Education did not keep comprehensive statistics on preschoolers and the Migrant Education and MSHS differed in key eligibility criteria such as the inclusion of livestock and migrant education’s more extensive look back period.

In identifying methods for CCMHS Aguirre International will apply the following principles:

- Method must be top-down, - not subjective but based on the best available data that was consistent for each county.

⁴ Martin, Philip, *The Endless Quest: Helping America's Farm Workers*. Contributors: David Westview Press. Boulder, CO. 1994.

- Easily replicable – using as much publicly available data as possible.
- Where possible account for shortcomings of previous estimates.
- Adjust for any known biases in the data

A. Identify and Assess the Available Data to be Used in Constructing Estimates

Since there was no one source of data on eligible farmworkers, the process of estimating the number of migrant and seasonal children in a California county relied on formulas that combined data from multiple sources. Several types of data were needed to measure the number of individuals with specific characteristics. We needed data on both the specific characteristics of interest – in this case, preschool children of farmworkers – and data on the size of the population – the number of farmworkers in each county.

There were several sources of data that could be useful in estimating the size of the farmworker population. California had more administrative data on farmworkers than most states because it was one of a handful of states that provides universal coverage of farmworkers under unemployment insurance and workers compensation programs. Unfortunately, none of these data series had exactly the information needed to identify migrant and seasonal children from birth to age 5. Rather, each data source had a piece of the puzzle and each data source had its strengths and weaknesses.

1. Administrative data sets

There were four administrative data sets that contained information useful to estimating the size of the California farm labor force.

- a) California Unemployment Insurance data,
- b) California Workers Compensation Insurance Rating Bureau data,
- c) County Agricultural Commissioners data,
- d) Census of Agriculture data.

a) California Unemployment Insurance Data

California Unemployment Insurance (UI) data was collected quarterly from all employers in the state. The information included the total quarterly payroll and the number of workers on the payroll during the pay period that included the 12th day of each month of the quarter. This information provided a relatively reliable and stable ongoing source of data.

The UI data provided an actual count of the number of workers working during the pay period that included the 12th day of each month but did not provide information on the

number of unique individuals working during the year. Also, persons who were employed during the month, but not during the pay period that included the 12th day of the month, were not reported in the monthly employment figures, though their earnings were included in the quarterly total. Average annual employment was reported, however, this number corresponded to the estimated number of full-time equivalent workers and not the number of unique individuals employed in agriculture. This was more of a problem for agriculture than for some other industries because of the seasonal nature of agriculture. No demographic information was provided so it did not by itself address program eligibility.

The data was readily available on the Internet though not always in the form needed. Monthly breakdowns by county for subgroups within agriculture (e.g., crops versus livestock) were not available for counties from the California Employment Development Department Labor Market Information Division (LMID). These data were available from the Bureau of Labor Statistics (BLS) at <http://www.bls.gov/cew/home.htm#data>. California EDD/LMID did provide in its Agricultural Bulletin breakdowns by multi county regions.

In addition, U.S. BLS provides the annual average of reported monthly employment, and the total annual payroll for Standard Industrial Classification (SIC) code breakdowns for each county. This data was available on the Internet at <http://www.bls.gov/cew/home.htm#data>. Some counties were so small that data was suppressed

The payroll data was of value because it included all payments for everyone, even if they did not appear in the monthly total because they were not on payroll during the pay period that includes the 12th day of the month.

There were several concerns with the data.

- Underreporting by agricultural employers.
- Some employers, such as wineries who employ farm workers, were not in the agricultural Standard Industrial Classification (SIC) or North American Industry Classification System (NAICS) codes and a small number of farmworkers were reported as industrial workers.
- Under reporting of work for those who were reported.
- Non-production workers being included in totals.
- Farm labor contractors who operated in adjacent counties but report only in the county where their administrative headquarters is located.

The only study done of under-reporting of both work and workers by agricultural employers was done by Aguirre International.⁵ In the early 1990s Aguirre International compared the NAWS data to Unemployment Insurance data and derived estimates of the differences in the two data collection methods. For this comparison study, all social security numbers (SSN) of NAWS sample members were submitted to LMID. LMID

⁵ Unpublished manuscript, Aguirre International 1991.

then matched these SSNs to LMID reported data and provided Aguirre with the corresponding UI records.

The results were that 83% of workers who reported to the NAWS that they had worked in California were found in the LMID data. The workers who were not found in LMID reported data were more likely to be younger, U.S. born and had fewer weeks of work. For those workers where records matched, 93% of work reported to the NAWS was reported to LMID. That is, slightly more work was reported to the NAWS than to LMID.

To check for underreporting of contract labor, Aguirre staff compared the proportion of total California farm labor contracting in the seven counties. The seven-county proportion of California contractor payroll was consistent across both farmers' reports of contract expenses (USDA Census of Agriculture) and contractor's report of wages (BLS payroll).

a) Census of Agriculture

Every five years, the US Department of Agriculture conducts a Census of Agriculture (COA) where all U.S. farms answer an extensive census form that includes information on the number of workers directly hired at the enterprise and the dollar value of expenses for both direct hire and contract work. The 1997 COA was the most recent data available.⁶

The COA level of employment information reported the number of workers employed directly by the farmer in two categories: those that worked less than 150 days and those that worked more than 150 days. This information was suspect for several reasons. First, it duplicated farmworkers that worked for more than one farm. Second, farm workers working for farm labor contractors or for several types of non-farm businesses, such as wineries, packers or processors were not included in the COA counts. In general if such counts of contract workers were available, they would not be reliable as farmers were not supervising contract workers and therefore would probably not have reliable counts of these workers.⁷

The published COA data did have total expense cost data for both hired and contract work but not separately for crop and livestock farms at the county level. Expense data for hired labor were totals that included payroll, payroll taxes, workers compensation insurance premiums, unemployment insurance, bonuses, employer contributions to medical insurance, pension, housing, meals and other benefits. Contract expenses included payments to contractors. These payments would include the contractor's

⁶ Data from the 2002 Census were to be released two months after the completion of this contract. Calculation files were set up to allow for easy updating of that portion of the formula used here.

⁷ In the same way that many homeowners would not be able to reliably and consistently report the number of employees that home repair or remodel contractors used.

payroll, payroll taxes, workers compensation insurance premiums, unemployment insurance, and other direct costs plus the contractor's overhead and profit.

Like Unemployment Insurance data, this was industry data and not occupational data so it includes administrative workers and paid family members. The total for contracted services may have included contractors whose workers were not usually considered farmworkers. Most of the past uses for COA expense data have been to determine relative proportions of eligible populations – what percent of workers were in various jurisdictions. For example, in the ETA WIA formula, COA expense data was the basis of allocations based on percentages of a funding level. Generally, COA data has not been used to determine the number of farmworkers.

In terms of cross-state allocations, expense data would differ in its relationship to the amount of agricultural work performed because of differing levels of taxes and insurance programs required by the states. For example, in California, all agricultural workers were required to be covered by unemployment insurance, workers compensation insurance and to contribute the required employers' share of FICA (Social Security) and Medicare. Also required was short-term disability insurance but the premiums were entirely paid by deductions from the employee's wages or salary. This increased the payroll figures by the cost of employer contributions so California payroll would be more expensive relative to states that do not require these programs.

Within a state, counties generally had the same level of payroll taxes for employers. Some municipalities did have local taxes but these were generally small. Both across states and across counties, wage differences would affect the level of payroll since payroll for the same number of hours worked would be higher where wages were higher.

The 1997 Census of Agriculture data was currently available through the Internet at http://agcensus.mannlib.cornell.edu/area_to_county.php. A special tabulation of hired and contract expenses for crop farms only at the county level was available on the NAWS web site for the 1992 COA. The 1997 data was not posted but was available from DOL/NAWS. USDA has begun releasing the 2002 data but county level information was not expected until this summer.

A major disadvantage of COA data was that it was collected only from farm operators. Businesses that hired farm workers, either directly or through a labor contractor, such as a large produce processing company, that was not itself a farm operator, would not be in the census. Similarly, packinghouses that hire farm workers but did not operate farms would not be included.

a) Workers Compensation Insurance Rating Bureau Data

California had universal coverage of all workers for workers compensation insurance, including farm workers. The Workers Compensation Insurance Rating Bureau collected annual reports of wages paid to workers in all agricultural concerns that purchase workers compensation insurance. The information was available by risk categories that were de

facto occupational categories (e.g., workers in vineyards were separately considered from workers in dairies because their occupational injury or illness risks differ.). As such this was the purest information on worker payroll available. The only disadvantage was that the information did not include one or two large employers who self-insure.

The statewide data was not publicly available but could be had for a fee. It was not available on the Internet. Unfortunately, the WCIRB will only release data for multi-county areas. An exception was made for insurance companies that could obtain the data at the 3 digit zip code level. This made the data difficult to use for inter county allocations. In addition, since the multi county areas did not conform to the seven counties under consideration, they could not be used for the seven county total as well.

a) County Agricultural Commissioner Reports

The California Department of Food and Agriculture and the US Department of Agriculture both made available information from the County Agricultural Commissioners Reports. These were annual reports on agricultural production volume (tons, or other physical measure), crop acreage and crop value for each commodity in each California county. The reports did not have explicit information on the amount of labor used in each county. However the information on the relative importance of each crop could be used to develop allocation methods. This information was available on the Internet at <http://www.nass.usda.gov/ca/bul/agcom/indexcac.htm>

1. Demographic Data

Demographic data on farmworkers in the seven counties of interest was scarce and uneven. There were some case studies that include information on the lives of farmworkers in some of these counties but none of these counties has a countywide or systematic enumeration of farmworker dependents from which we could identify children of farmworkers.

To be fair, the estimates should use similar data across all the seven counties. There was only one source of county level demographic information that was consistent across all seven counties. That information was the U.S. Decennial Census of Population. The Census Bureau has discouraged the use of Census of Population data for creating size estimates of farmworkers. This was because the Census did not address seasonality since it provides a snapshot of agricultural workers in only one month of the year; and because farmworkers tend to be predominantly from historically undercounted populations. In addition, the Decennial Census did not have information on the key demographic factor related to MSHS eligibility – migration.

Without county level demographic data, estimates of the share of each county's farmworkers could be made from administrative data; however actual counts would require demographic data related to eligibility. The NAWS collected demographic data that did include program eligibility data. However, this data was not available at levels

of aggregation lower than region. Since California was a region, state level data was available.

Much of the NAWS data was available in a public access data set. However, the information on children under the age of six residing with the farmworker was only available in the full NAWS data set. To use the full NAWS data set required the permission of the Office of the Assistant Secretary for Policy at the U.S. Department of Labor. Such permission was obtained by CCMHSP.

The NAWS data for California was fairly robust as approximately 1000 interviews were conducted each year in California. Interviews were conducted throughout the year to capture seasonal variation. Interviews were conducted in nine randomly selected California counties chosen to represent all of the state's agricultural regions. Thus, NAWS findings are statistically reliable only at the state level, not at the level of individual counties or multi-county regions. By purposefully interviewing workers throughout the year, possible seasonal variations in the composition of the labor force are properly taken into account.

A. Constructing estimates

The approach used in constructing estimates of the number of migrant and seasonal children ages zero through five in each of the seven counties relied on the following general principles.

- Several different estimates would be constructed relying on different types of administrative data and different approaches to adjustment in order to identify likely ranges for the population estimates as well as better understand the strengths and weaknesses of the data.
- Multiple years of data would be used in making the estimate to smooth out the effects of production vagaries due to weather or other temporary circumstances.

The basic method used for constructing estimates was to derive a total population figure for farmworkers in each county from administrative data and then adjust that information using demographics from the NAWS to achieve an estimate of the number of children that were eligible for MSHS programs.

One of the great difficulties in estimating the size of the farmworker population was the lack of size estimates. The main reason that this occurred was the extreme seasonality of the farm work force. It was relatively easy to identify the size of the population at any one point in the year with a census or snapshot sample. And, multiple snapshots could be collected during the year. The difficult part was to identify the number of unique individuals in the farm labor population while individual workers were entering and exiting the farm labor force throughout the year.

There were only two sources of information on this. The Unemployment Insurance data was collected by Social Security number, which in theory allows EDD and/or BLS to identify the number of unique Social Security numbers reported in a year. The number of

unique individuals working in agriculture during the year has not been regularly reported to the public, but was occasionally calculated in research reports.⁸ The other source was the NAWS, which collected retrospective work histories on all sampled farmworkers and utilized these in its weighting procedure to account for seasonality.

After reviewing the sources of data, there remained two approaches to identifying an estimate of population size. One was to adjust the seasonal administrative data to achieve an estimate of the unique annual farmworker population using either SSN or NAWS data. The other option was to calculate not unique individuals but full-time equivalent (FTE) farmworkers. The FTE approach was generally easier given the nature of most of the administrative data. Fortunately, the NAWS data could produce ratios of both children per unique farmworker or children per FTE farmworker.

Both of these sources had their strengths and drawbacks. While SSNs would have the advantage of using information derived from the same administrative sources, SSNs in agriculture were less reliable than in other industries due to the high proportions of unauthorized farmworkers who often “borrowed” SSNs. This created two types of potential errors: Multiple farmworkers working under one SSN and the same farmworkers using multiple SSNs. NAWS data did not use SSN data but relied on self-reported work histories. Both self-reported work histories and employer reported work records would be vulnerable to errors. Self-reports would be subject to recall errors and employer reports would be subject to record keeping errors and in cases of unscrupulous employer to tax minimization concerns.

Using FTE’s eliminated the need to account for unique SSNs since it no longer mattered what SSN was used to report the data. However, it placed more weight on the reliability of the NAWS work histories and therefore on the one study of the relationship between NAWS respondents recall of work histories and employers reports of the same work histories to California EDD.⁹

1. Calculating size information

a) Unemployment Insurance information provided by EDD’s LMID and the Bureau of Labor Statistics.

The original plan had been to sum the monthly employment figures provided by EDD/LMID to arrive at FTE monthly figures but this data was not available by county so the BLS average employment data was used as the source of the FTEs. Average employment was the sum of the monthly employment divided by twelve and represents the average number of workers working in any given time period or the number of full-

⁸See Khan, Akhtar, Philip Martin and Phil Hardiman, “California Farm Workers: Employment and Earnings in 1991, 1996, and 2001.” Employment Development Department, Labor Market Information Division, Sacramento, California.

<http://www.calmis.cahwnet.gov/File/LMIArticles/CaliforniaFarmWorkers.htm>

⁹ This study, done by Aguirre International in the early 1990s is discussed at length later in this report.

time-equivalent workers. The BLS estimates were checked against corresponding California measures and in all cases, the calculations of average employment from LMID data corresponded closely to BLS data. The match was not exact as in some years, LMID used Standard Industrial Classification (SIC) codes in reporting and the BLS used the North American Industrial Classification System (NAICS)

To construct the estimate, annual employment was averaged for years 2000-2002. This figure was calculated for all directly hired crop workers and contract labor.¹⁰ For some counties, data was not available owing to the small number of employers reporting. This was most likely to occur in counties with low numbers of FLC workers or low numbers of ornamental horticultural production workers. See Table 2a and 2b.

Table 2a: Average Annual Full-Time-Equivalent Workers Using BLS Employment Data

County	BLS		
	Total	All Crops	FLCs
Contra Costa	1,965	1,965	Not Available
Madera	9,012	4,142	4,869
Merced	7,802	5,302	2,500
San Joaquin	13,412	8,837	4,575
Santa Clara	3,668	3,668	Not Available
Santa Cruz	7,641	7,641	Not Available
Stanislaus	10,781	4,803	5,978
Total for 7 Counties	54,281	36,358	17,923
California	322,088	191,624	130,464

Source: BLS 1999-2002

¹⁰ California EDD uses SIC codes in reporting and U.S. BLS used SIC codes in 1999 and NAICS codes starting in 2000. Crop workers were defined as SIC 01 or NAICS 111) and contract workers as SIC 076, 071, 0721, 0722 or NAICS 115115, 115116, 115112, 115113. SIC 0723 was excluded because large numbers of off-farm food processing workers are represented in the reports of employers in this industry code.

**Table 2b: Average Annual Full-Time-Equivalent Workers
Using BLS Payroll Data**

County	BLS		FLCs
	Total	All Crops	
Contra Costa	2,873	2,873	Not Available
Madera	5,703	2,705	3,007
Merced	7,217	5,637	1,580
San Joaquin	13,684	10,064	3,795
Santa Clara	5,054	4,969	217
Santa Cruz	9,748	9,582	166
Stanislaus	8,901	5,349	3,601
Total for 7 Counties	53,179	41,179	12,366
California	324,989	227,357	101,166

Source: BLS 1999-2002 payroll and wages and NAWS 1999-2001 hours and weeks

a) USDA Hired and Contract Expenses

To turn the USDA information on labor expenses into full-time equivalent workers required finding a source of per hour charges and the average workweek for agricultural workers.

The first step was to turn expenses into hours by calculating the per hour cost of farm labor. Two sources of data were consulted to determine farmworkers' average hourly wage. The first was LMID, which provided average hourly earnings for each SIC code. This data was not entirely useful, however, as it was aggregated at the regional level, from which a county-specific hourly wage was difficult to obtain.

The second source of data consulted was the NAWS. The NAWS had information on the wage at the state level only but had good information on the hourly equivalent wage for piece rate workers. The NAWS contained the hourly wage earned by each farmworker at their current farm job. For farmworkers who were paid by the hour, the hourly wage was that which was reported at the time of interview. For farmworkers paid by the piece or paid a combination of hourly wage and piece rate, hourly earnings had to be calculated. To calculate an hourly wage from piece rate, the product of the piece rate was multiplied by pieces per day and then divided by hours worked in a day. The result was then divided by the number in the crew, resulting in an hourly wage. This calculation was also done for farmworkers who received a combination of hourly and piece rate pay. The result was then added to their reported hourly earnings to get their total hourly wage.

Because the hourly wage provided by the NAWS included both piece rate equivalents and hourly wages and was available for both direct hire workers and contract workers separately, it was determined that this wage was most suitable for use in calculating weeks worked by farmworkers. The average wage of a California NAWS sample member in 1997 was \$5.74 per hour

Labor expenses included not only wages, but also employer contributions to Social Security, unemployment insurance, workers compensation insurance, and the costs of employee benefits. An estimate of 23% of wages was used for this.

Farm employers have high charges for insurance and workers compensation but provide few benefits for seasonal workers. Workers compensation insurance was about 7% of total payroll in the five-year period 1995-99, but varied greatly from crop to crop. Generally, fruit and vegetable production have higher rates, while berry and grape production have lower rates. A published article in the *Western Grower and Shipper* (March 2004) placed the total Unemployment Insurance cost for California farm operators at \$188 million per year in the state FY 2001-2002, which amounts to about 3.2% of payroll. FICA and Medicare combined amount to 7.65%. Medical insurance, bonuses, housing, meals, pensions and other benefit costs (mostly for regular or year-round workers) could be another 3% to 5% of payroll. This would result in an average mark up of 23%.

Farm labor contractors were assumed to provide growers with lower wage costs. This was done by paying lower wages to workers and providing fewer benefits. However, labor contractors charged a commission on top of wages to cover their employment related expenses. In addition to Workers Compensation, Unemployment Insurance and FICA/Medicare, the figures for contract expenses would include the contractor's markup for administrative overhead and profit. For some contractors, this subtotal was as much as 30% of payroll. In a study for EDD, Rosenberg, Vaupel and Villarejo found that inclusive commission rates for contractors were between 30 and 40% with only 3 of 111 contractors charging commissions of less than 30%.¹¹

Also obtained from the NAWS was hours worked per week, averaged from the number of hours farmworkers reported they had worked during the week preceding their interview date. The average hours worked by NAWS workers in 1997 was 42.

To convert COA labor expenses into FTEs, the first step was to divide total farm labor payroll by the average hourly wage adjusted for non-wage expenses to get the number of hours worked for the year. Next, hours were converted into weeks using the average hours of work per week provided by the NAWS. Hours worked divided by average hours per week yielded the number of weeks worked for the year. Finally, the number of FTE farmworkers was determined by dividing the number of weeks by 52. See Table 3.

¹¹ Rosenberg, Howard, Suzanne Vaupel and Don Villarejo. "Farm Labor Contractors in California," California Agricultural Studies Report number 92-2, Labor Market Information Division, Employment Development Department, Sacramento, California, July, 1992.

Table 3: Full Time Equivalent Crop Farm Workers in California

County	USDA Labor Expense	USDA Hired	USDA Contract	USDA Total FTEs
Contra Costa	15,671,341	10,741,234	4,930,107	1,092
Madera	124,410,011	70,557,930	53,852,081	8,666
Merced	117,189,092	86,977,632	30,211,460	8,163
San Joaquin	193,919,116	137,379,279	56,539,837	13,508
Santa Clara	46,940,726	41,999,661	4,941,065	3,270
Santa Cruz	75,037,501	64,202,950	10,834,551	5,227
Stanislaus	124,602,099	88,349,053	36,253,046	8,679
Total for 7 Counties	697,769,886	500,207,739	197,562,147	48,604
California	4,293,686,512	2,950,000,056	1,343,684,456	299,085

Source: USDA 1997 Census of Agriculture and NAWS 1997
 FTEs calculated using COA hired and contract labor expenses and NAWS average wages and average hours per week as well adjusted for 23% payroll expenses.

1. How to estimate farmworkers in the NAWS

b) Defining MSHS eligible workers using the NAWS

Once the size of the farm labor force has been determined, the next step was to determine what proportion of the labor force consisted of parents of migrant and seasonal preschoolers and identify how many eligible children they had.

Federal migrant programs have very complicated definitions of eligibility. For MSHS, parents must have worked in crop agriculture and migrated within the last 24 months. In addition, a proportion of children in the program must be poor.

The NAWS was a good source of information on currently migrating crop workers – those workers who have worked in crop agriculture and migrated within the last twelve months. Additionally, the NAWS contained a wealth of information on the demographics of these workers that makes it easy to apply eligibility criteria.

However, determining the number of workers who stopped migrating or left agriculture in months 13-24 was more difficult. Workers who left agriculture were estimated by a turnover rate that was described later in this section. Most turnovers and settling out of workers occurred fairly quickly in their careers. The number of first year migrant farmworkers was double the numbers who were in their second year of farmworker experience. And, the number with two years of farmwork experience was higher than

that for those with three years. Settled farmworkers numbers increased in the second year but not by a number matching the decline of migrant farmworkers. See Table 4.

Table 4: Years in Farmwork for Migrant and Seasonal Workers in California

Years in Farmwork	Migrant	Seasonal
0	41%	3%
1	17%	5%
2	4%	7%
3	3%	7%
More than 3	35%	78%
Total	100%	100%

Source NAWS 1999-2001

In a static system this would be good evidence for turnover and settlement rates. However, while the farm labor force in California has experienced fairly stable conditions during the period under study, there were other forces at work shaping the size and composition of the farm labor force. Still, this information was indicative of trends in turnover and settlement.

While it was not possible to identify many of the families that change from migrants to seasonal farmworkers, it was possible to identify settled workers who were also new immigrants. If workers had come to the United States within the last two years then they would clearly meet the migration requirement. Since the NAWS collects information on when workers entered the United States for the first time, this group was easily identified though small and was included in the estimates of migrant children below.

a) Estimating the number of migrant and seasonal children from the NAWS

For these calculations, NAWS data from fiscal year 1999 to 2001 was used. During this time period there were 3,853 California farmworkers sampled of which 806 had preschool children. Parents of preschoolers averaged less than one fifth of farmworkers during the time period under consideration. Most parents of preschoolers were settled farmworkers but very few parents having preschool children. See Table 5

Table 5: Percent of Farmworkers with at Least One Preschool Child

	US	California
Total	16%	17%
Migrant	4%	2%
Seasonal	12%	15%

Source: NAWS 1999-2001

Preschoolers in the NAWS were identified using the NAWS family grid. The family grid contained information on each member of the farmworkers household as well as dependents living elsewhere. Children ages zero through five living with a farmworker parent in California were identified. Children were classified as seasonal or migrant based on their parents status. The NAWS defined an individual as a migrant if they travel more than 75 miles to obtain a farm job. While some commuters may have traveled more than 75 miles, the vast majority of migrants traveled long distances to obtain farmwork.

Children were also included in the calculations if they had migrant parents whose home base or non-farmwork time was spent in California. These children were defined as preschool children on the NAWS family grid whose parents resided in California during the year but did no farmwork in California.

Once migrant and seasonal children of preschool age in the state of California were identified, they were assigned a weight based on whether one or both parents performed farmwork. This weight eliminates the double counting of children who have two farmworker parents and thus two chances of being sampled by the NAWS. The weight was approximated as the ratio of one divided by the number of parents in farmwork. This ratio was one if there was only one farmworker parent and $\frac{1}{2}$ if there were two farmworker parents. This weight was then multiplied by the NAWS sampling weight to create the final weight for the children.

Once weighted, the number of children was summed to get the total number of migrant and seasonal children in the California sample. To apply this number to the administrative data, it had to be expressed in comparable units. For both the BLS and USDA data, this unit was children per FTE farmworker. To calculate the number of FTE workers in the NAWS, the number of weeks worked in farmwork was obtained from the NAWS work grid. Workers supplied the dates worked for each farm job in the year before their interview. The total number of weeks worked in agriculture by NAWS workers was calculated and divided by 52 to obtain farmworker FTEs. Then the ratio of children per FTE was calculated.

Table 6 Estimates of Preschoolers (Statistically Weighted) per NAWS FTE in California

	FTE Farmworkers	Preschoolers	Migrants	Seasonals
All farmworkers Numbers	2,299	487.94	50.18	437.76
All farmworkers Ratio per FTE farmworker	-	0.21	0.02	0.19

Source: NAWS 1999-2001

a) Accounting for turnover

As mentioned above, the problem in the NAWS was determining the proportion of the eligible population that was not currently migrating. Farmworkers who migrated within the last 12-24 months could still be working in seasonal agriculture as settled farmworkers or these families could have left agriculture for other industries.

To identify the proportion of workers who left agriculture, Aguirre International developed estimates of turnover from agricultural work. These were estimated using NAWS information on the proportion of new farmworkers and information on the growth of the agricultural sector.

New farmworkers were easily identified within the farm labor force. The NAWS estimates that 29% of California farmworkers were new to agriculture each year. Most of these workers were young single men. The proportion of preschool parents entering the farm labor force was much smaller. Only 2% of the farm labor force consists of parents of preschool children new to farmwork.

To be used as a proxy for turnover, the number of newcomers to agriculture needed to be adjusted for growth or shrinkage in the agricultural sector. If the agricultural sector was neither shrinking nor growing and productivity was constant, then the number of newcomers would equal the numbers of those exiting farmwork. If agriculture was expanding and new jobs were being created, then the number of those exiting would be lower than the number of newcomers and vice versa if the agricultural sector were shrinking.

The third factor that affected turnover was productivity. If workers in agriculture were becoming more productive each year then there was less need for new workers. Unfortunately, there was little information on productivity gains within agriculture for

this time period. Since the period being looked at was one year, it was assumed that growth in productivity from one year to the next was very small or negligible. This would not be true if there were major technological innovations occurring such as when the tomato harvester was introduced. However, changes in productivity during this one year time period were probably incremental.

Other exogenous factors such as a change in immigration policy might have affected the turnover rate. However, there had been few changes in immigration policy or other exogenous factors that might affect agricultural turnover or retention in the period under study. There was speculation that the 9/11 attack might have interrupted migration patterns in 2002. However, this study was using data collected up through September 2001 and was thus unlikely to have been affected.

For the turnover calculations, labor usage was assumed to be proportional to the amount of agricultural activity, which in this case was being measured by acreage. If acreage increased then more workers would be needed and if acreage were declining, fewer workers would be needed.

Table 7 shows the changes in acreage of California and the seven counties administered by CCMSHS. Total acreage in crops for California increased and then declined in this period. Individual county trends differed from the California trend with some counties having clear increases or decreases and other counties fluctuating.

Table 7: Acreage in Crops 1998-2002

Location	Total Acreage				
	1998	1999	2000	2001	2002
Contra Costa	33,964	32,836	31,480	29,246	26,563
Madera	281,075	276,360	302,610	298,220	306,320
Merced	514,861	514,628	503,793	512,899	528,207
San Joaquin	570,345	565,100	548,940	576,718	567,928
Santa Clara	24,738	22,963	21,393	20,692	20,692
Santa Cruz	19,495	18,623	19,652	20,767	18,149
Stanislaus	387,165	380,538	386,435	394,596	394,150
Seven counties	1,833,641	1,813,047	1,816,303	1,855,139	1,864,011
California	9,295,576	9,397,847	9,528,438	8,975,370	8,911,280

Source: County Agricultural Commissioner Reports, USDA

Combining information on the number of new arrivals and the numbers of acres in production showed that overall turnover rates could be estimated by subtracting the change in agricultural acreage from the rate of entering farmworkers.¹² See Table 8. This

¹² Three year running averages were used for changes in acreage to smooth out any incidental year to year fluctuations.

means that if the number of newcomers equals the rate of increase in acreage then turnover was zero. In situations of expanding acreage, turnover would be lower than it appears from the newcomer rate. And vice versa, where acreage was declining, turnover was higher than the number of new entrants to the farm labor force. Estimates of turnover rates averaged between zero percent and four percent.

Table 8: Turnover Rates for Migrant Parents

	Average Acreage		Average % Change in Acreage 1998-2002	Migrant Parent Newcomer	Turnover Rate
	1998-2000	2000-2002			
Contra Costa	32,760	29,096	-11%	2%	13%
Madera	286,682	302,383	5%	2%	-3%
Merced	511,094	514,966	1%	2%	1%
San Joaquin	561,462	564,529	1%	2%	1%
Santa Clara	23,031	20,926	-9%	2%	11%
Santa Cruz	19,257	19,523	1%	2%	1%
Stanislaus	384,713	391,727	2%	2%	0%
Seven counties	1,820,997	1,845,151	1%	2%	1%
California	9,407,287	9,138,363	-3%	2%	5%

Source: County Agricultural Commissioner Reports: USDA, NAWS 1999-2001

Applying the turnover statistics to the FTE's was a straightforward process. The FTEs in each category were increased by the turnover rate for that county. See Table 9.

Table 9: Ratios of Children per FTE in Agriculture

County	Turnover Rate	All farmworkers	Migrant	Seasonal
* Base ratios of children per FTE' for workers currently in agriculture				
California NAWS	-	0.21	0.02	0.19
Ratios of children per FTE adjusted for workers leaving agriculture				
Contra Costa	13%	0.24	0.02	0.22
Madera	-3%	0.20	0.02	0.18
Merced	1%	0.21	0.02	0.19
San Joaquin	1%	0.22	0.02	0.19
Santa Clara	11%	0.24	0.02	0.21
Santa Cruz	1%	0.21	0.02	0.19
Stanislaus	0%	0.21	0.02	0.19
Seven Counties	1%	0.21	0.02	0.19
California	5%	0.22	0.02	0.20

1. Calculating the number of children in the seven California counties.

The final step in constructing the estimates was to combine the NAWS demographic information on the distribution of migrant and seasonal children with the estimates of the size of the farm labor force derived from administrative data sets.

a) Combining NAWS and BLS data

Combining the NAWS and BLS data required making adjustments for the different ways in which the two data sources collected similar information. As mentioned previously, direct comparison of NAWS and BLS data showed that for 83% of NAWS workers with California work periods, 93% of their workweeks were reported to the California Employment Development Department. Those 17% of workers in the NAWS who were not reported to EDD worked slightly less about 91% of the time of those reported to EDD. This means that applying the NAWS FTE ratios to the BLS FTEs would result in an underestimate of the number of preschool children of farmworkers. Taking account of the time not reported for both groups showed that 23% of the work time of NAWS sample members was not reported to EDD. The ratio of time reported to the NAWS divided by time reported to BLS showed that NAWS results should be increased 29% to account for the difference in data collection methods. Accordingly, the BLS FTEs in Table 10 have been increased by this amount (compared to Table 2).

Table 10 showed the results of multiplying the ratios of children per FTE derived from NAWS by the adjusted BLS FTEs. Estimates were constructed using BLS payroll and BLS employment data.

b) Combining NAWS and Census of Agriculture data

Combining the NAWS and Census of Agriculture data was more straightforward. There were no studies that indicate any correction factors that could be applied. To use COA FTEs to estimate the number of preschool children in the seven counties of interest, COA FTEs were multiplied by the NAWS estimate of the average number of migrant and seasonal preschoolers per FTE of farmwork. (See Table 10)

Table 10 Distribution of Migrant and Seasonal Children ages 0 through 5

County	Census of Agriculture				Unemployment Insurance Data (BLS)				Unemployment Insurance Data (BLS)			
	FTEs	Total Children	Migrant Children	Seasonal Children	Employment FTEs*	Total Children	Migrant Children	Seasonal Children	Payroll FTEs*	Total Children	Migrant Children	Seasonal Children
Contra Costa	1,092	262	27	235	2,542	611	63	548	3,716	893	92	801
Madera	8,666	1,775	183	1,592	11,658	2,388	246	2,142	7,378	1,511	155	1,356
Merced	8,163	1,754	180	1,573	10,092	2,168	223	1,945	9,336	2,006	206	1,799
San Joaquin	13,508	2,908	299	2,609	17,350	3,735	384	3,351	17,701	3,811	392	3,419
Santa Clara	3,270	771	79	692	4,745	1,119	115	1,004	6,538	1,542	159	1,383
Santa Cruz	5,227	1,116	115	1,001	9,885	2,111	217	1,894	12,610	2,692	277	2,416
Stanislaus	8,679	1,845	190	1,655	13,946	2,965	305	2,660	11,514	2,448	252	2,196
Seven Counties	48,604	10,431	1,073	9,358	70,218	15,096	1,552	13,543	68,794	14,902	1,533	13,370
California	299,085	66,549	6,844	59,705	416,657	92,710	9,534	83,176	420,410	93,545	9,620	83,925

*BLS figures adjusted to account for differences between NAWS and BLS collection of work history information

A. How do these estimates compare to each other and to other estimates

1. How do these estimates compare to each other.

In the previous section, three estimates were calculated: two based on Unemployment Insurance data and one based on Census of Agriculture data. The first task in assessing the estimates was to look at how consistent they were. Since the methodology involved multiplying the same NAWS children/FTE factor by an FTE estimate, most of the difference between the estimates is due to the FTE calculation.

Table 11 shows the proportion of FTEs in each county relative to the seven county total. The fifth column contains the spread of the estimates, the distance between the highest and lowest estimate. The final column calculates the ratio of the spread to the average estimate. The estimates conform to the usual pattern – smaller estimates have greater variability than larger estimates. For example, Contra Costa County has the largest relative range and San Joaquin and Stanislaus the smallest.

Table 11. Percent of FTE's in each of seven counties						
County	COA Hired and Contract	BLS Employment	BLS Payroll	Average	Difference high/low	Difference/average
Contra Costa	2	4	5	4	3	84%
Madera	18	17	11	15	7	47%
Merced	17	14	14	15	3	22%
San Joaquin	28	25	26	26	3	12%
Santa Clara	7	7	10	8	3	36%
Santa Cruz	11	14	18	14	8	53%
Stanislaus	18	20	17	18	3	17%
Seven County Total	100	100	100	100		

Table 12, looks at similar statistics for the proportion of the state total that is comprised by the seven counties. This proportion is remarkably consistent over the three sources of data: USDA Census of Agriculture, and Unemployment Insurance data measured in terms of payroll and employment level.

Table 12: Measures of relationships among estimates

Shares of seven county region	
COA Hired and contract payroll	16.3%
BLS Employment	16.9%
BLS Payroll	16.4%
Average	16.5%
Range (High-Low)	0.6%
Range/Average	3.6%

This implied that while estimates of the MSHS population will vary, CCMHS could be relatively confident about its relative share of the MSHS population in California as independent sources of data agree fairly closely. CCMHS' proportion of crop agriculture is 16-17% and thus it is likely that CCMHS should expect to have in its service delivery area 16-17% of the qualifying children.

There was less consistency within the seven county area and allocations to individual counties are more difficult to make. The smaller the proportion of agriculture in a county, the less certainty there was about the estimate. Contra Costa would be expected to have very few children but that expectation is more subject to the influence of events. For example, if a producer went out of business or relocated or a migrant camp opened in Contra Costa County, that would have a relatively large influence on how the estimates conform to reality and how vulnerable the estimates are to change. A similar sized event in Stanislaus County would have much less effect on the level of services as there are so many producers that the relative impact would be small and the likelihood of an offsetting event, such as the development of a new vineyard or the closing of a migrant camp, would be higher.

1. How do these estimates compare to other estimates.

The next step in assessing the estimates was to compare these estimates with two other existing sets of estimates of the MSHS population. The first estimate used for comparison was the Migrant Health Enumeration project discussed earlier in this document. These estimates were based on a demand-for-labor model and based on USDA data and input from local and state level stakeholders. Though this study did not provide county level estimates of migrants, Aguirre staff constructed some using values in the Larson report. Estimates were made by taking 16.5% as the share for the seven counties and multiplying that by the state level estimates for children under 5.

Table 13 Comparison with other estimates

	Larson		Xtria +		Aguirre	
	CA	7 Counties Estimate ^{13*}	CA ¹⁴	7 Counties Estimate*	CA Average	7 Counties Average
All Children	128,191	21,152	68,109	11,238	84,268	13,904
Migrant	33,173	5,474	15,005	2476	8,666	1,430
Seasonal	95,018	15,678	53,105	8,762	75,602	12,474

*Calculated as 16.5% of the adjacent column.

The other possible benchmark was found in a report by Xtria, commissioned by the US Department of Health and Human Services identifying the numbers of migrant and seasonal children per state. The Xtria estimates are interesting because they apply the NAWS data to 1997 COA data and thus share some similarities in methodology. The Xtria estimates use national NAWS data for their adjustments while the Aguirre estimates use California NAWS data. Again this study did not make county level estimates but approximations were made by multiplying the estimates by 16.5% to give a measure for the seven county region. Since the Xtria estimate undercounted California farm work by not including farm labor contractors, both the Xtria numbers and the corresponding seven county estimates were multiplied by 1.45 to make them more comparable (noted as Xtria+).

The estimates developed for CCMHS fall somewhere in the middle between these two. They are close to but generally greater than the Xtria estimates in terms of total children. (See Table 13.). However, while the estimates are close at the state level, they diverge more for estimates of the seven counties. In addition, different methods were used to adjust the data and the Xtria estimates used national NAWS figures that were based on data collected from 1993-1998.

The Larson estimates are generally higher than both the Xtria and CCMHS. This is to be expected given the differing migrant eligibility criteria. The Larson estimates include food-processing workers who are not eligible for MSHS. In addition, the Larson estimates are based on different time periods. Larson used 1993-1997 NAWS and 1996-1997 Association of Farmworker Opportunity As a result, her estimates showed a higher percentage of migrant and seasonal children than shown in the 1999-2001 NAWS data used for this report. Her estimates are included here, as others have used this data as a

¹³ Note the seven counties proportion is not an estimate done by Xtria or Larson. It is calculated by Aguirre as 16.5 percent of the respective state estimate. As mentioned, the Larson estimates are included here only because they are popular. They are based on a different migrant definition that includes food-processing industries.

¹⁴ This estimate is based on the Xtria estimate but is modified to include farm labor contractor employees that were omitted from the original calculations.

benchmark. However, based on both method and time period examined, it should not be considered to be strictly comparable for MSHS programs.

In conclusion, the estimates developed for this study are internally consistent and in line with existing estimates of the migrant and seasonal preschool population. Divergences are clearly explained by differences in methods. The seven counties share of the California total is very consistent over several sources of administrative data that are collected using different methodologies. However, individual county estimates are subject to greater fluctuation depending on the size of the county. In general, counties with larger populations are more stable than smaller counties.