THE NUMBERS AND DISTRIBUTION OF MHS-ELIGIBLE CHILDREN IN THE UNITED STATES

APPENDIX C OF

STUDY OF THE CHARACTERISTICS OF FAMILIES SERVED BY HEAD START MIGRANT PROGRAMS

BY

ANNE STEIRMAN, EDWARD KISSAM AND JORGE NAKAMOTO.

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Introduction

Our estimation of the size of the farmworker population eligible for Migrant Head Start (MHS) services requires three steps. The first step is to estimate the size of the total population of migrant and seasonal farmworkers in the United States. The second step is to estimate the proportion of the overall farm labor force that is made up of migrant families with young children eligible to participate in MHS programs. The third, and most challenging, step is to analyze and depict the geographic distribution of the population of migrant families with MHS-eligible children, and the amount of time they spend at each location.

It is useful to review the conceptual challenges faced by researchers, program planners, and policy analysts in their efforts to understand the constantly changing geographical distribution of the farm labor force and to profile the population accurately. This research can serve as a basis for systematically configuring program services to meet the special needs of specific subpopulations in the farm labor force, such as the migrant families with preschool children who make up the MHS target population.

Analytic Issues

There is a long and contentious history of research efforts, policy debates, and program planning dilemmas relating to the challenge of estimating the numbers of farmworkers in the United States and accurately profiling their demographic and socioeconomic characteristics. Dr. Philip Martin of the University of California at Davis

has published extensively over the past two decades on the analytic problems of developing this data on the migrant and seasonal farmworker population using standard datasets.[1]

We provide below a discussion of the three broad kinds of analytic problems associated with the generation of reliable population data on farmworkers in order to provide data users a clear idea of the implications of our estimation of the numbers of MHS-eligible families.

Definitional Issues

Differing statutory and regulatory definitions of who is a farmworker and which farmworkers are migrants or non-migrants have burdened service providers, federal program administrators, and data analysts since the late 1960s. At that time, the original, relatively loose definitional framework used by the Office of Economic Opportunity (OEO) in programs targeted to migrants was made more rigorous at the same time that programmatic responsibility for different types of services was decentralized as OEO programs were taken over by the federal agencies that now operate these programs (DHHS, DOL, Dept. of Ed., HUD, and USDA).

Federal programs for farmworkers have been targeted to a socioeconomically disadvantaged group of farm laborers excluded from the legal protections afforded to non-agricultural employees under the National Labor Relations Act of 1935. Nevertheless, practical efforts to define the service population have been problematic both for researchers dealing with planning and policy issues and for service providers in terms of determining individual farmworkers' eligibility (which requires fairly complex intake screening of prospective service applicants).

[1] See Martin and Martin (1988) for a discussion focusing primarily on the analytic issues. A discussion oriented primarily toward the program planning issues can be found in Martin and Martin (1992).

A study by David Martin and Philip Martin (1992) reviews the definitional issues. The key elements are as follows:

- the specific farm labor activities considered to constitute “farmwork;”
- the income screening level used for determining eligibility;
- the “look back” period to determine whether a person who is not presently working in farmwork should still be considered a farmworker based on previous work;
- the operational specification of “migrancy;” and
- the operational specification of “seasonal work,” particularly the minimum and maximum amounts of farmwork that need to be performed for someone to qualify as a farmworker.

One dimension of the definitional problem is that planning for farmworker service programs must be based on one of several datasets, each of which has deficiencies. In practical terms, this has implications for determining what the universe of need for MHS services might be. Many of the datasets that are used for estimating numbers of farmworkers are not useful for MHS planning because they include no demographic information. For example, in states such as California where the Unemployment Insurance (UI) data are of high quality and where virtually all farmworkers are covered by UI, data reported by agricultural employers to the state employment service are useful for estimating the size of the labor force and tracking changes, but not for program planning since they only include information on earnings. Datasets generated as a by-product of management and information systems of various programs such as the Migrant Student Record Transfer System are not useful for research purposes because they reflect only the subpopulation eligible under the guidelines of these programs.

The introduction of the National Agricultural Workers Survey (NAWS) in 1988 provided an innovative and practical solution to the multiplicity of definitions of farmworker by identifying and surveying persons who were doing farmwork, and collecting a rich inventory of data on the characteristics, earnings, and migration pattern

of respondents and their families. Consequently, researchers can now construct a customized definition of "farmworker" or "migrant farmworker" that corresponds to the statutory and regulatory provisions governing any specific program.[2] Thus, for the purposes of this analysis, we have created a Migrant Head Start Population Database consisting of the subset of the overall population of farmworkers whose children are eligible to be enrolled in MHS.[3]

Data Quality Issues

The Problem of Capturing and Presenting Data on a Mobile, Seasonally Unemployed Population. Virtually all datasets on the U.S. farm labor force consist of snapshots of the population, that is, data from a cross-sectional survey or census of the population. Because the farmworker population works seasonally and the subpopulation of migrants is, by definition, mobile, program planning requires a dataset with information on the annual cycle of migration. Unless such a year-long, longitudinal succession of data points tracing out the travel of individual migrant families is available, there are bound to be serious problems with duplication arising from counting the same families more than once in different locations. There are also likely to be additional problems due to farmworkers' migration patterns because they are not represented in seasonal snapshots when they are out of the county (e.g., in Mexico).[4] There are also problems due to seasonality when some families are not recognized as being farmworkers because they are not working in farm work at the time of a cross-sectional

[2] The definition used for the purpose of this analysis is the one used by the Migrant Programs Branch of the Head Start Bureau, prior to the 5/18/94 amendment to the Head Start Act: "A migrant family is a family with children under the age of compulsory school attendance who changes their residence by moving within the last twelve months from one geographic location to another, either intrastate or interstate, for the purpose of engaging in agricultural work that involves the production and harvesting of field and tree crops, and whose family income comes primarily from this activity."

[3] The NAWS actually surveys "seasonal agricultural services" workers. From a definitional perspective, this conforms ideally to the MHS regulatory language which refers to "crops," as the sampling frame excludes some agricultural workers who do not work in crops, most notably livestock workers. It also excludes migrant fishermen and forestry workers who are likely to be excluded under the regulatory language governing MHS eligibility.

[4] See Gabbard, Kissam, and Martin (1993), for example, for estimates of the numbers of farmworkers missed by the decennial census because they are in Mexico.

survey or census. In order to meet the needs of program planning, the dataset and resulting distributional analysis must provide a means of depicting farmworkers in both home base areas where they may live during the off-season and upstream areas where they may live only during peak harvest periods.[5]

NAWS is unique among federal data sources on the farm labor population in that it provides a continuous picture of each respondent's moves by asking a series of questions which generate a migration grid, providing a week-by-week history of where a farmworker has worked, been unemployed, or even "rested" without actively being in the labor force.[6] NAWS also records the crops worked and the reasons for moving to the next destination. Thus, NAWS data makes it possible, by aggregating the records of individual family moves, to generate a migration profile for the entire farm labor force or for any subpopulation (such as MHS-eligible families). This profile is a continuous record of the patterns by which migrant farmworkers move around the country over the course of all four seasons.

This overall profile of national migration (and the component subprofiles) yields a particularly useful tool for looking at the distribution of the nation's migrant farmworkers over time. In fact, the task of depicting migration patterns (which involve both spatial and time dimensions) is not trivial. While other datasets provide a single (and arbitrary) depiction of the national distribution of migrants, NAWS provides a superior tool for resource allocation since there is a basis for determining how many resources should

[5] There has, traditionally, been a tension between areas recognized as "home base" areas and areas considered "upstream." In fact, many states such as Florida, Georgia, California, and Washington are both home base areas and upstream areas (depending on the migration pattern of each individual family). Community case studies (Griffith and Kissam, 1995), analyses of NAWS data (Mines et al., 1991; 1991;1993), historical analyses (Nodin Valdes, 1991), and specialized surveys (Briody, 1985) show major historical shifts in migration patterns. Key changes include: (a) massive increases in farmworkers homebased in Florida, (b) decreases in numbers of migrant families homebased in the lower Rio Grande Valley of Texas, © population diffusion into "new" settlement areas such as Georgia and Iowa, and (d) increased settlement in the Pacific Northwest. Times series analysis of NAWS data would permit detailed examination of these population shifts, but these analyses have not been performed.

[6] The NAWS survey requests exact dates for each "period" (i.e., time spent at one location with one employer), and there are likely to be recall problems regarding exact dates, but it is believed that these data are reliable to the week.

be devoted to service in each region, as well as when such resources should be made available.[7] The findings we report in this study provide not only an estimate of the total "universe of need" of MHS-eligible children (e.g., a head count), but also a time-weighted depiction (alternatively expressed either as full-time equivalents or as person-months) of the population's spatial distribution for the purposes of resource allocation.[8]

Available Resources for Estimating the Size of the U.S. Farmworker Population. Each source of data on the U.S. farmworker population has characteristic limitations in estimating the U.S. farmworker population — either in terms of adequacy (detail, comprehensiveness) or validity. Consequently, the best strategy for estimating the size of a farmworker population (and its characteristics) is usually one that relies on multiple databases, using the most appropriate database (i.e., one which is adequate and valid) at each step of the analysis.

There is no single data source containing an accurate estimate of U.S. farmworkers. The only national data source that tries to count U.S. farmworkers is the United States Census. However, the census has numerous disadvantages. The census samples households on April 1, a day when few farmworkers are working in farm work and when most are in home base communities that are often far from areas where they work during the peak harvest season. This gives rise to a biased profile of the geographic distribution of farmworkers and an overall undercount. NAWS shows that about one in ten farmworkers are not in the country in April (Gabbard, Mines, and Boccalandro, 1994). Also, because the census asks respondents about their last job, the many farmworkers who participate in farm work for only a few months of the year (typically in the late summer) are not counted as farmworkers in the census.[9]

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[7] The seasonal profile is not reported in the current study because the national aggregate consists of hundreds of subtly differing seasonal patterns of migration.

[8] These data on migration patterns, for example, can provide information for program planners on scheduling seasonal centers to open in anticipation of migrants arriving and closing when they leave. Presumably, service "mix" and service strategy might ideally be fine-tuned to better respond to the cyclical rhythms of migrants' lives.

[9] There are regional variations in rates of census non-identification of farmworkers due to "occupational

Farmworkers often live in housing which may have no formal mail address, is hidden off the road, or is actively concealed because housing accommodations are substandard or overcrowded. Thus, it has been demonstrated that a high proportion of entire farmworker households are omitted from the census.[10] Further factors involved in the census undercount include the fact that the census form that is mailed out is in English (although a Spanish-language form is available if ordered by phone) and the literacy competencies required to complete the form correctly are well beyond the typical educational attainment of farmworkers.

Gabbard, Kissam, and Martin (1993) have used meta-analytic techniques in combination with regression modeling to demonstrate that the Census Bureau microdata from the 1990 census underestimated the size of the farmworker population by approximately 50%.[11] The patterns of census undercount are well defined and result in a serious degree of sample bias in profiling that part of the farmworker population that is successfully enumerated and identified in census data.[12] The Census Bureau is aware of these severe shortcomings and has urged federal agencies not to use this data source for planning farmworker service programs.[13] Consequently, we do not use census data in analyzing the size, distribution, and characteristics of the MHS-eligible population.

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blocking" (i.e., inability to identify a farmworker because he or she has had an intervening non-agricultural job prior to Census Day). For details, see Gabbard, Kissam, and Martin (1993).

[10] David Fein and Kirsten West (1989) have written extensively on "unusual" (i.e., non-standard) housing units as a cause of census omission.

[11] Subsequently, Under-Secretary of Commerce, Administrator of the Economics and Statistics Administration, wrote to all federal statistical agencies advising them that decennial census data were not appropriate for estimating farmworker population size.

[12] Kissam has reviewed public use microdata set (PUMS) data on Florida farmworkers and noted gross inaccuracies in terms of demographic characteristics. For example, the PUMS data show a much higher proportion of African-American farmworkers in Florida than have been observed in any recent study. This disparity in ethnic profile, together with a disparity in English-speaking ability of census-identified farmworkers in California suggests that the census does a much better job of representing farm labor contractors and supervisors than field workers.

[13] Letter from Undersecretary of Commerce Dr. Everett Ehrlich to federal agencies, August, 1993.

Small-Area Estimation Issues

While there are approximately 1.5 million U.S. farmworkers, the farmworker population makes up a very small proportion of the total U.S. population. Consequently, standard data series such as the Bureau of the Census' Current Population Survey (CPS) do not yield a large enough sample size to provide reliable data on the national population. This problem of estimating "small" populations is exacerbated when an attempt is made to estimate the size or characteristics of a subpopulation in a smaller geographical area. This problem affects NAWS as well as the census. Thus, there are some difficulties in extrapolating downward from larger geographical units, in this case regions, to smaller geographical units, in this case states. These difficulties are minimized, but not completely eliminated, by using the meta-analytic techniques adopted for this study.[14]

[14] The only possible approach to resolving this problem is to increase sample size. Edmonston (1994) makes the data policy argument that it is more cost-effective to increase the sample size of various "special purpose" surveys, such as the NAWS, than to attempt to increase the sample size of the 5% sample of the decennial census to yield reliable small-population or small-area estimates of hard-to-count populations, such as farmworkers.

Analytic Methodology

General Approach

The methodology used in the current study is adapted from meta-analytic strategies developed by Aguirre International researchers and colleagues and reviewed in detail by a study group of farm labor researchers convened as part of a National Academy of Sciences study of new census methodologies.[15] The specific meta-analyses were prepared by Beatriz Boccalandro (a consultant to the NAWS research team) and reviewed by Dr. Philip Martin, a national expert in the field.

Estimation Step 1

Calculation of the Numbers of Farmworkers in the United States. In the absence of accurate census information on U.S. farmworkers, other data sources become imperative in counting this population. Fortunately, there are two excellent data sources that, used together, yield a national estimate of U.S. farmworkers: the U.S. Department of Agriculture (USDA) Farm Labor Survey (FLS) and NAWS. Both of these surveys circumvent the difficulties of capturing the farmworker population with household-based sampling by sampling employers. Furthermore, both surveys take place multiple times during the year to capture this seasonal population. The USDA National Agricultural Statistic Service (NASS) office counts filled jobs in U.S. agriculture on a quarterly basis in the FLS. The FLS number covers a one-week time frame. In order to convert the FLS counts into the annual number of farmworkers, information on farmworker seasonality and turnover is necessary. The work histories in NAWS make possible a calculation of the number of workers captured in one FLS quarterly one-week snapshot who were counted again in the same or another quarter. NAWS captures those farmworkers who did not work in any of the four weeks covered in the FLS time

[15] Richard Mines and Ed Kissam collaborated informally to flesh out the service planning implications of generating time-weighted estimates of migrants' distribution, while Susan Gabbard, Ruth Samardick, and Beatriz Boccalandro developed specific meta-analytic strategies. See Edmonston (1994), who discusses the utility of such techniques in the context of the small-area estimation problem faced by the census.

frames. Adjusting the sum of the FLS data with the information from NAWS yields a valid estimate of the number of U.S. farmworkers.

U.S. Farm Labor Force — Calculation Results.

- The sum of hired field workers that FLS counted in the four quarters from October 1994 to July 1995 was 2,884,000.
- The NAWS found that, between July 1994 and July 1995, 13% of farmworkers were not captured in FLS statistics while 25% were counted twice, 18% three times, 11% four times, and 5% five times (i.e., those who had more than one farm job during a survey week). This indicates that simply summing up the quarterly FLS figures results in an overcount of 101%.
- Adjusting the sum of the FLS figure to account for the overcount yields an estimate of 1,435,000 U.S. hired crop agriculture field workers (henceforth referred to simply as "farmworkers").

Estimation Step 2

Calculation of the Total Number of MHS-Eligible Children. The second step is to determine the total number of MHS-eligible children by estimating the proportion of the total farmworker population that has MHS-eligible children and multiplying this by the average number of eligible children per farmworker. The computation for the percent of MHS-eligible children can be derived from NAWS, using data collected between October 1992 and September 1995.

Below we describe how the NAWS-based definition of MHS-eligible children relates to the specific language of MHS regulations. NAWS has data on a representative sample of farmworker children, including demographic information, from its collection of household information. A child is considered to be MHS-eligible if he/she:

- *Has a farmworker parent who migrated in the last two years.* The MHS regulations consider a family to be a migrant family if it has changed residence

by moving from one geographic location to another in the preceding 24 months. In NAWS, farmworkers are considered migrants if they travel 75 miles for farm work or if they report having to change their place of residence to seek or perform farm work during the 12 months preceding the interview. Moves within Mexico or within any other foreign country do not count as migrations. It is assumed that migrant parents with children in the United States migrate at least once with their children, making them a migrant family. Because NAWS cannot currently determine if a farmworker has migrated over the preceding 24 months, it uses a 12-month period. This makes the estimate of those families who meet MHS' criteria for migrancy a conservative one. Analysis of NAWS data collected between 1989 and 1991, when 24 months of work history were collected, indicates that 85% of those who migrated over a 24-month period also migrated over 12-month period. It appears that increasing the period from 12 months to 24 months would increase the number of eligible families by 14%.

- *Is under the age of six.* MHS regulations define the preschool target population as "a family with children under the age of compulsory school attendance." In our NAWS-based analyses, we include only families with children under the age of six (five years old and younger) at the time of their NAWS interviews.

- *Lives in the United States.* MHS regulations require that the child live in the United States at the time they are served by MHS. In our analysis, a qualifying child has to live in the United States at the time of the NAWS interview.

- *Has a family income that is below the poverty threshold*. In Head Start regulations, the core service population must come from families that have incomes below the federal poverty line, although up to 10% of the children served by Head Start programs can come from families whose income exceeds the income threshold. In our NAWS-based analysis, the household also has to live in poverty as defined by the DHHS. Although our analysis can be adjusted to estimate the overall MHS-eligible population (including 10% over-income), the

estimate we provide is of the core population who are eligible on the basis of income.[16]

- *Has a farmworker parent with half of his/her income in the year preceding the interview originating from U.S. agriculture.* According to MHS regulations, the family served must be one "whose family income comes primarily from this activity" [the harvesting of field and tree crops]. In our estimate, the parent interviewed by the NAWS has to have at least half of his/her income of the previous year stem from work in U.S. agriculture. Like Head Start regulations, the NAWS definition of farmworkers includes workers "harvesting field and tree crops."

Calculation.

- NAWS data indicates that 6.1% of U.S. farmworkers (or 88,000 farmworker parents) have MHS-eligible children in their households.
- Farmworkers in these MHS-eligible households have an average of 1.06 children under the age of 6.
- The 88,000 farmworker parents with MHS-eligible children multiplied by 1.06 children results in 93,000 MHS-eligible children.

This figure of 93,000 MHS-eligible children is an estimate of the number of unduplicated MHS-eligible children (i.e., the "head-count" of MHS-eligible children in the nation), as opposed to a time-weighted or full-time equivalent (FTE) count.

Estimation Step 3

[16] In actuality, because prevailing wages are low and work is seasonal very few migrant farmworkers are over the poverty guidelines. Analysis of NAWS data shows that relaxing the poverty eligibility criterion would increase the number of MHS-eligible children by 20%, to a total of 110%.

Estimating the national distribution of MHS-eligible children. The distribution of MHS-eligible children needs to be computed as a time-weighted variable in order to capture the proportion of the year the migrant family spends in each state. We refer to this variable as the number of MHS FTEs. This is essentially a measure of the particular slice of time MHS-eligible children spend in different states. The calculation of MHS FTEs by state is, therefore, an estimate of the aggregate amount of time that all the households with MHS-eligible children spend in each state during the course of a year.[17]

This approach eliminates the traditional home base state problem (where home base states are underrepresented in data sources that use farm expenditures or estimated amounts of farm labor to estimate numbers of farmworkers). The approach used here allocates a proportional slice of a migrant family's 12-month annual migration circuit to each state according to the total time the households of MHS-eligible children spend in each state, regardless of how much farm work the worker did. Thus, a state (such as Texas) where many farmworkers reside part of the year without doing farm work is not slighted as it might be in an allocation based exclusively on crop production data. At the same time, however, states where farmworkers work but do not reside long-term (such as Maryland and Delaware) are also equitably represented based on the amount of time Florida-based or other Eastern stream migrants work in these states.

The estimation of MHS-eligible FTEs by state is based on separate calculations of the time spent in each state doing farm work and of the time spent in each state while not doing farm work. These components are calculated separately in order to use the most appropriate data source for each.

Since the answer to the question regarding the best way to distribute available resources to serve MHS-eligible families while they are in the United States is central to

[17] It is assumed that U.S.-based children who are MHS-eligible are with their farm working parent throughout the year.

resource allocation, the national number of "full-time-equivalent (FTE) MHS-eligible children" is the most appropriate basis for estimating the distribution of the MHS-eligible population. The unduplicated estimate of 93,000 MHS-eligible children must be adjusted to account for the time these children and their families spend out of the country.

NAWS indicates that MHS-eligible children spend, on average, 12% of the year abroad. Thus, the unduplicated count of 93,000 MHS-eligible children represents 82,000 Migrant Head Start FTEs. It should be remembered, however, that the population estimate of 93,000 MHS-eligible children represents an unduplicated count of the MHS-eligible population, and that it excludes the 10% that can exceed the income threshold. Table C-1 below shows the time-weighted estimated distribution of MHS-eligible children (e.g., FTEs) on a state-by-state basis.[18]

[18] This estimate of the distribution of MHS-eligible FTEs is based on the distribution of the farmworker parents of the MHS-eligible children. Thus, it assumes a uniform number of eligible children per eligible household, and that eligible children reside with their parents.

STATE	TOTAL FTEs	% OF TOTAL FTEs
US	82,000	100%
AL	675	0.8%
AZ	1,483	1.8%
AR	1,170	1.4%
CA	24,243	29.6%
CO	840	1.0%
CT	427	0.5%
DE	165	0.2%
FL	6,097	7.4%
GA	1,464	1.8%
ID	1,335	1.6%
IL	1,791	2.2%
IN	980	1.2%
IA	1,029	1.3%
KS	696	0.8%
KY	1,037	1.3%
LA	1,062	1.3%
ME	292	0.4%
MD	397	0.5%
MA	499	0.6%
MI	1,926	2.3%
MN	1,153	1.4%
MS	994	1.2%
MO	955	1.2%
MT	420	0.5%
NE	667	0.8%
NV	87	0.1%
NH	87	0.1%
NJ	806	1.0%
NM	637	0.8%
NY	1,577	1.9%
NC	2,763	3.4%
ND	540	0.7%
OH	1,486	1.8%
OK	504	0.6%
OR	2,566	3.1%
PA	1,992	2.4%
RI	59	0.1%
SC	794	1.0%
SD	249	0.3%
TN	769	0.9%
TX	8,624	10.5%
UT	260	0.3%
VT	53	0.1%
VA	1,066	1.3%
WA	4,388	5.4%
WV	135	0.2%
WI	1,194	1.5%
WY	118	0.1%

Figures may not add due to rounding.

Calculation.

- Because farmworker parents of MHS-eligible households spend, on average, 57% of their time in the United States doing farm work, 57% of the FTE allocation for the 82,000 MHS-eligible children is determined by the total time MHS-eligible parents spend in farm work in each state.
- Because farmworker parents of MHS-eligible households spend, on average, 43% of their time in the United States *not* doing farm work, 43% of the FTE allocation for the 82,000 MHS-eligible children is determined by the total "down time" MHS-eligible parents spend in each state.
- The National Distribution of Migrant Head Start FTEs is the result of the steps outlined below. Table C-2 presents breakdowns for each state. Due to limitations in the data sources, Hawaii, Alaska and the U.S. Territories are excluded from the distribution of MHS FTEs.

Step 1

(Labor expenditures in crop agriculture in state X) / (Average wage in crop agriculture in state X) = (Total agricultural work hours in state X)
In Table C-2, this step is represented as Column B / Column C = Column D.

Step 2

(Total agricultural work hours in state X) * (Percent of state X farmworkers with MHS-eligible children) = (Agricultural work hours worked by farmworkers with MHS-eligible children in state X)

In Table C-2, this step is represented as Column D * Column G = Column H.

Step 3

(Agricultural work hours worked by MHS farmworkers with MHS-eligible children in state X) / (Agricultural work hours worked by farmworkers with MHS-eligible children in state X) = (Percent of total MHS-eligible agricultural work hours worked by state X)

In Table C-2, this step is represented as Column H / Sum of Column H = Column I.

Step 4

(Percent of total MHS-eligible agricultural work hours worked by state X) * (Average percent of time in the U.S. that farmworker parents of MHS-eligible children spend in farm work) = (Percent of total FTEs distributed to state X for its total eligible agricultural work time)

In Table C-2, this step is represented as Column I * (.57) = Column J.

Step 5

(Percent of total U.S. “down time” spent in state X) * (Average percent of time in the U.S. that farmworkers with MHS-eligible children spend not in farm work) = (Percent of total FTEs distributed to state X for its total eligible “down time”)

In Table C-2, this step is represented as Column L * (.43) = Column M.

Step 6

(Percent of total FTEs distributed to state X for its total eligible “down time”) * (82,000) = FTEs distributed to state X for its total eligible “down time”)

In Table C-2, this step is represented as Column M * (82,000) = Column N.

Step 7

(FTEs distributed to state X for its total eligible agricultural work time) + (FTEs distributed to state X for its total eligible “down time”) = (Total FTEs distributed to state X)

In Table C-2, this step is represented as Column K + Column N = Column O.

Where:

- Average percent of time in the U.S. that farmworker parents of MHS-eligible children spend in farm work = Data on work history from NAWS (1992-1995) indicating what percent of U.S.-based time farmworkers with MHS-eligible children spend in farm work.

- Average percent of time in the U.S. that farmworkers with MHS-eligible children spend not in farm work = Data on work history from NAWS (1992-1995) indicating what percent of U.S.-based time farmworkers with MHS-eligible children spend not doing farm work (i.e., is "down time").

- Average wage in crop agriculture in state X = Data on wages for hired workers (excludes contract workers) in crop agriculture from the Farm Labor Survey (1992).

- Labor expenditures in crop agriculture in state X = Labor expenditures for hired and contract workers in crop agriculture (SIC 01) from the Census of Agriculture, 1992.

- Percent of state X farmworkers with MHS-eligible children = Data from the NAWS (1992-1995) on the percent of farmworkers who meet the MHS eligibility criteria described earlier in this appendix. NAWS determines the proportion of farmworkers who have MHS-eligible children in each of the three largest agricultural states (California, Florida and Texas), in the remaining Northern states as a region, and in the remaining Southern states as a region.

- Percent of total U.S. "down time" spent in state X = Data from NAWS (1992-1995) and the Census of Agriculture (1992) on the percent of time not doing farm work, or "down time" farmworkers with MHS-eligible children spend in each state. NAWS determines the percentage of time in each of the three largest agricultural states (California, Florida and Texas), in the North, and in the South.

The allocation of regional “down time” among the states in each region is in proportion to labor expenditures in crop agriculture (see Labor expenditures in crop agriculture in state X, above).

A	B	C	D	E	F	G
	TOTAL CROP LABOR EXP.	FIELD WORKER WAGES	TOTAL AG WORK HOURS	% OF TOTAL AG WORK HRS. BY STATE	REGION (1=NO 2=SO)	% OF FW'S WHO ARE MHS-ELIG.
	COA-'92	USDA -'92	B/C	D/SUM D'S		NAWS(92-95)
US	$9,095,071		1,854,251	100.00%		
AL	$90,744	$5.10	17,793	0.96%	2	5.80%
AZ	$209,686	$5.36	39,121	2.11%	2	5.80%
AR	$156,715	$5.08	30,849	1.66%	2	5.80%
CA	$3,419,292	$6.00	569,882	30.73%	CA	8.50%
CO	$118,222	$5.34	22,139	1.19%	2	5.80%
CT	$60,819	$6.86	8,866	0.48%	1	6.00%
DE	$17,152	$5.01	3,424	0.18%	1	6.00%
FL	$1,190,860	$5.87	202,872	10.94%	FL	5.70%
GA	$188,759	$4.89	38,601	2.08%	2	5.80%
ID	$184,083	$5.23	35,198	1.90%	2	5.80%
IL	$222,249	$5.98	37,165	2.00%	1	6.00%
IN	$127,102	$6.25	20,336	1.10%	1	6.00%
IA	$121,279	$5.68	21,352	1.15%	1	6.00%
KS	$107,068	$5.83	18,365	0.99%	2	5.80%
KY	$129,948	$4.75	27,357	1.48%	2	5.80%
LA	$130,834	$4.67	28,016	1.51%	2	5.80%
ME	$41,536	$6.86	6,055	0.33%	1	6.00%
MD	$56,960	$6.92	8,231	0.44%	1	6.00%
MA	$71,077	$6.86	10,361	0.56%	1	6.00%
MI	$235,853	$5.90	39,975	2.16%	1	6.00%
MN	$148,640	$6.21	23,936	1.29%	1	6.00%
MS	$121,328	$4.63	26,205	1.41%	2	5.80%
MO	$107,459	$5.42	19,826	1.07%	1	6.00%
MT	$47,469	$5.44	8,726	0.47%	1	6.00%
NE	$100,151	$5.69	17,601	0.95%	2	5.80%
NV	$12,408	$5.40	2,298	0.12%	2	5.80%
NH	$12,416	$6.86	1,810	0.10%	1	6.00%
NJ	$112,938	$6.75	16,732	0.90%	1	6.00%
NM	$84,357	$5.02	16,804	0.91%	2	5.80%
NY	$188,465	$5.76	32,720	1.76%	1	6.00%
NC	$278,711	$4.86	57,348	3.09%	1	6.00%
ND	$89,261	$6.27	14,236	0.77%	2	5.80%
OH	$181,921	$5.90	30,834	1.66%	1	6.00%
OK	$68,046	$5.12	13,290	0.72%	2	5.80%
OR	$329,680	$6.19	53,260	2.87%	1	6.00%
PA	$240,596	$5.82	41,340	2.23%	1	6.00%
RI	$8,391	$6.86	1,223	0.07%	1	6.00%
SC	$97,998	$4.68	20,940	1.13%	2	5.80%
SD	$35,721	$5.44	6,566	0.35%	2	5.80%
TN	$107,479	$5.30	20,279	1.09%	2	5.80%
TX	$441,400	$4.80	91,958	4.96%	TX	8.90%
UT	$32,249	$5.98	5,393	0.29%	1	6.00%
VT	$7,560	$6.86	1,102	0.06%	1	6.00%
VA	$112,591	$5.09	22,120	1.19%	1	6.00%
WA	$554,592	$6.09	91,066	4.91%	1	6.00%
WV	$13,329	$4.75	2,806	0.15%	1	6.00%
WI	$132,518	$5.35	24,770	1.34%	1	6.00%
WY	$15,182	$4.89	3,105	0.17%	2	5.80%

ST	H	I	J	K
	AG WORK HOURS BY MHS-ELIG. FARMWORKERS	% OF TOTAL MHS AG WORK HRS. BY STATE	% OF TOTAL FTE'S FROM AG WORK BY STATE	MHS FTE'S FROM AG WORK
	D*G	H/SUM H'S	I*.57	J*82K
US	126,763	100.00%	57.00%	46,740
AL	1,032	0.81%	0.46%	381
AZ	2,269	1.79%	1.02%	837
AR	1,789	1.41%	0.80%	660
CA	48,440	38.21%	21.78%	17,861
CO	1,284	1.01%	0.58%	473
CT	532	0.42%	0.24%	196
DE	205	0.16%	0.09%	76
FL	11,564	9.12%	5.20%	4,264
GA	2,239	1.77%	1.01%	826
ID	2,041	1.61%	0.92%	753
IL	2,230	1.76%	1.00%	822
IN	1,220	0.96%	0.55%	450
IA	1,281	1.01%	0.58%	472
KS	1,065	0.84%	0.48%	393
KY	1,587	1.25%	0.71%	585
LA	1,625	1.28%	0.73%	599
ME	363	0.29%	0.16%	134
MD	494	0.39%	0.22%	182
MA	622	0.49%	0.28%	229
MI	2,399	1.89%	1.08%	884
MN	1,436	1.13%	0.65%	530
MS	1,520	1.20%	0.68%	560
MO	1,190	0.94%	0.53%	439
MT	524	0.41%	0.24%	193
NE	1,021	0.81%	0.46%	376
NV	133	0.11%	0.06%	49
NH	109	0.09%	0.05%	40
NJ	1,004	0.79%	0.45%	370
NM	975	0.77%	0.44%	359
NY	1,963	1.55%	0.88%	724
NC	3,441	2.71%	1.55%	1,269
ND	826	0.65%	0.37%	304
OH	1,850	1.46%	0.83%	682
OK	771	0.61%	0.35%	284
OR	3,196	2.52%	1.44%	1,178
PA	2,480	1.96%	1.12%	915
RI	73	0.06%	0.03%	27
SC	1,215	0.96%	0.55%	448
SD	381	0.30%	0.17%	140
TN	1,176	0.93%	0.53%	434
TX	8,184	6.46%	3.68%	3,018
UT	324	0.26%	0.15%	119
VT	66	0.05%	0.03%	24
VA	1,327	1.05%	0.60%	489
WA	5,464	4.31%	2.46%	2,015
WV	168	0.13%	0.08%	62
WI	1,486	1.17%	0.67%	548
WY	180	0.14%	0.08%	66

A	L	M	N	O	P
	% OF TOTAL NON AG WORK TIME IN U.S. BY STATE	% OF TOTAL FTE'S FROM NON AG WORK TIME BY STATE	MHS NON-AG WORK FTE'S	TOTAL FTE'S	% OF TOTAL FTE'S
	NAWS&COA	L*.43	M*82K	K+N	O/SUM O'S
US	100.00%		35,813	82,000	100%
AL	0.83%	0.36%	294	675	0.8%
AZ	1.83%	0.79%	647	1,483	1.8%
AR	1.45%	0.62%	510	1,170	1.4%
CA	18.10%	7.78%	6,382	24,243	29.6%
CO	1.04%	0.45%	366	840	1.0%
CT	0.66%	0.28%	231	427	0.5%
DE	0.25%	0.11%	89	165	0.2%
FL	5.20%	2.24%	1,834	6,097	7.4%
GA	1.81%	0.78%	638	1,464	1.8%
ID	1.65%	0.71%	582	1,335	1.6%
IL	2.75%	1.18%	969	1,791	2.2%
IN	1.50%	0.65%	530	980	1.2%
IA	1.58%	0.68%	557	1,029	1.3%
KS	0.86%	0.37%	304	696	0.8%
KY	1.28%	0.55%	452	1,037	1.3%
LA	1.31%	0.56%	463	1,062	1.3%
ME	0.45%	0.19%	158	292	0.4%
MD	0.61%	0.26%	215	397	0.5%
MA	0.77%	0.33%	270	499	0.6%
MI	2.95%	1.27%	1,042	1,926	2.3%
MN	1.77%	0.76%	624	1,153	1.4%
MS	1.23%	0.53%	433	994	1.2%
MO	1.47%	0.63%	517	955	1.2%
MT	0.65%	0.28%	227	420	0.5%
NE	0.83%	0.35%	291	667	0.8%
NV	0.11%	0.05%	38	87	0.1%
NH	0.13%	0.06%	47	87	0.1%
NJ	1.24%	0.53%	436	806	1.0%
NM	0.79%	0.34%	278	637	0.8%
NY	2.42%	1.04%	853	1,577	1.9%
NC	4.24%	1.82%	1,495	2,763	3.4%
ND	0.67%	0.29%	235	540	0.7%
OH	2.28%	0.98%	804	1,486	1.8%
OK	0.62%	0.27%	220	504	0.6%
OR	3.94%	1.69%	1,388	2,566	3.1%
PA	3.06%	1.31%	1,077	1,992	2.4%
RI	0.09%	0.04%	32	59	0.1%
SC	0.98%	0.42%	346	794	1.0%
SD	0.31%	0.13%	109	249	0.3%
TN	0.95%	0.41%	335	769	0.9%
TX	15.90%	6.84%	5,606	8,624	10.5%
UT	0.40%	0.17%	141	260	0.3%
VT	0.08%	0.04%	29	53	0.1%
VA	1.64%	0.70%	577	1,066	1.3%
WA	6.73%	2.89%	2,374	4,388	5.4%
WV	0.21%	0.09%	73	135	0.2%
WI	1.83%	0.79%	646	1,194	1.5%
WY	0.15%	0.06%	51	118	0.1%

Columns may not add up due to rounding.

Details on the Sampling Methodology and Accuracy of the Data Sources

This section contains background on the methodology behind each of the data sources used in this appendix for estimating the national distribution of MHS-eligible FTEs and an assessment of their accuracy. Because the methodology to estimate the national total and distribution of MHS-eligible FTEs is multistepped and based on multiple sources, there is no easy way to determine the accuracy of the results. The accuracy of the estimates contained in this appendix, however, is a function of the accuracy of the data sources used to arrive at the estimate. Thus, this section contains background information on sampling methodology and estimates of sampling error for the data sources used. This should allow the reader to estimate the accuracy, or sampling error, for any part of the methodology. Interested readers may refer to the literature on each of the data sources for more details on the sampling and other methodologies.

The U.S. Department of Agriculture Farm Labor Survey (FLS)

The FLS, collected by the National Agricultural Statistics Service (NASS), uses two samples of farm operators in multiple frame sampling. First, NASS maintains a list of farms that hire farmworkers. Farms on this list are classified by size and type. Those expected to employ large numbers of workers are selected with greater frequency than those hiring few or no workers. A second sample consists of segments of land scientifically selected from aerial photography. Each June, highly trained interviewers locate each selected land segment and identify every farm operating within the boundaries of the sample segment. The names of farms found in these area segments are matched against a list of farms. Those not found on the list are included in the labor survey sample to represent all farms not on the NASS list.

Two subsets of FLS data were used in this appendix. The confidence interval that accounts for the relative sampling error for each of these data are contained in Table C-3.

Table C-3
Confidence Intervals of FLS Data Subsets

Data	95% Confidence Interval
FLS data used in estimating the national population of farmworkers (estimation step 1).	+/– 3%
FLS data on average wage by state (estimation step 3, column C in Table C-2).	+/– 7%

The U.S. Department of Commerce Census of Agriculture (COA)

The COA, conducted by the Bureau of the Census, is a mail survey of U.S. farms and ranches that is conducted every five years. The 1992 mailing list was comprised of individuals, businesses, and organizations that could be readily identified as being associated with agriculture. The list was assembled from the records of the 1987 census, administrative records of the Internal Revenue Service, and the statistical records of the U.S. Department of Agriculture. In addition, lists of large specialized operations were obtained from State and Federal agencies, trade associations, and similar associations. Lists of companies having one or more establishments or locations that produce agricultural products were obtained from the 1987 census and updated using the information from the Standard Statistical Establishment List maintained by the Census Bureau. Exhaustive record linkage, unduplication, and mathematical modeling yielded a final mailing list of 3.55 million names and addresses that had a substantial probability of being farm operations. In order to reduce burden, however, some questions, including questions on labor expenditures, were sent to just a subset of the mailing list. After the initial mailing, a thank you/reminder card was mailed to all those on the mailing list. Four follow-up letters were sent to nonrespondents. Telephone calls were made to all large farm operations who had not responded, and to a sample of non-respondents in counties which had response rates of less than 75%. A

non-respondent adjustment was used to represent the final non-respondent farms in the census results.

COA data on expenditures were used in estimation step 3 (columns B and L in Table C-2) of this appendix. In estimating the relative sampling error of the COA figures, we arrive at a 95% confidence interval of +/– 1%.

The U.S. Department of Labor National Agricultural Workers Survey (NAWS)

NAWS sampling procedures are designed to obtain a nationally representative sample of workers. Significant seasonal and regional fluctuations in agricultural employment, unconventional living arrangements and high mobility make many farmworkers hard to find. NAWS uses site area sampling to interview approximately 2,500 randomly selected crop workers each year.

To account for the seasonality of the industry, NAWS conducts interviews three times a year in cycles lasting six to twelve weeks. The cycles start in January, May and September. The number of interviews conducted in each cycle is proportionate to the amount of agricultural activity at that time of the year. NAWS selects workers for each cycle using a multi-stage sampling procedure. The first stage of sampling allocates interviews to 12 distinct agricultural regions which encompass all 48 states in the continental United States. In the summer and fall cycles, all 12 agricultural regions are sampled individually. During the winter cycle, due to sparse farm labor in many areas of the country, there are only six regions: Florida, Texas-Oklahoma, California, Mountain 3, Pacific, and a sixth winter region created by combining the remaining seven regions into one large region called Rest of Country (ROC). For all cycles, the number of interviews per region is proportional to the size of the seasonal farm labor force in that region as determined by NASS using information obtained from the FLS. The next stage of sampling allocates interviews within regions. At the beginning of the survey, a total of 47 crop reporting districts (CRDs) were selected representing the 12 agricultural regions. A minimum of two CRDs were selected in each region. These 47 CRDs

contain 288 counties. For each cycle, a proportionate number of CRDs within each region are randomly selected from the list of 47 CRDs, using probabilities proportional to agricultural payrolls. Interviews are allocated to the selected CRDs proportional to seasonal agricultural payroll.

For each cycle, approximately 30 CRDs are selected. CRDs are randomly selected within each region using probabilities proportional to the seasonal agricultural payroll. The number of CRDs selected in each region is based on the seasonal regional interview allocations. Interviews are allocated to the selected CRDs proportional to their seasonal agricultural payroll as determined from payroll data from the COA and seasonal information from Unemployment Insurance data and other sources. Within each CRD, counties are drawn in a random order using probabilities proportional to seasonal agricultural payroll. Interviewing begins in the first selected county. As a county's work force is exhausted, interviewing moves to the next randomly selected county on the list until all the allocated interviews in that CRD have been completed.

Within each selected county, employers are selected at random using probabilities proportional to their seasonal labor force as determined primarily from data gathered by SESAs and provided to the Bureau of Labor Statistics. The SESA lists have information on 4-digit SIC codes, number of workers, total payroll and weeks worked.

Once employers are selected, NAWS interviewers contact them and secure permission to interview workers and to visit the work site to select workers. Once on site, a sample of workers working that day is selected using random selection techniques. Interviewers talk to the selected workers and set up a time and location for the interview. Workers are interviewed away from the job location so as to minimize the possible influence of the employer on their answers. Workers receive an honorarium to compensate them for any expenses incurred (such as transportation or child care) or any inconvenience caused by the interview.

Because various subsets of NAWS data were used in the estimates on MHS-eligible FTEs contained in this appendix, there are various confidence intervals corresponding to the NAWS. These are listed in Table C-4.

Table C-4
Confidence Intervals of the NAWS Data

Data	95% Confidence Interval
NAWS data used in estimating the national population of farmworkers (estimation step 1).	+/– 3%
NAWS data used in estimating number of farmworkers with MHS-eligible children (estimation step 2).	+/– 3%
NAWS data used in estimating the number of children per MHS-eligible household (estimation step 2).	+/– 4%
NAWS data used in estimating average percent of time in the U.S. that farmworker parents of MHS-eligible children spend in farm work and not in farm work (estimation step 3).	+/– 3%
NAWS data used in determining percent of farmworkers who have MHS-eligible children by region (estimation step 3, column G in Table C-2).	+/– 6%
NAWS data used in determining the percent of "down time" spent in each region (estimation step 3, column L in Table C-2).	+/– 3%