

NIOSH Extramural Award Final Report Summary

Title: Childhood Agricultural Safety and Health Research
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City & State: Davis, CA
Telephone:
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Abstract:

The California Institute for Rural Studies, Inc. conducted a study with three interrelated projects to: (1) conduct a retrospective review of already completed interviews of hired farm workers conducted by the National Agricultural Workers Survey (NAWS) during the eight year period FY 1989-FY 1996; (2) conduct a retrospective review of reports of injury claims by child hired farm workers submitted to the workers Compensation Insurance Rating Bureau of California during the four-year period 1990-94; (3) conduct a field site investigation of a Florida community in which anecdotal evidence has demonstrated that children working as hired farm workers are an important part of the local labor force.

The NAWS identified demographic information on hired farm workers, employment (duration and characteristics), wage rates, earnings and income, workers compensation insurance and employment based health insurance. The survey found that 6.3 percent of hired crop farm workers are children in the age range 14-17, although these figures underestimate the number of children who actually perform work as hired crop farm workers since NAWS excludes children younger than 14. A large share of hired crop farm workers are foreign-born. About three fifths of child hired crop farm workers are US citizens and just under one-third said they were undocumented. This contrasts sharply with the profile of adult crop farm workers, of which only one third are citizens and another one third are work-authorized aliens. However, a large share of child hired crop farm workers are unaccompanied, i.e. they are living and working on their own without supervision by a parent or guardian. Overall 37 of child crop farm workers were unaccompanied. This is significant because these children are less likely to receive adult advice and training to govern behavior. Crops, jobs, and tasks were similar for child hired crop farm workers as compared with adult workers, however few children performed semi skilled tasks such as tractor driver or machine operator or applied pesticides. Hourly earnings of child hired crop farm workers were only about 10% lower than for adults. However, owing to fewer days worked child workers had much lower personal income than adult workers.

The retrospective review of claims data strongly support the conclusion that relatively few children are formally employed on farms in California. Moreover, of those who work as hired farm workers, relatively few experience serious workplace injuries resulting in death or permanent disability. California is one of the few states where child workers are

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required to have a work permit signed by a parent and by school authorities to be eligible for employment. Because of enforcement of this, California is more careful about hiring very young workers than other states. Also, California has a long and continuing history of a large surplus of adult workers as well as proximity to Mexico where many additional adult workers are eager to find jobs in the US. For this reason agricultural employers have most often been able to satisfactorily meet their labor needs by employing adults. Finally, data suggest that child workers in California have much less exposure to more dangerous jobs than is the case for adult workers. Proportionately fewer children are employed in such semiskilled jobs as tractor driver or machine operator. And very few children can be found applying pesticides.

CIRS contracted with Aguirre International to send farm labor researchers to Florida to explore anecdotal evidence regarding that community's awareness of and capacity to address issues raised by the large number of child hired farm workers. The contractor reported an ethnographic community case study of the health risks faced by teenage migrant farmworkers.

Publications

No publications to date.



Memorandum

Date: April 2, 2001

From: Roy M. Fleming, Sc.D., Director, Research Grants Program RMF
Office of Extramural Programs, NIOSH, D30

Subject: Final Report Submitted for Entry into NTIS for Grant 1 R01 CC914371-01.

To: William D. Bennett
Data Systems Team, Information Resources Branch, EID, NIOSH, P03/C18

The attached final report has been received from the principal investigator on the subject NIOSH grant. If this document is forwarded to the National Technical Information Service, please let us know when a document number is known so that we can inform anyone who inquires about this final report.

Any publications that are included with this report are highlighted on the list below.

Attachment

cc: Sherri Diana, EID, P03/C13

List of Publications - *None*

Final Performance Report

National Institute for Occupational Safety and Health
Centers for Disease Control

Grant No. RO1/CCR914371-01
Childhood Agricultural Safety and Health Research

“The Health of Children Hired to Work on U.S. Farms”

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The Health of Children Hired to Work on U.S. Farms

Don Villarejo
California Institute for Rural Studies, Inc.

This report consists of four principle sections, summarizing the four distinct sets of project activities conducted by the California Institute for Rural Studies (CIRS) and its collaborators under the present grant. The four inter-related projects were:

1. Conduct a retrospective review of already completed interviews of hired farm workers conducted by the National Agricultural Workers Survey (NAWS) during the eight year period FY1989-FY1996;
2. Development of a child hired farm worker health survey supplement to the NAWS, to be administered on a pilot basis as part of the on-going NAWS;
3. Conduct a retrospective review of reports of injury claims by child hired farm workers submitted to the Workers Compensation Insurance Rating Bureau of California (WCIRB) during the four-year period 1990-94;
4. Conduct a field site investigation of a Florida community in which anecdotal evidence has demonstrated that children working as hired farm workers are an important part of the local labor force.

Drs. Lee Husting, formerly Project Director with the Occupational Health Branch of the California Department of Health Services, and Edward Kissam, Senior Research Staff with Aguirre International, took lead responsibility, under formal contractual agreements with CIRS, for project activities, #2 and #4, respectively. Dr. Richard Mines, formerly NAWS Director for the U.S. Department of Labor, collaborated with CIRS in project activities #1 and #2, although he was not under a formal contractual agreement.

1. Retrospective Analysis of National Agricultural Workers Survey data

The purpose of this project activity is to examine already-collected data pertaining to children who are formally employed as hired farm workers. The Fair Labor Standards Act (FLSA) provides legal protection for child workers, defined as those under age 18, who are engaged in formal employment in the U.S., and includes provisions pertaining to agriculture. Following FLSA, this study considers only persons under age 18 who are formally employed as hired farm workers.

The National Agricultural Workers Survey (NAWS), sponsored by the U.S. Department of Labor, administered 18,111 interviews of U.S. hired crop farm workers during the eight year period FY1989 – FY1996. Twelve U.S. crop regions, as defined by the U.S. Department of Agriculture, are represented in the sample, as are some twenty-five states within those regions.

A sample of hired crop farm workers is selected for interview using a multi-stage, stratified sampling procedure. The concept is simple: the random selection of an accurate cross-section of hired crop farm workers is functionally equivalent to the random selection of work sites where hired crop farm workers are known to be employed, i.e., farms. For each of the twelve crop regions, individual counties are randomly selected from all of those within it. Crop regions and counties are weighted according to their national share of hired and contract labor

expense as reported by the *Census of Agriculture*, conducted by the Census Bureau of the U.S. Department of Commerce. For each selected county, specific farms are randomly chosen from a stratified list of all commercial crop farms, ranked in size order by a measure of hired farm worker employment. The full procedure of NAWS subject selection is more fully described elsewhere in the literature.

Hired crop farm workers are selected for interview at the work site: every person interviewed was formally employed at a farm site on the day when they were asked to volunteer for an interview. Workers selected in this process are asked for their consent to be interviewed at their place of residence. However, once underway in the home, the interview process begins with a full household enumeration, including a determination of the agricultural employment status of all residents.

To seek to take account, NAWS conducts interviews during several different times of the calendar year. In this manner, it is possible to include individuals who are seasonally employed as hired crop farm workers but who may not work during one or more calendar quarters. During the period FY1989-FY1996, three cycles of interviews were conducted each year: Fall, Winter, Spring. Starting FY1999, NAWS added a fourth cycle of interviews: Summer.

The NAWS protocol excludes any person under the age of 14 even if they are found to be working as a hired farm worker. Hence, all interviews of minors reported herein refer exclusively to persons aged 14-17. NAWS interviewers found a number of children aged 12 and 13 working as hired farm workers in the random subject selection process, but they were excluded from NAWS data set.

CIRS, independently of the present study, was recommended by the U.S. Department of Labor (DoL) to become one of only two U.S. repository sites for NAWS data outside of the agency. Dr. Richard Mines informed CIRS that preliminary approval was granted by the DoL legal office, allowing CIRS to obtain a full set of NAWS data for use in its on-going research, including the present study. NAWS data sets in CIRS' possession for the period FY1989-FY1996 were chosen for retrospective review to characterize children who are formally employed as hired farm workers. Sonya Tafoya, a social science researcher and statistician at the Public Policy Institute of California, who is experienced and knowledgeable about the subject of hired farm workers, was contracted by CIRS to assist with this analysis.

The data analysis conducted by CIRS for the purposes of the present study began with an extensive review of raw frequencies for all NAWS questions relevant to child hired farm workers. In the course of this review, two significant coding errors in the data set were found. One pertained to coding of interview dates, the other to subjects' immigration status. After discussion with NAWS research staff, appropriate corrections were made to the data set.

Since each NAWS interview subject has been selected through a sampling procedure that includes weighting factors, these must be taken into account when determining results. All findings reported herein, except where specifically otherwise noted, have been based on properly weighted computations.

Figures cited in the narrative text that follows are included with the hard copy of this report. The electronic file figures are contained in the Excel file titled "CAI NAWS Data_NIOSH" that accompanies the electronic copy of the report and are numbered correspondingly.

Demographic profile of children formally employed as hired farm workers

Children, defined herein as persons under the age of 18 at the time of the interview, comprised 6.3% of U.S. hired crop farm workers (Figure 1). Substantial regional differences were found in the fraction of hired crop farm workers who were minors. For example, in California, just 2.4% of the state's hired crop farm workers were children. Owing to relatively small absolute number of minors found in many crop regions, it is not possible to report statistically reliable fractions for most crop regions. However, by aggregating data for all crop regions other than California, it was found that minors represented about 7.8% of hired farm workers in all other regions combined, a fraction three times larger than found for California.

Children aged 14-15 comprised 1.2% of U.S. hired crop farm workers, while those aged 16-17 were 5.1% of the total (Figure 2). Again, major regional differences in the age distribution were found. In California, those aged 14-15 comprised 0.2%, and those aged 16-17 were 2.2%, of the state's hired crop farm labor force. This latter finding must be regarded with caution since the sample of California minors aged 14-15 was extremely small.

The NAWS data also suggest that during the period FY1991-FY1996, the national share of the hired crop farm labor force which were minors remained constant. By calculating sub-totals for the three successive two-year intervals, the fraction of all hired farm workers who were children was 7.2%, 6.6% and 7.6%, respectively. Only for the earlier two-year interval FY1989-FY1990 was the fraction significantly smaller, 3.7%.

Males are predominant in the hired crop farm labor force, but females were found to be a slightly larger proportion among children. Females comprised about 23% of adult hired crop farm workers, but were 30% of child workers (Figure 3). The California findings were similar, females were 19% of the adults who worked as hired farm workers, and were 22% of child workers. The California sample of female minors working as hired crop farm workers was too small to establish this difference as statistically valid.

The large preponderance of the foreign-born among hired farm workers is well established: today more than two-thirds of hired crop workers were born outside of the U.S., and the foreign-born share of all hired crop farm workers has grown from 60% of the total in FY1989 to 69% by FY1995. However, the proportion of minors employed as hired crop farm workers who were born outside of the U.S. differs significantly from the share found among adults: just 39% reported that they were foreign-born (Figure 4).

There is an interesting shift in the share of U.S.-born minors working as hired farm workers that occurred during the early 1990s. During the four-year period FY1989-FY1992, a small majority of child hired farm workers were foreign-born. However, beginning in FY1993 and extending through FY1996, a remarkable turnaround has occurred. During the latter four years, less than half of minors employed as hired farm workers reported foreign birth. Thus, during the period when the foreign-born share of all U.S. hired crop farm workers increased, their share among minors actually declined. Even more surprising, virtually all of this growth in the U.S.-born share has been a result of U.S. White minors entering the hired farm labor force. There are now nearly five times as many U.S.-born White minors employed as hired farm workers as there were eight years ago. Little is known about the reasons for this rather sudden entrance of U.S.-born White minors into the hired crop farm labor force.

NAWS asks subjects about the composition of their household. For children working as hired crop farm workers, many of whom are foreign-born, or who migrate to find work, these questions include inquiries about whether their parents or another close relative are accompanying them, or whether they are unaccompanied. Surprisingly, about 37% of all minors working as hired crop farm workers are unaccompanied (Figure 5). In some cases, their parents

have remained in their country of origin while the child worker has traveled alone to the U.S. in search of employment.

The educational attainment profile of child hired crop farm workers differs markedly from that of adult hired crop farm workers. Whereas half of adult workers have less than 7 years of formal education, only one-fifth of child workers have just 1-6 years of schooling (Figures 6 & 7). At the other extreme, half of all minors working as hired crop farm workers have completed at least one year of high school, whereas only one-fourth of adults have done so. It is likely that this finding can be best understood by recalling that three-fifths of child workers were U.S.-born while three-fifths of adult workers were foreign-born, mostly from Mexico and Central America.

About three-fifths of minors working as hired crop farm workers reported that they were U.S. citizens while just under one-third said that they were undocumented (Figure 8). Only a few child workers were work-authorized aliens. Again, this contrasts sharply with adult hired crop farm workers, of whom just one-third were U.S. citizens. Somewhat more than one-third of adult workers were work-authorized aliens, and just over one-fourth were undocumented.

California findings differed sharply from these results. Fully two-thirds of all minors working on the state's crop farms reported that they were undocumented, as compared with just over one-fourth of adults. While most adult crop farm workers in the Golden State said they were work-authorized aliens, only one in seven child workers had INS authorization.

Because these findings regarding the immigration status of hired farm workers represent aggregated data over the eight-year period, a major finding of the NAWs is obscured. The share of hired crop farm workers who reported that they were U.S. citizens has steadily declined throughout the eight years, falling by half, and was down to a 21% by FY1996 (Figure 9). Conversely, the undocumented share has sharply increased to more than 43% by FY1996 (Figure 10).

Employment: duration, characteristics

When asked how many months they had worked on a U.S. farm in the year previous to the year in which they were interviewed, nearly half (48%) of children responded with the number zero (Figure 11). Nearly all of child crop hired farm workers had not previously worked in U.S. agriculture at all. For adults, just 30% said they had not performed farm work in the U.S. in the prior year. Thus, a very much larger fraction of children were first-time hired farm workers than was the case for adults.

Among child workers who were employed on crop farms during the prior year, a majority had worked fewer than four months. But for adults, three-fifth had worked more than six months in the prior year.

Since hired farm work is typically of seasonal duration with employment usually terminated once the job has been completed. Work duration is of great importance to hired farm workers because it largely determines total annual earnings. The greater the number of days of employment achieved in the year, the larger will be an individual's income. While self-reported data on employment history and job duration can be fraught with errors owing to the limitations of a subject's recall ability, nevertheless the NAWs data indicates that minors have many fewer farm work days per year than is the case for adults. Minors who were employed in the prior year reported an average of 148 days of work whereas adults reported an average of 233 days of work (Figure 12). Thus, on average, an adult hired farm worker had 57% more days of farm work

than did a child hired farm worker. Two years prior to the interview, child workers reported an average of 102 days of employment, and adults reported an average of 196 days.

A majority of children who work on crop farms produce fruits or vegetables (Figure 13), although the number reporting field crop production has increased sharply during the last four years and is associated with the rise of U.S.-born White minors in the labor force. With respect to type of job, the typical child reported doing harvest work (Figure 14). However, the number reporting doing semi-skilled tasks increased sharply during the last four years and is also associated with the increased presence of U.S.-born White minors in the hired farm work force.

An important finding relates to children employed as Pesticide Applicators (Figure 15). On a national basis, 0.7% of adults (weighted N=112.4) reported working as a Pesticide Applicator. Among minors, the corresponding figure was nominally 0.1% (weighted N=1.4), and is so small as to be statistically equivalent to zero. In California, no child was found to be working as a Pesticide Applicator while 1.3% of adults (weighted N=57.9) performed that task.

About 22% of child hired crop farm workers were reported to be employed by a farm labor contractor (FLC), and the remaining 78% worked directly for farm operators. Among adults, the fractions are quite similar, 18% and 82%, respectively. In contrast, in California, FLCs are far more important as employers of both minors and adults: more than one-third of minors working on crop farms were hired by FLCs.

Interestingly, among minors working for FLCs, two-fifths were undocumented and just one in seven was a citizen, whereas among minors working directly for farm operators, the opposite was the case: 70% were citizens and just one in five was undocumented (Figures 16 & 17). Thus, the two populations (working for an FLC or working for a farm operator) were found to be quite distinct with respect to immigration status. In California, in contrast, an absolute majority of minors working for FLCs, or working for farm operators, reported that they were undocumented.

The NAWS was not intended to examine occupational health risks in the farm workplace. That is the reason why an occupational health supplement was developed and incorporated in the NAWS beginning in FY1999. However, during the eight-year period under review in the present study, subjects were asked if they paid the farm operator or labor contractor for rides to their job, a practice associated with a large number of serious accidents involving groups of hired crop farm workers. Approximately 17% of adults and 11% of children interviewed in the NAWS said that they did pay their employer, or a designated representative, for rides to the job (Figure 18). Often implicit in these relationships is an understanding that the payment for the ride is a condition of employment: no job will be available for those unwilling to pay the employer for a ride to work.

Wage Rates, Earnings and Income

Average hourly earnings reported by minors employed as hired crop farm workers were found to be about 10% lower than corresponding rates reported by adults (Figure 19). This result was consistently found to be the case for each of the eight years under review in the present study. Surprisingly, average wage rates reported by minors employed in California were lower (\$4.99) than those reported by all U.S. minors (\$5.09), whereas average wage rates for adults employed in California (\$5.65) were essentially no different than for all U.S. adults (\$5.61).

These differences in wage rates between child workers and adult workers likely reflect the greater amount of farm work experience of adults. Additionally, a larger fraction of adult crop farm workers hold semi-skilled or supervisory jobs, which pay higher rates.

Personal earnings during the prior year were reported to be very much lower for child crop farm workers than for adult workers (Figure 20). Whereas adult workers reported an average of \$8,822 in earnings, children reported only \$2,790. Both figures are eight-year averages, expressed in Constant (1996) Dollars using the National Consumer Price Index. Obviously, the very much larger share of first-time hired farm workers among minors accounts for most of this difference, but the smaller number of work days for those children who did secure crop farm employment is also an important factor. The difference in wage rates between child and adult workers reported above is a relatively much smaller factor. For California, the difference in personal income for child and adult workers was much greater: \$2,131 and \$9,135, respectively. These eight-year averages are based on using the California CPI to calculate earnings in Constant (1996) Dollars.

A significant trend was found for both U.S. and California adult hired crop farm workers: a steep decline in real personal income (Constant 1996 Dollars) during the last two years of the eight-year period. For U.S. adults, average annual income declined by 10% from the eight-year average. In California, personal income fell by an even larger fraction, approximately 18% below the eight-year average.

For all U.S. child hired crop farm workers, it is not meaningful to examine the trend of personal earnings over the eight years examined in this study. This is because such a large fraction of child workers were found to be first-time crop workers and income data refer to the year prior to the interview. In addition, the small size of the sample of California child crop farm workers (weighted N=112) precluded possible development of statistically reliable annual personal income data for each of the eight years for that state.

Family income figures, averaged over the eight-year period, were found to be nearly identical for both U.S. and California adult hired crop farm workers: \$12,487 and \$12,612, respectively. As in the case of personal income, family income among these workers showed a significant fall-off in the most-recent two years, falling by 13% in the U.S. as a whole, and by 25% in California.

Workers Compensation Insurance and Employment-Based Health Insurance

When asked if employer-based workers compensation insurance is available to pay for lost income or disabilities that resulted from injuries or illnesses incurred on the job, only 27% of child hired crop farm workers responded affirmatively (Figure 21). This compares with 31% of adults who said that they were protected by their employer's workers compensation insurance.

Surprisingly, just 12% of California child hired crop farm workers said they were covered by workers compensation insurance, while the fraction of adults who believed they had such protection was 32%, essentially the same as all U.S. adult crop workers (Figures 22 & 23). What is especially surprising about this finding is that California law mandates universal coverage for virtually all private sector employees as well as for state and local government employees. It would appear that only about one of every eight child hired crop farm workers are aware that this protection is available to them.

With respect to employment-based health insurance provided to hired crop farm workers, only 7% of children and 9% of adults said that they had such coverage (Figure 24). In

California, the figures were similar, 6% and 12% respectively. What is not clear from the NAWS is whether the employer makes such insurance available and, if it is offered, whether seasonally employed workers are eligible.

Discussion

The present study, based on review of the NAWS data set for FY1989-FY1996, finds that 6.3% of hired crop farm workers are children in the age range 14-17. NAWS does not attempt to determine the number of hired crop farm workers. However, the federal Commission on Agricultural Workers estimated the total to be approximately 1.81 million. If this estimate is accurate, then the number of child hired crop farm workers is about 114,000. NAWS provided an estimate of 128,500 children of ages 14-17 employed as hired crop farm workers to the U.S. General Accounting Office, based on data from FY1993-FY1996.

These figures surely underestimate the number of children who actually perform work as hired crop farm workers. First, NAWS excludes children younger than 14, even if they are formally employed. NAWS interviewers reported finding 33 children aged 13 during the eight-year period covered by the present study, and these workers were excluded from consideration by the survey protocol. Since no effort was made by NAWS to formally include these very young workers in the data set, it is not possible to estimate their share of the work force.

Second, the work of children who are de facto "employees," even if they do not appear on payroll records, is also excluded. The NAWS protocol limits potential subjects to persons whose names appear on payroll records on the date when interviewers contact the employer. It is well established that some child workers, who are not on the payroll, regularly assist adults, either parents or siblings, in performing crop harvest tasks that are paid on a piece-rate basis. That is, for a crop harvested in a manner that employers find is best accomplished by paying workers on a volume basis, as opposed to an hourly rate of pay or salary, a family member who does appear on the formal payroll may be assisted by other family members. Most often, it is children who provide this assistance, and they usually do not appear on payroll records. The family gains income from this informal assistance, but the child never appears on payroll records. To illustrate, in the California apricot harvest, workers are paid by the bin, receiving a flat amount for each large wooden bin they fill. Children, some as young as eight, have been reported assisting their parents fill the bins. As in the prior instance, no estimate of the number of such workers is possible.

Though not working, some children of hired farm workers are placed at risk of workplace injury or illness when their parents take them to crop fields in lieu of having them in a child care setting. Once again, the number of children in these settings has not been estimated.

About half of child hired crop farm workers had not been employed in farm work in the year prior to their interview. This means that a large share of these children have little or no experience performing agricultural tasks.

Child crop farm workers report a much lower number of months or days of work as compared with adults. Exact estimates are difficult, but the NAWS data indicates that child crop farm workers who had worked at least one farm job in the prior year were employed between half and two-thirds as much time as were adults.

The fact that child hired crop farm workers have less total employment means that while their share in the labor force may be 6.3%, their share of work performed, and their total hours of associated occupational risk, is significantly less. Using their self-reported estimates of days and

months worked, it is likely that child hired crop farm workers, aged 14-17, account for 3.2% to 4.2% of total U.S. hired crop farm employment (work-hours basis).

A large regional variance was found in the share of children working as hired crop farm workers. In California, just 2.4% of crop farm workers are children of ages 14-17. In all other states the average children's share of the hired crop worker labor force is more than three times larger, 7.8%. Again, taking account of the much lower number of months or days worked by California child hired crop farm workers as compared with adults, leads to the conclusion that those, aged 14-17, account for 0.5% to 1.5% of total California hired crop farm employment.

Females comprised 30% of child crop farm workers, but in California their share was smaller, about 22%. In both instances, the share of female workers is smaller among adult hired crop farm workers.

Foreign-born individuals comprise 69% of all U.S. hired crop farm workers, but among children in this labor force, just 39% were foreign-born. Surprisingly, while the foreign-born share of hired crop farm workers has steadily increased during the eight-year period under review, among child workers, the trend has been opposite.

A large share of hired crop farm workers are foreign-born. Hence, knowledge of their immigration status is quite important since it may affect their risk of on-the-job injury or illness. About three-fifths of child hired crop farm workers are U.S. citizens and just under one-third said they were undocumented. Again, this contrasts sharply with the profile of adult crop farm workers, only one-third of which are citizens and another one-third are work-authorized aliens.

A disturbingly large share of child hired crop farm workers are unaccompanied, i.e., they are living and working on their own, without supervision by a parent or guardian. Overall, 37% of child crop farm workers were unaccompanied. This finding has considerable significance for occupational health specialists because these children are less likely to receive adult advice and training to govern their behavior. Some, free of adult restrictions, may also engage in high risk behaviors off-the-job.

Of special interest to occupational health educators is the educational attainment of hired crop farm workers. Unlike adult workers, whose low level of educational attainment corresponds to a very high incidence of functional illiteracy, child workers have surprisingly high levels of schooling. Nearly one-half of adults crop farm workers have less than seven years of formal education. Among child workers, only one-fifth have this limited amount of education. And half of all child workers have completed at least one year of high school.

Roughly one-fifth of child hired crop farm workers are hired by farm labor contractors, roughly comparable to the figure among adults. In California, the figure is much higher: one-third work for a labor contractor. Of those working for a labor contractor, two-fifths said they were undocumented, and just one-seventh were U.S. citizens. But of children who work for farm operators, more than two-thirds are U.S. citizens. When asked if their employer (farm operator or labor contractor) asks them to pay for a ride to the job, 11% of child workers said they paid for the ride.

Crops, jobs and tasks were quite similar for child hired crop farm workers as compared with adult workers. Most worked in fruit or vegetable crops, and harvest work accounted for a plurality of tasks. However, very few children performed semi-skilled tasks, such as tractor driver or machine operator, or applied pesticides.

Hourly earnings of child hired crop farm workers were only about 10% lower than for adults. However, owing to many fewer days or months worked, child workers had much lower personal income than adult workers, by roughly a factor of three.

About one in fifteen child hired crop farm workers reported that they had employment-based health insurance, but roughly one-fourth reported coverage by workers compensation insurance at their place of work. Surprisingly, in California, only one child worker out of eight reported that they had workers compensation insurance protection, in spite of the fact that California law requires virtually all private sector employers to provide such coverage.

2. Development of Child Hired Farm Worker Interview Instrument as a Supplement to the On-going National Agricultural Workers Survey.

During the period October 1997-April 1998, Dr. Lee Husting, formerly Project Director for the Occupational Health Branch of the California Department of Health Services, led the CIRS effort to develop a Child Hired Farm Worker Supplement to the NAWS. As an independent contractor to CIRS, Dr. Husting took principal responsibility for the writing of this instrument, but received substantial cooperation and input from Drs. Richard Mines (formerly U.S. Department of Labor), Edward Kissam (Aguirre International) and Don Villarejo (CIRS). A number of group meetings were held in the San Francisco Bay area (convenient for Husting and Kissam) for which Dr. Mines traveled, at his own expense, from Washington, DC, to attend.

From the outset, Dr. Mines made it clear that the health supplement would be added to the NAWS protocol only for child hired crop farm workers identified in the normal course of interviews. In other words, DoL would continue to conduct the NAWS interviews, but would add the health supplement to any household where a child hired crop farm worker was found. The health supplement would be primarily administered to the child, with the permission of and in the company of a parent or guardian. In the relatively few cases where NAWS selected an adult for interview but a child hired crop farm worker was identified in the same household, the child would also be interviewed with both the primary survey instrument as well as with the health supplement.

Dr. Mines estimated that about 150 child hired crop farm workers would be found in the course of one fiscal year of NAWS interviews. On this basis, it was concluded that the current project would be a pilot survey to determine the feasibility of this method for obtaining information about the occupational health status of child hired crop farm workers.

Dr. Husting completed a draft of the health supplement in late February 1998, and submitted it to Drs. Kissam, Mines and Villarejo for review. Based on comments received from all parties, a revised draft was completed and forwarded to Dr. Villarejo in mid-April 1998. A hard copy of this instrument is attached to the hard copy of this report. An electronic copy in .txt format, titled "CIRS SURVEY INSTRUMENT Revision 1" is included with the electronic copy of this report.

Independently of the CIRS initiative, Dr. Mines was contacted in early 1998 by two NIOSH staff scientists who proposed that NIOSH supplement NAWS funding to conduct a full occupational health supplement to the NAWS. Dr. Baron was referred to Dr. Mines by Dr. Villarejo for this purpose during late 1997. Dr. Meyer evidently acted independently. At a meeting with Dr. Mines in Washington, DC, on March 23, 1998, Dr. Villarejo agreed to cooperate with the NIOSH investigators, and to provide funding from the CIRS NIOSH grant for a portion of the total project cost. The CIRS NIOSH grant had budgeted funds for approximately 150 health supplement interviews. Dr. Mines agreed to provide CIRS with the preliminary health supplement data from NAWS interviews with child workers, but also made it clear that since NIOSH scientists were providing the bulk of the funding, they should get "first crack" at

the data. At that time, Dr. Mines also indicated that NIOSH and DoL had entered into an inter-agency agreement, under which NIOSH human subjects review would be handled by the NIOSH scientists.

Dr. Villarejo provided Dr. Mines with a copy of the revised CIRS health supplement, with the understanding that it would be shared with the NIOSH scientists. Dr. Mines indicated that the final instrument would be worked out with the cooperation of all parties.

Dr. Mines asked Dr. Villarejo to assist in preparing a package of NAWS documents, including the occupational health supplement, for submission to the Office of Management and Budget (OMB), a requirement for all human subject survey research. Dr. Villarejo completed his contribution to the OMB package during late March and Dr. Mines submitted it during April 1998. The OMB package included a substantially revised occupational health component for the NAWS, as developed by the NIOSH scientists.

Since review of the OMB package was expected to require up to six months, the NAWS health supplement interviews would not begin until October 1998, CIRS decided that it would be prudent to request an extension of the CIRS NIOSH grant. During late summer 1998, Dr. Mines informed Dr. Villarejo that OMB approval had been obtained and that NAWS interviews with the health supplement would begin in October. Later in the summer, Drs. Mines and Baron visited Davis and met with Dr. Villarejo. At Dr. Villarejo's initiative, CIRS staff Research Associate Daniel Williams accompanied Drs. Mines and Baron to conduct a small number of pilot NAWS interviews, including the health supplement, in the Salinas Valley of California. At that time both Dr. Mines and Dr. Baron affirmed CIRS participation in the joint project.

During Spring 1999 Dr. Villarejo contacted Dr. Mines concerning the timing for CIRS access to the occupational health supplement data for child hired farm workers gathered by the revised NAWS. Dr. Mines indicated that the data would be available after it had been coded, entered and cleaned, possibly by mid-summer 1999.

Dr. Mines left the U.S. Department of Labor during summer 1999, and is presently conducting research in Mexico under a grant to CIRS from the California Endowment. He is also a Fulbright Fellow, and is Senior Research Associate at CIRS. At the time of his resignation from DoL, Dr. Mines directly stated to Dr. Villarejo that the NAWS data would be provided to CIRS in a timely fashion, i.e., in sufficient time to allow analysis and write-up for the purposes of fulfilling the terms of the CIRS NIOSH grant.

At this writing, CIRS has not received the data that had been promised. For this reason, CIRS has not obligated any of the CIRS NIOSH grant funding that had been budgeted for this purpose. It is the position of CIRS that DoL-NIOSH scientists have not met their obligation in this regard.

3. Retrospective Review of Paid Claims Under Workers Compensation in California by Child Hired Farm Workers for the Period 1990-94.

Description of the WCIRB Data File: Data Review and Cleaning

CIRS requested the Workers Compensation Insurance Rating Bureau of California (WCIRB) to provide all individual records of paid claims under workers compensation for the period 1990-94. Following a lengthy process of negotiation, WCIRB agreed to provide CIRS with its ICR Data File for a limited body of data.

The specific ICR data items requested by CIRS were:

- 7 c Standard Classification Code
- 7 f Number of Claims, This Incident
- 7 g Date of Accident
- 7 j Type of Injury
- 7 l Incurred Indemnity Amount
- 7 m Incurred Medical Amount
- 7 p Injured Worker's Date of Birth
- 7 q Date of Hire
- 7 r Employment Status
- 7 u Injury and Accident Description (Nature of Accident, Nature of Injury, etc.)

The data provided by WCIRB included only some of these data elements, and only those individual records for paid claims that corresponded to incurred losses of \$5,000 or more. In addition, because the CIRS NIOSH grant was intended to support study of child hired farm workers, WCIRB provided specific loss data for only teenage agricultural employees, although records without loss data would be provided for all other workers.

The specific data elements provided by WCIRB consisted of the following:

- 7 c Standard Classification Code
- 7 g Date of Accident
- 7 j Type of Injury
- 7 l Incurred Indemnity Amount (only for teenage agricultural workers)
- 7 m Incurred Medical Amount (only for teenage agricultural workers)
- 7 p Injured Worker's Date of Birth

The Type of Injury coding consists of seven categories:

- 1 = Death
- 2 = Permanent total disability
- 3 = Permanent major disability
- 4 = Permanent minor disability
- 5 = Temporary disability
- 6 = Medical only claim
- 8 = Death, contested regarding whether covered by workers compensation insurance

The 14 specific Standard Classification Codes pertaining to farm employment have been described elsewhere, as has an analysis of injury incidence rates based on WCIRB data.

The ICR data file received by CIRS consisted of 528,679 individual case records. Linda Thorpe, President, D-M Information Systems, was contracted by CIRS to assist in data cleaning and analysis. Careful review of the data disclosed that for the years 1992-94, nearly all deaths and injuries corresponding to permanent disabilities (Type of Injury = 1-4) were included. That is, comparison of the ICR data file with published summaries from the California Department of Industrial Relations showed that the tape file provided by WCIRB to CIRS included 99.2%, 95.1% and 99.2%, respectively, for each of these three year, of all such cases of these types of

injuries. For 1990 and 1991, however, the tape file included 48.3% and 63.4% of all such cases, respectively.

When the cases corresponding to the 14 agricultural classification codes and to deaths or permanent disabilities (Type of Injury = 1-4) were examined for the years 1992-94, it was found that the ICR tape file provided to CIRS contained 78%, 92%, and 100% of all such cases, respectively. For 1991, 64% of these types of agricultural cases were in the ICR tape file, whereas for 1990, less than half of such agricultural cases were included.

The fact that a large share of case records for 1990 and 1991 were clearly missing from the ICR data tape file provided to CIRS by WCIRB was a cause for some concern. WCIRB staff member Karen Yifru was contacted by CIRS and an explanation was requested. Unfortunately, Ms. Yifru was not able to provide an explanation of the omission.

After careful review it was decided to exclude 1990 data entirely from the present study because less than half of all eligible records were included in the ICR tape file. On the other hand, since a higher fraction of 1991 records were included, it was decided to incorporate them in this study. Obviously, the 1992-94 records were very nearly complete and so there was no question regarding their inclusion.

Based on this procedure, a total of 360,782 case records corresponding to injury types 1-4 for the period 1991-94 were available for analysis. These included 16,684 agricultural case records. All further discussion in this report consists of analysis of cases corresponding to Type of Injury = 1-4 (death or permanent disability).

A second review consisted of examination of the case records for injury types 1-4 in the ICR tape file for possible erroneous entries or missing data items. It was found that birth dates were missing for 630 records for the 1991-94 data set, representing 0.17% of the total. For agricultural cases, it was found that only 6 records had missing birth dates, or 0.04% of that sub-total.

Possible erroneous birth dates were more difficult to identify. Ages of claimants on the date of the injury were calculated using the birth date and accident date information for each record. It was found that a small number of records had obviously incorrect birth dates because the calculated ages corresponded to an employed claimant being less than one year old at the time of the injury. Careful review also showed a large gap in calculated ages at age 11 and younger. That is, for a small number of records in the file, calculated ages were typically less than six year, and there were no records at all for ages 7 through 11. It was concluded that records with a claimant age under 12 were likely to be erroneous, probably a result of data entry mistakes. The total number of such erroneous records was 416, or 0.12% of the total. For agricultural cases, there were no such erroneous records found in the file.

It is possible that other case records have erroneous birth dates, but no practical procedure was available to identify these. Given the relatively small share of obviously erroneous birth dates and of missing birth dates in the file, it was decided to proceed with the analysis without further efforts to clean and correct the file.

When other data elements in the file were reviewed, it was found that the file was quite complete and that no obvious errors were apparent. For example, all of the Standard Classification Code data elements corresponded to codes in current use by WCIRB. Similarly, Date of Injury data elements corresponded to reasonable dates. Finally, the financial data provided regarding Indemnity Costs and Medical Costs were also within the range expected. For example, 1994 normal death indemnity benefits were reported as \$120,000 per case, as required by California Workers Compensation statutes.

Summaries of the data described below are contained in the Excel file titled “CAI WCRIB Data_NIOSH” that is a part of the electronic file of this report. Two figures (Figure 25 & Figure 26) can also be found in that file and are also included with the hard copy of this report.

Child Hired Farm Workers, 1991-94, Deaths and Permanent Disability Paid Claims

There were just 56 paid claims under workers compensation to children (ages less than 18 years) for deaths or permanent disabilities in the 14 classification codes corresponding to hired farm work. This represents 0.34% of all paid claims for these types of injuries among hired agricultural workers in California.

One of the 56 cases involved an occupational fatality, none was for permanent total disability, three were for major permanent disability, and the remaining 52 cases were for minor permanent disability. They represent 0.71% of all agricultural worker occupational fatalities, 0% of agricultural worker permanent total disabilities, 0.07% of agricultural worker major permanent disabilities, and 0.42% of agricultural worker minor disabilities.

Among all classification codes, there were 1,190 paid claims involving child workers. Thus, the 56 cases of paid claims to child hired farm workers represented 4.71% of all deaths or permanent disabilities among child workers. For adult workers, paid claims for death or permanent disability to hired farm workers amounted to 4.64% of all paid claims, virtually identical to the figure found for child hired farm workers.

The average amounts paid for indemnity costs per case for child hired farm workers can be meaningfully calculated only for minor permanent disability. This is because there are so few cases of death (1), permanent total disability (0), and major permanent disability (3) among children. For minor permanent disability, the average indemnity loss amounted to \$7,657 per case of a child hired farm worker. This can be compared with an average indemnity loss of \$10,450 per case among all hired farm workers. Thus, the average indemnity loss per child hired farm worker was about 73% of the average loss for all hired farm workers.

The average amount of loss for medical costs per case of minor permanent disability among child hired farm workers was \$8,803. This is only slightly smaller than the medical costs per case of minor permanent disability among all hired farm workers, \$8,962. The difference is so small (less than 2%) that it is within the statistical standard error of the cost per case among child workers.

The distribution of child hired farm worker cases among the 14 classification codes yields numbers of cases that are too small for meaningful analysis. Only in one code, 0172 (Truck Farms), were there more than one-fifth of the 56 cases.

Teenage Hired Farm Workers, 1991-94, Deaths and Permanent Disability Paid Claims

There were 301 paid claims for death or permanent disability among teenage hired farm workers in the 14 classification codes corresponding to hired farm work. This represents 1.80% of all paid claims for these types of injuries among hired agricultural workers in California.

Three of the 301 cases involved an occupational fatality, two were for permanent total disability, 29 were for major permanent disability, and the remaining 267 cases were for minor permanent disability. They represent 2.1% of all agricultural worker occupational fatalities, 5.9% of agricultural worker permanent total disabilities, 0.7% of agricultural worker major permanent disabilities, and 2.2% of agricultural worker minor disabilities.

The average amounts paid for indemnity costs per case for teenage hired farm workers can be meaningfully calculated only for major and minor permanent disability. This is because there are so few cases of death (3) and for permanent total disability (2) among teenagers. For major permanent disability, the average indemnity loss amounted to \$39,239 per case of a teenage hired farm worker, very nearly identical to the figure of \$40,212 found for all hired farm workers (Figure 25). For minor permanent disability, the average indemnity loss incurred for teenage hired farm workers was \$8,086, while for all workers it was \$10,450. Teenage hired farm workers incurred an indemnity loss that was 77% of the amount incurred among all hired farm workers.

The average amount paid for medical costs per case of major permanent disability among teenage hired farm workers was \$50,227 (Figure 26). This is nearly twice the amount of medical costs per case of major permanent disability among all hired farm workers, \$25,992. For minor permanent disability, the average medical loss incurred for teenage hired farm workers was \$8,476, while for all workers it was very nearly the same, \$8,962.

The distribution of teenage hired farm worker death and permanent disability cases among the 14 classification codes finds more than half the cases in just three codes, 80 in the code 0172 (Truck Farms), 52 in the code 0040 (Vineyards) and 38 in the code 0036 (Dairy). In all three codes, teenage hired farm workers had more deaths and permanent disability paid claims than their proportionate share among all hired farm workers.

Discussion

Case report data for paid claims under workers compensation, supplied by the Workers Compensation Insurance Rating Bureau, provides a workable and useful body of information about workplace injuries sustained by hired farm workers. However, the ICR data tape file for 1990 is inadequate in that fewer than half of all claims for death or permanent disability are in the file. For 1991, nearly two-thirds of such cases are in the file. Only for the years 1992-94 is a cumulative total of 98% of all such cases contained in the file.

With respect to the 14 Standard Classification Codes pertaining to hired farm work, again 1990 data was deemed to be inadequate, 1991 data was marginally acceptable, and 1992-94 data was satisfactory. However, only for 1993-94 was a cumulative total of more than 96% of agricultural cases found to be represented in the ICR data file.

Review of the individual data elements in the file showed evidence of a rather high degree of reliability of the data. Only a very few instances were found of obvious data entry errors or missing data elements.

Children working as hired farm workers experienced a very small share of cases of paid claims under workers compensation for death or permanent disability. Just 0.34% of paid claims to hired farm workers were for such cases of child injury. This can be compared with the 2.4% share that children represent of the hired farm labor force of California that was found reviewing NAWS data. Even when the fact that children have very much lower total work hours per year than adults, amounting to a 0.5% to 1.5% estimated share of hired farm work employment in California, their share of deaths or permanent disabilities is substantially lower than their share of total workplace exposure.

When data on all employed children are examined, it is found that child hired farm workers are no more likely to sustain serious injuries than are adults who are employed in agriculture. Among all child workers, those working as hired farm workers comprised 4.7% of

all claims of loss for death or permanent disability. This is essentially the same share that hired farm worker claims of this type comprise as compared with all workers in all industries, namely, 4.6%.

The data on the average amount of paid claims supports the conclusion that child hired farm workers in California experience somewhat less severe injuries than is the case for other workers. The average indemnity loss for major permanent disability claims among child hired farm workers amounted to 73% of the loss in similar cases for all hired farm workers. On the other hand, medical costs for children employed as hired farm workers were very nearly the same as for all hired farm workers.

Teenage hired farm workers (age less than 20 at the time of injury) comprised 1.8% of all paid claims for death or permanent disability. While older teenage hired farm workers experienced similar indemnity costs per case for both major and minor permanent disabilities as compared with all workers, they fared less well than did children in cases of major permanent disability. When data on medical costs per case are examined for teenage hired farm workers, it was found that medical costs per case of major permanent disability were about twice the amount experienced by all hired farm workers in similar cases.

Conclusions

Both the NAWS and WCIRB data strongly support the conclusion that relatively few children are formally employed on farms in California. Moreover, of those who work as hired farm workers, relatively few experience serious workplace injuries resulting in death or permanent disability.

An important factor in this situation is that California is one of the few states where child workers are required to have a work permit signed by a parent and be school authorities to be eligible for employment. This requirement is regularly enforced by the Department of Labor Standards Enforcement of the California Department of Industrial Relations. For this reason, California employers tend to be somewhat more careful about hiring very young workers than is the case in most other states.

In addition, in the agriculture sector, California has a long and continuing history of a large surplus of available adult workers, as well as proximity to Mexico, where many additional adult workers are eager to find jobs in the U.S. For this reason, agricultural employers have most often been able to satisfactorily meet their labor needs by employing adults.

Finally, the available data from both the NAWS and WCIRB suggest that child workers in California have much less exposure to the more dangerous jobs than is the case for adult workers. Proportionately fewer children are employed in such semi-skilled jobs as tractor driver or machine operator. And very few children can found applying pesticides.

4. Conduct a field site investigation of a Florida community in which anecdotal evidence has demonstrated that children working as hired farm workers are an important part of the local labor force.

CIRS contracted with Aguirre International to send several experienced farm labor researchers to Immokalee, Florida, in early 1998 to explore anecdotal evidence regarding that community's awareness of and capacity to address issues raised by the large number of child hired farm workers in the community. Attached is the report prepared by the Aguirre team, titled

“Work-Related Injuries, Illnesses, and Health Risks Faced by Teenage Farmworkers in Immokalee, Florida” by Ed Kissam, Anna Garcia, and Rafael Alarcon. Both hard copy and electronic copies are provided. The file name of the electronic copy is “Kissam Report_Florida.”

FIG. 1

Minors, Hired Farm Workers, by Region, FY1989-FY1996, NAWS

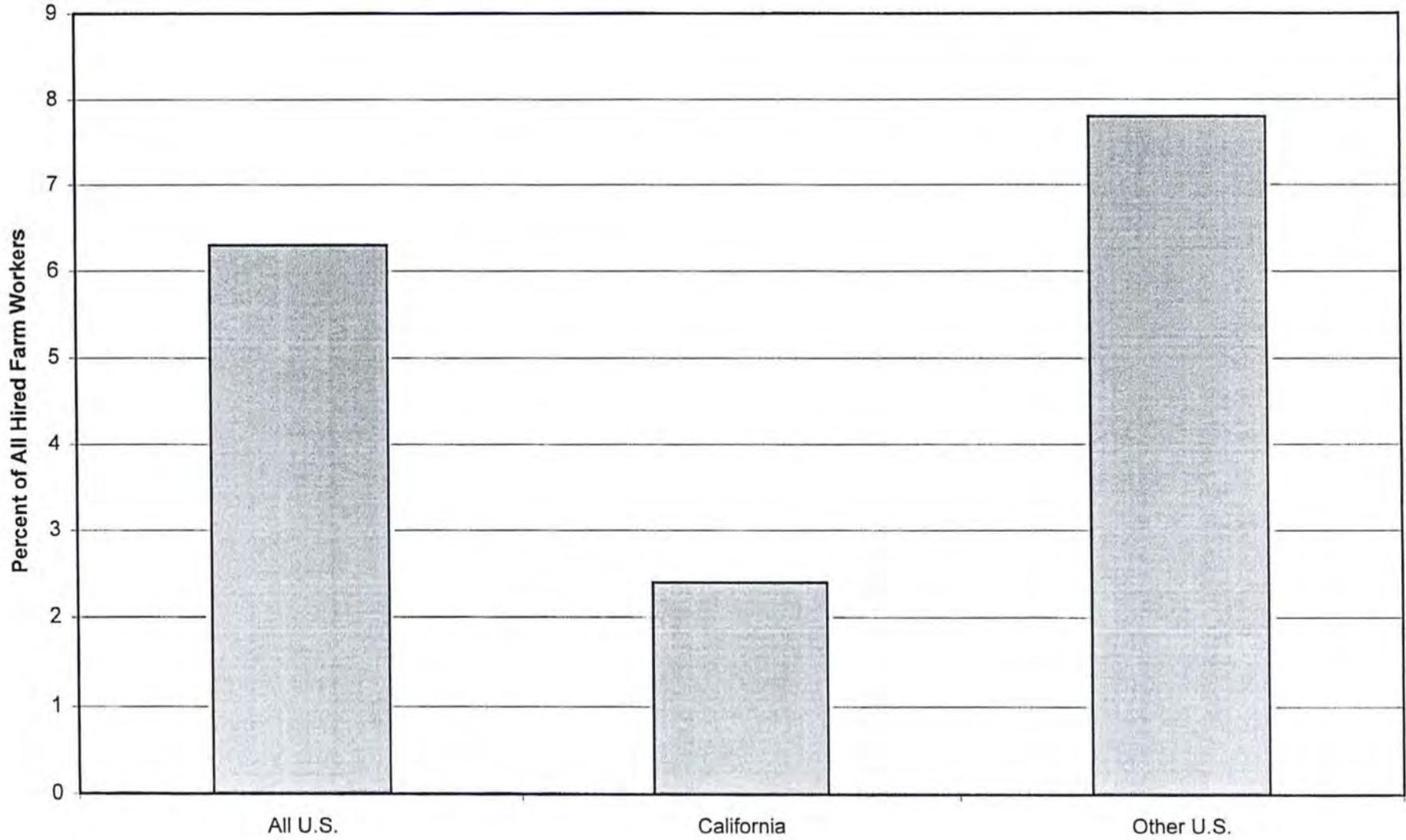


FIG. 2

Minors, by Age and Region, FY1989-Fy1996, NAWS

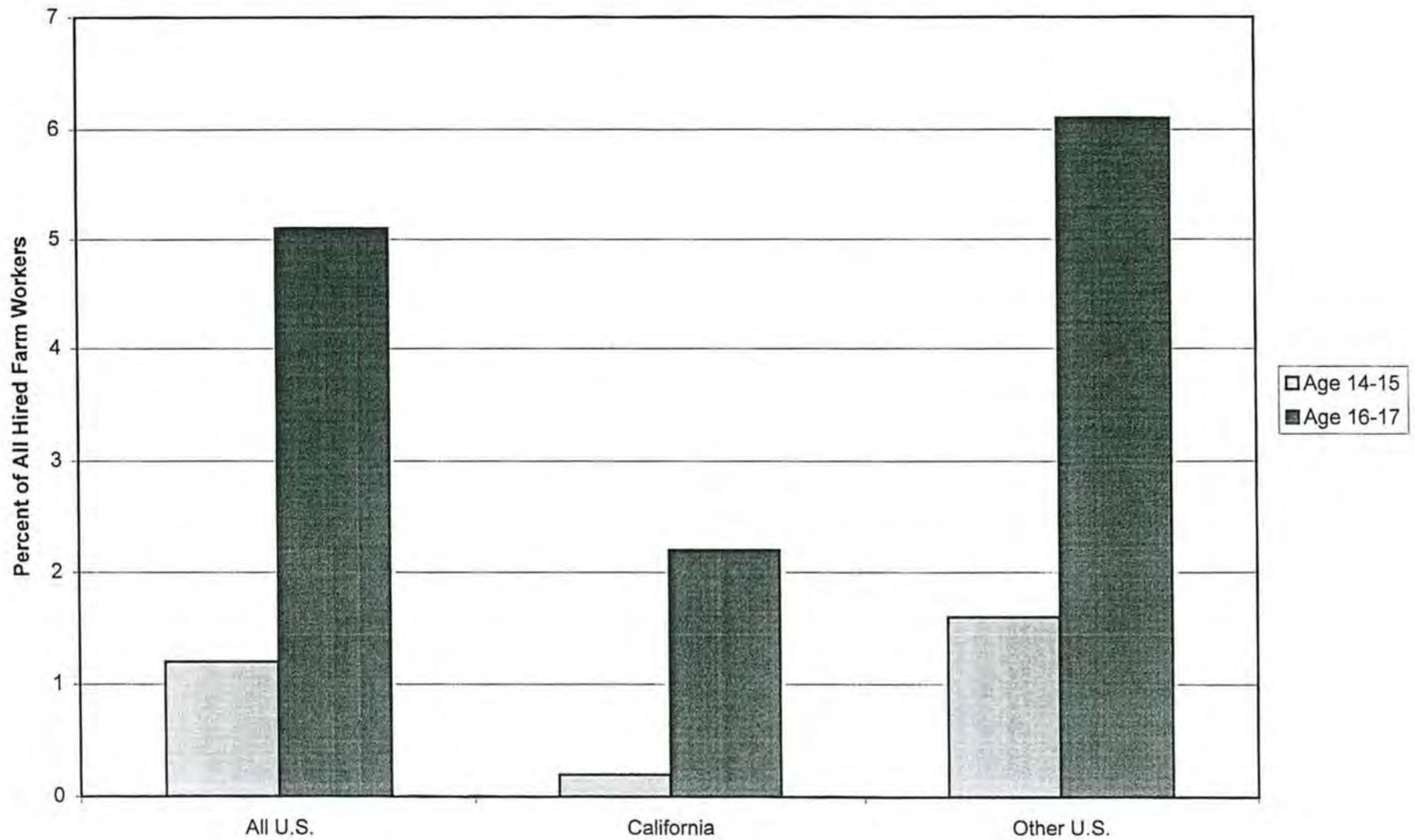


FIG. 3

Minors, Hired Farm Workers, by Gender, FY1989-FY1996, NAWS, U.S.

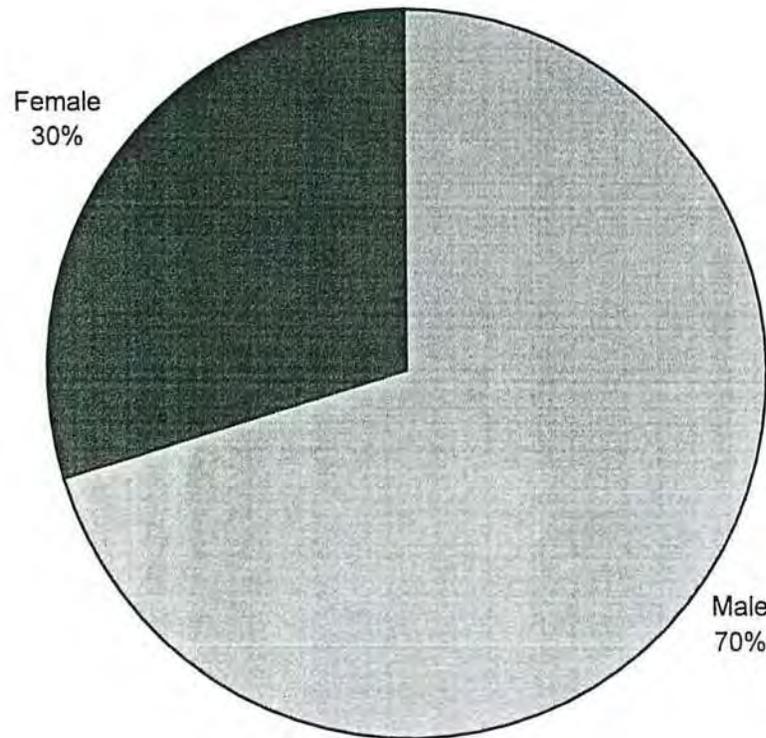


FIG. 4

Minors, Hired Farm Workers, Place of Birth, FY1989-FY1996, NAWS, U.S.

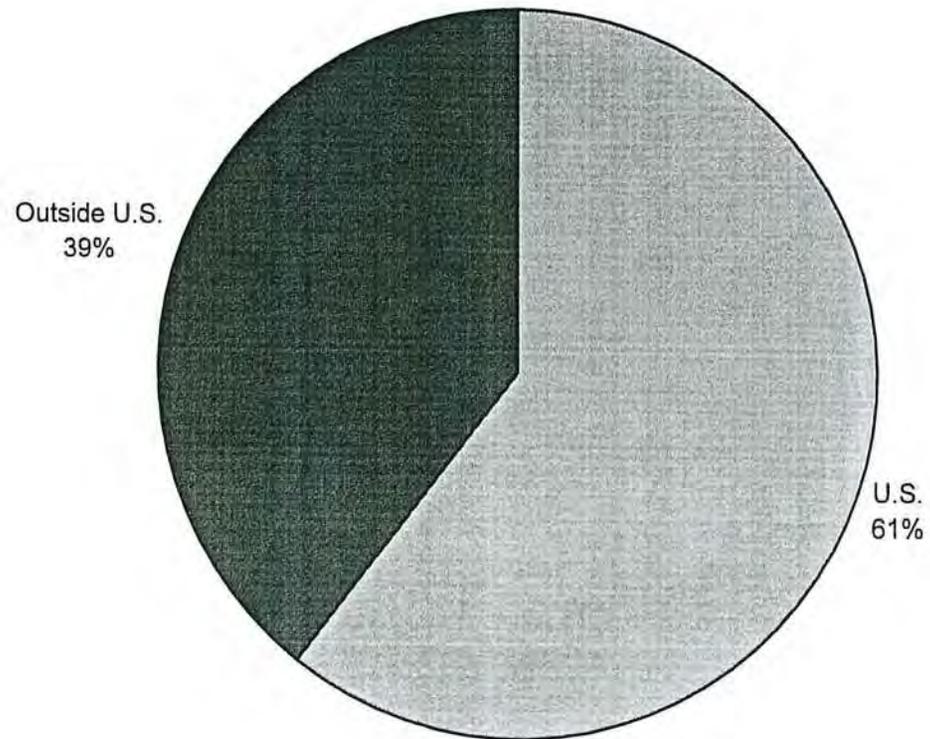


FIG. 5

Minors, Accompanied by Parent or Close Relative, FY1989-FY1996, NAWS, U.S.

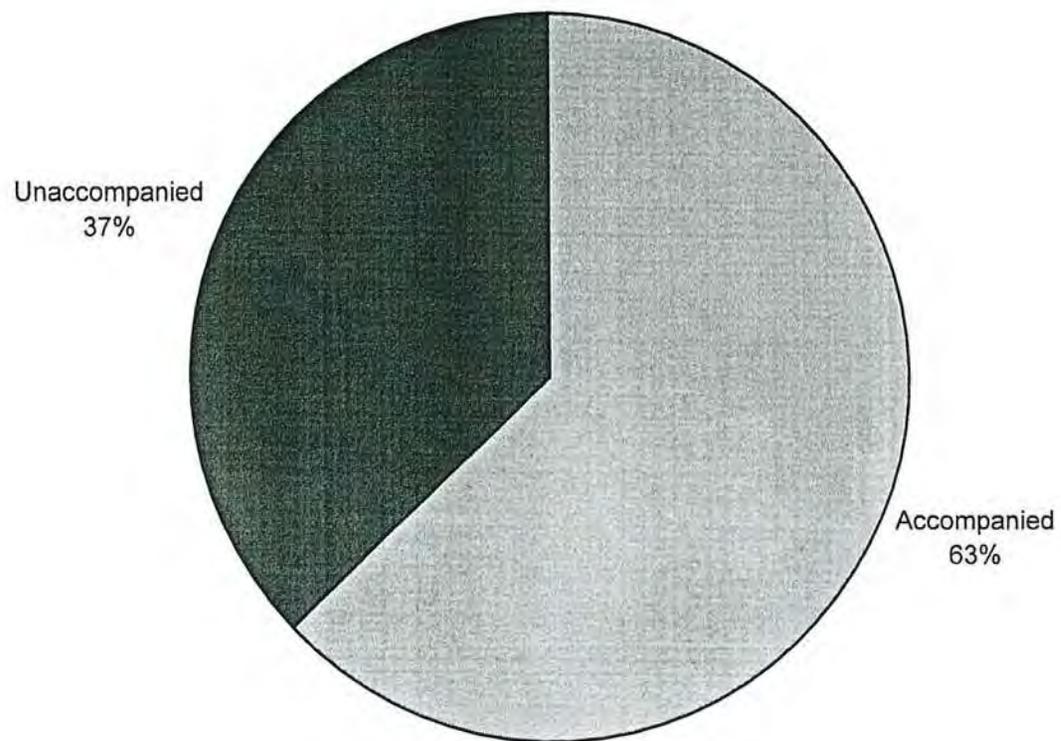


FIG. 6

Adults, Hired Farm Workers, by Educational Attainment, FY1989-FY1996, NAWS, U.S.

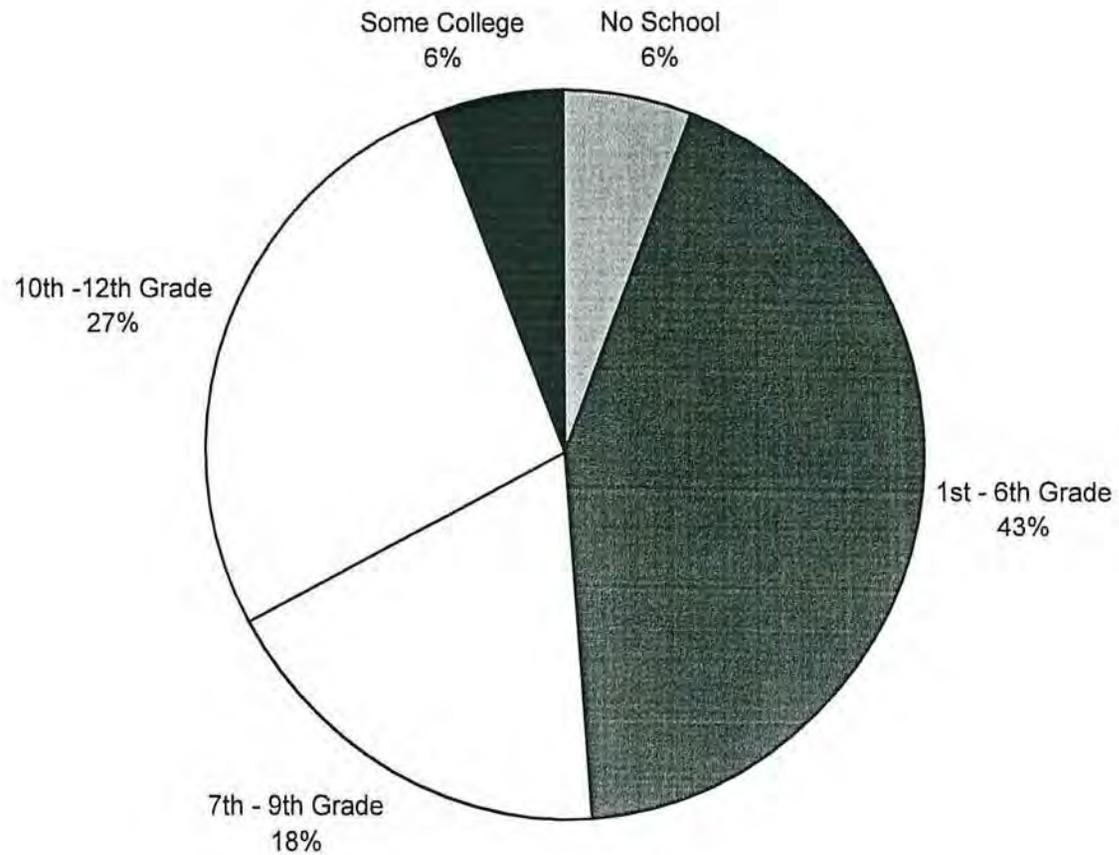


Fig 7

Minors, Hired Farm Workers, by Educational Attainment, FY1989-FY1996, NAWS, U.S.

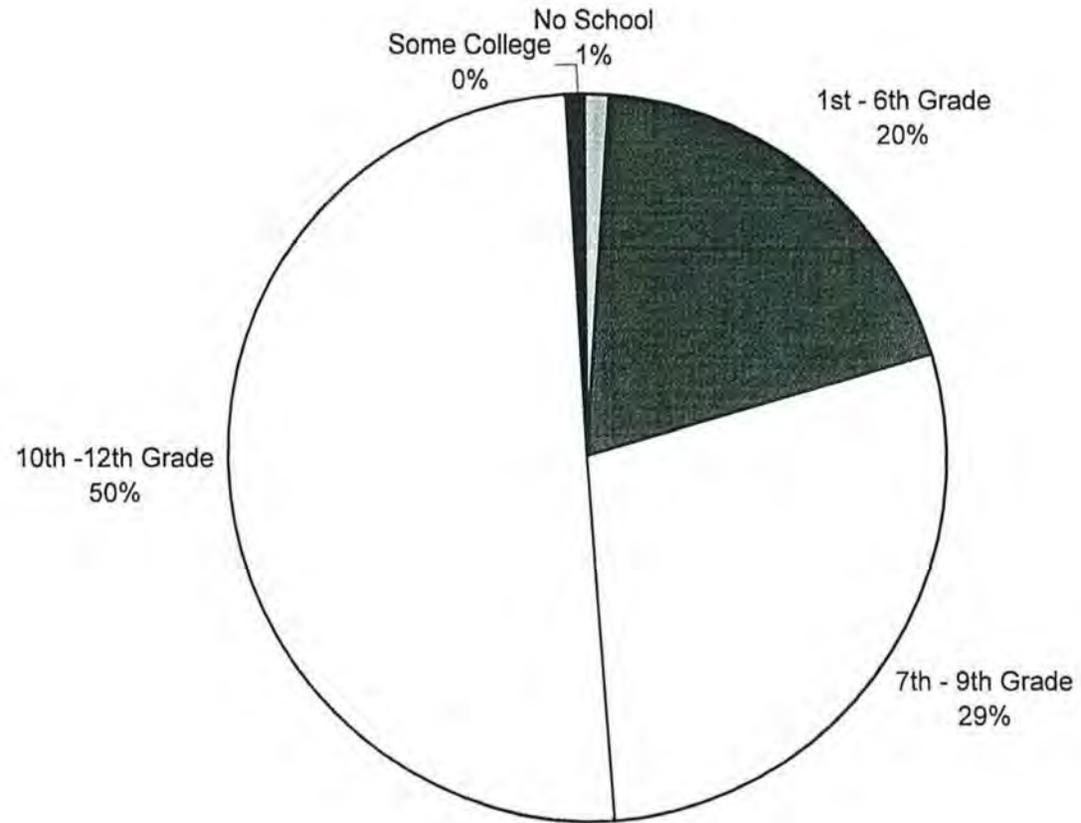
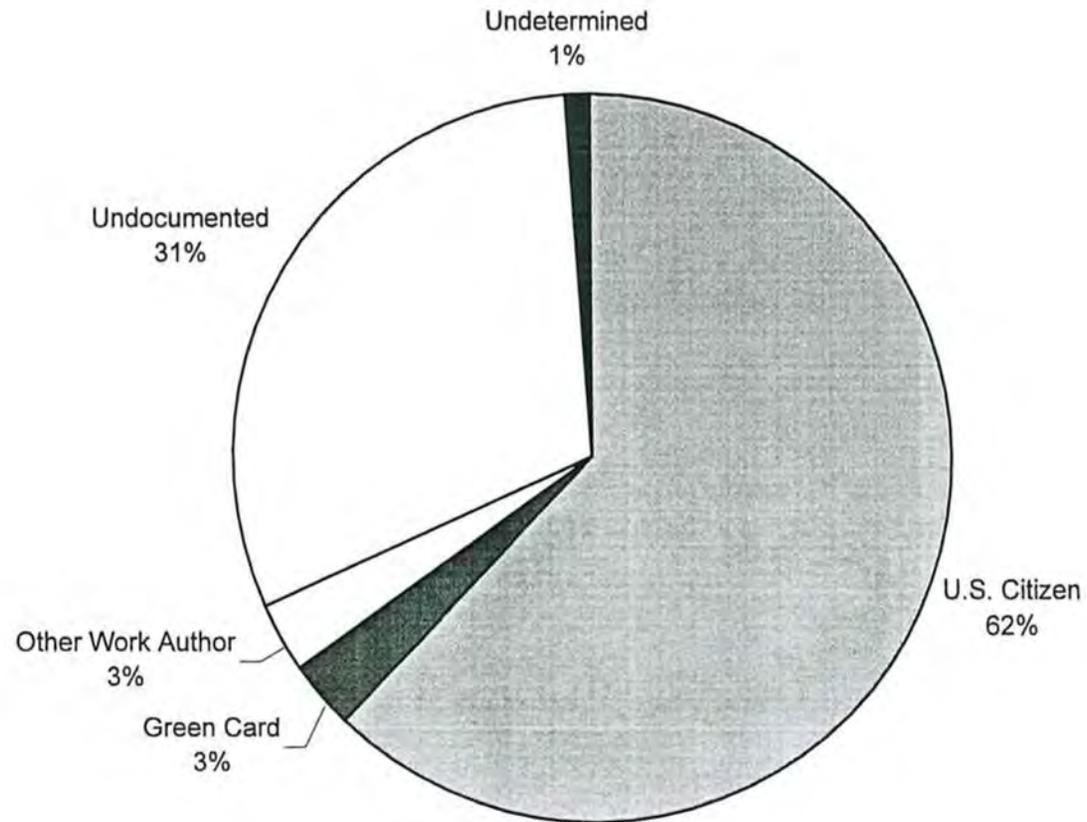


FIG 8

Minors, Hired Farm Workers, Immigration Status, FY1989-FY1996, NAWS, U.S.



U.S. Citizen, Hired Farm Workers, U.S. (NAWS)

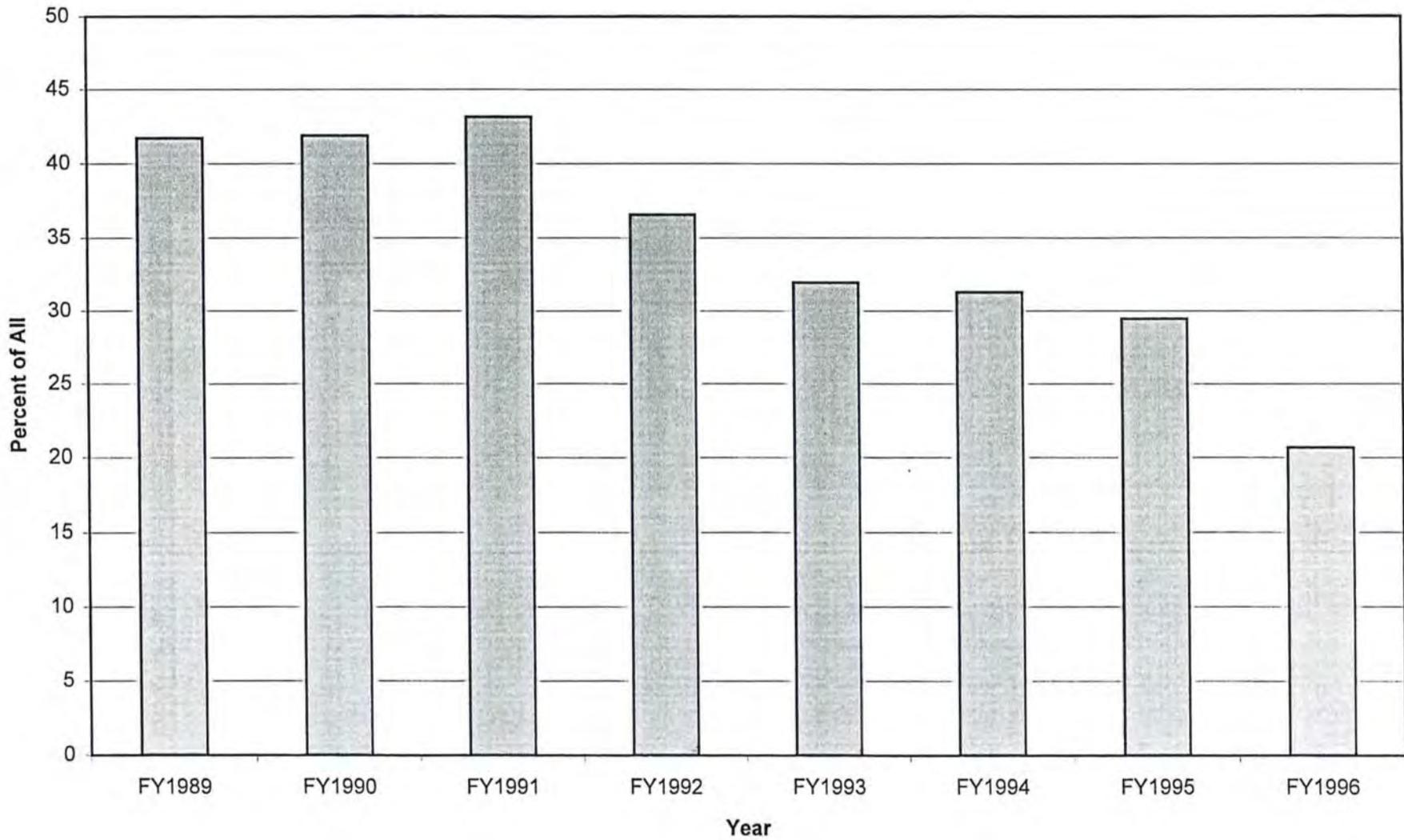
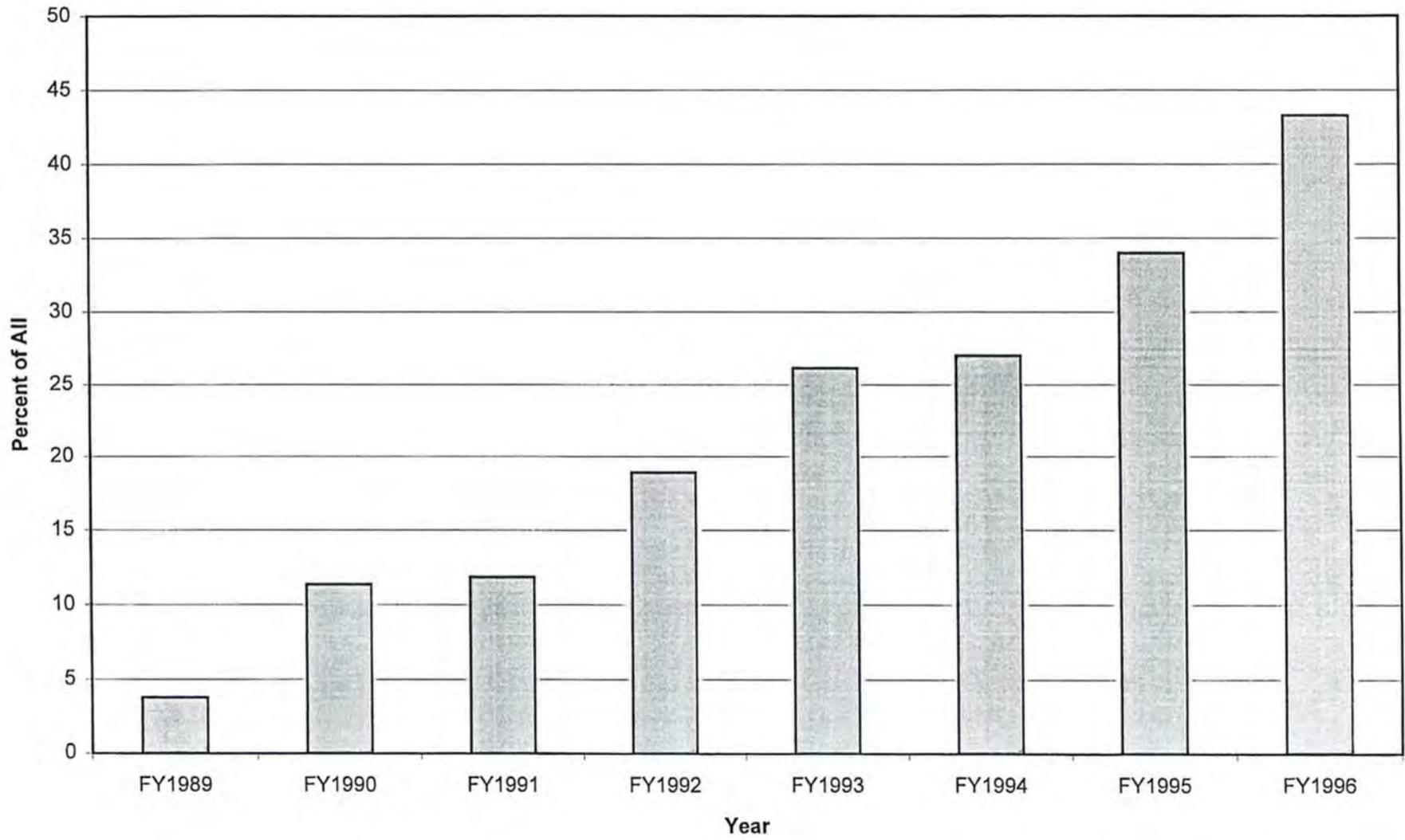
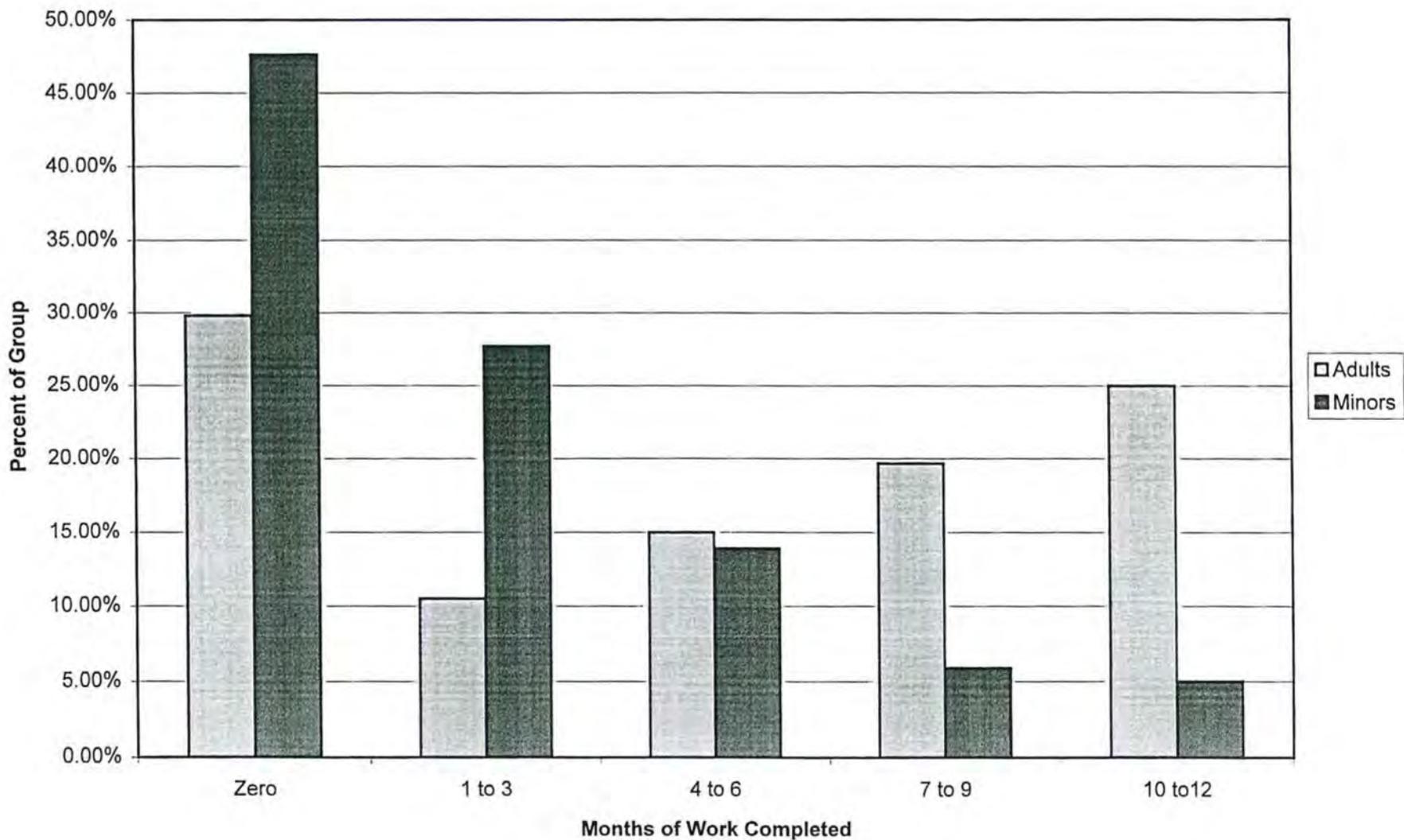


FIG. 10

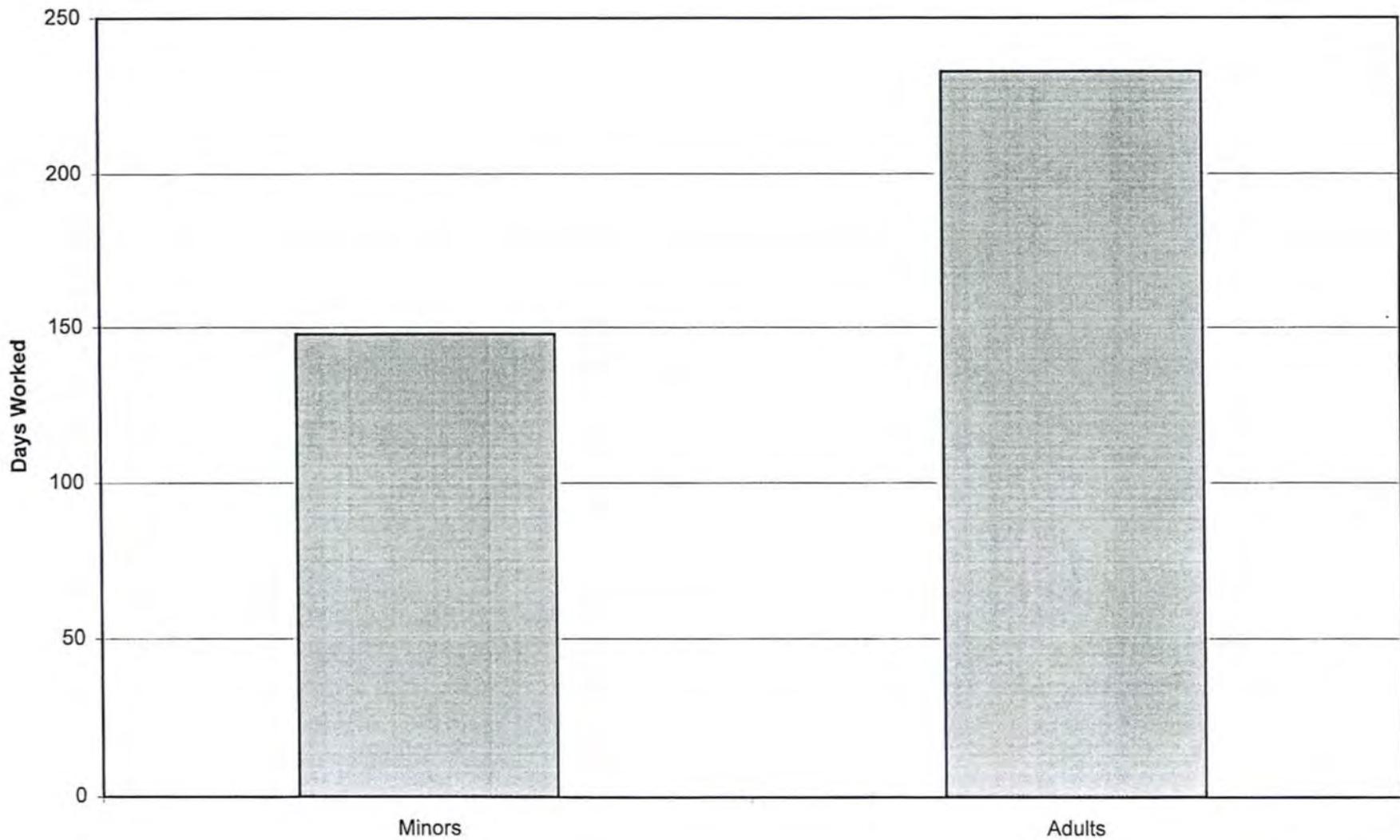
Undocumented, Hired Farm Workers, U.S. (NAWS)



Months of Hired Farm Work, Year Before Last, FY1989-FY1996, NAWS, U.S.



Average Days Worked in All Jobs, Prior Year, FY1989-FY1996, NAWS, U.S.



Minors, Hired Farm Workers, Type of Crop, FY1989-FY1996, NAWS, U.S.

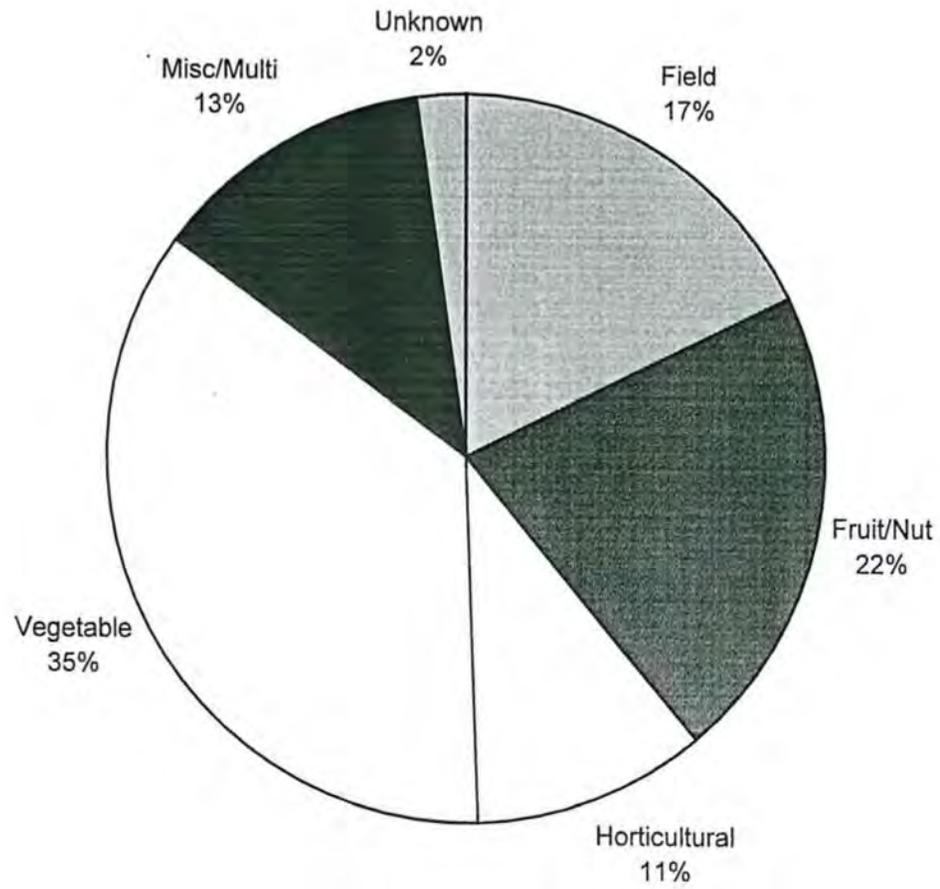


FIG. 14

Minors, Hired Farm Workers, by Type of Job, FY1989-FY1996, NAWS, U.S.

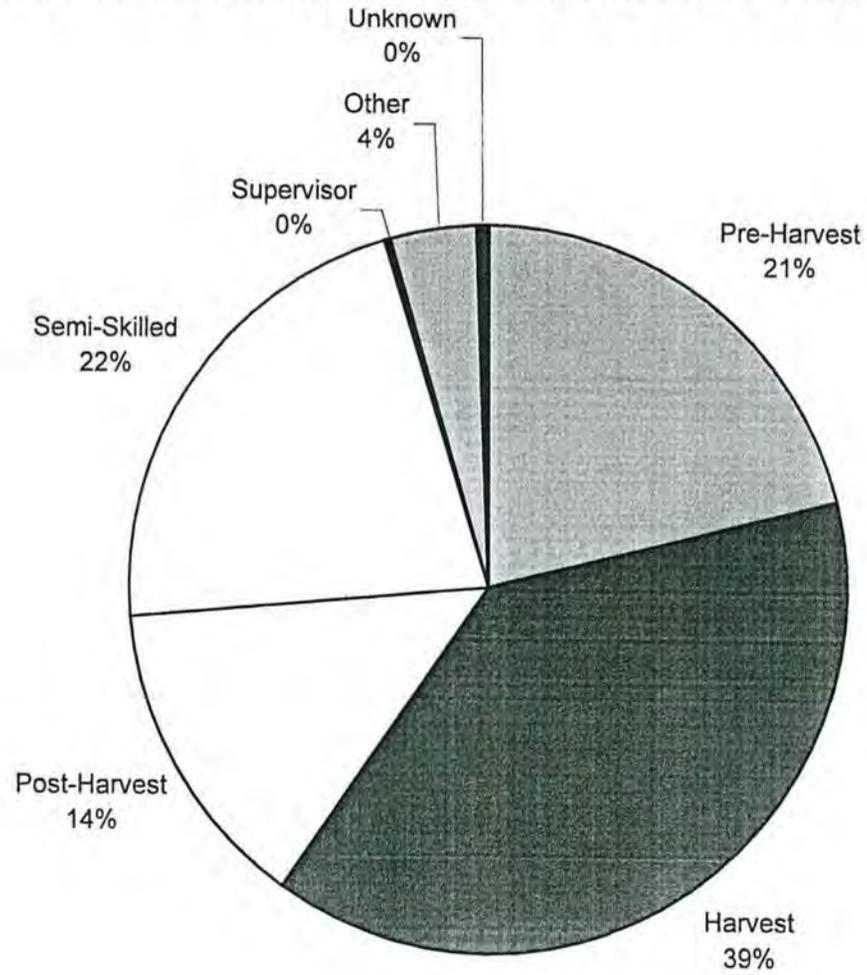
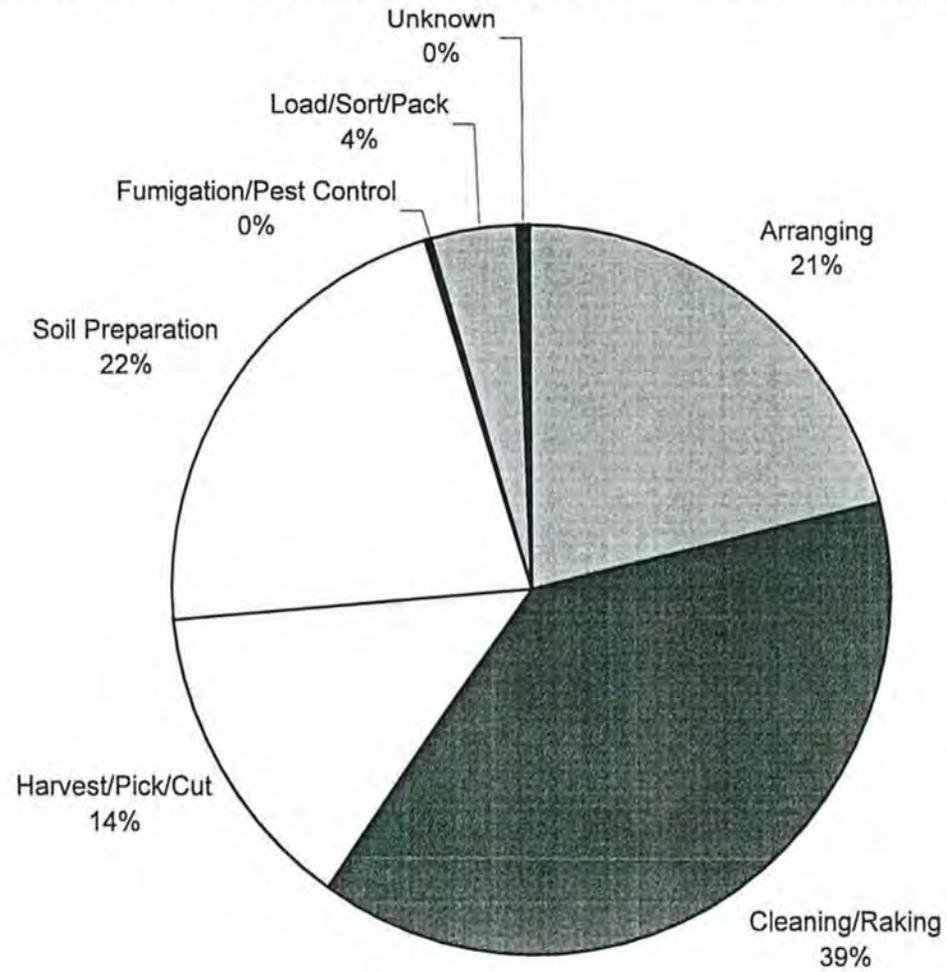


FIG. 15

Minors, Hired Farm Workers, by Type of Task, FY1989-FY1996, NAWS, U.S.



Minors, FLC Hired Farm Workers, Immigration Status, FY1989-FY1996, NAWS, U.S.

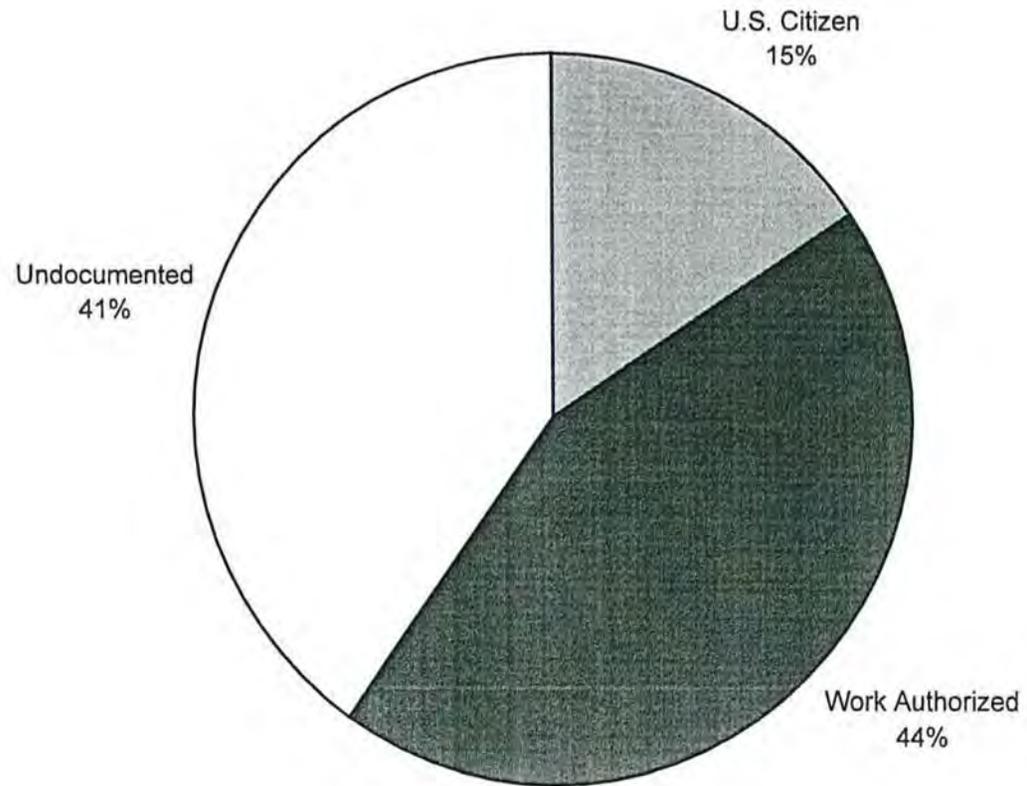


FIG. 17

Minors, Direct Hire Farm Workers, Immigration Status, FY1989-FY1996, NAWS, U.S.

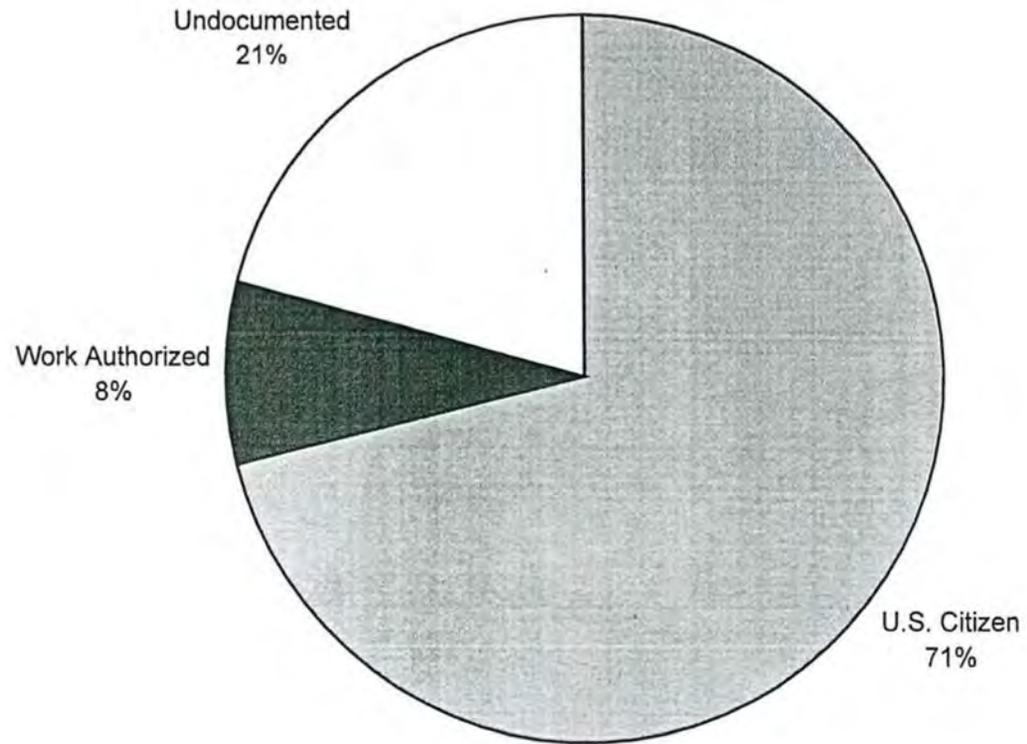
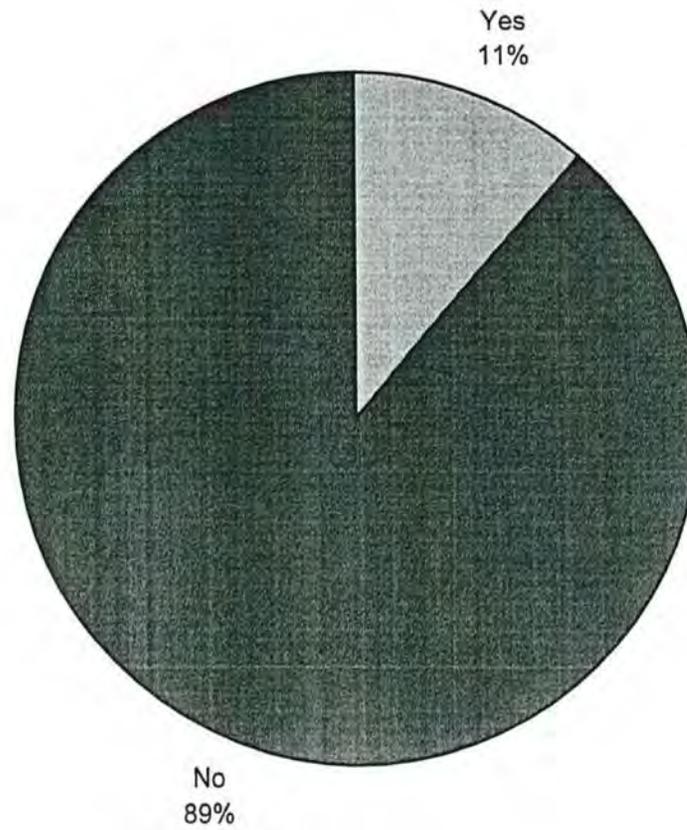
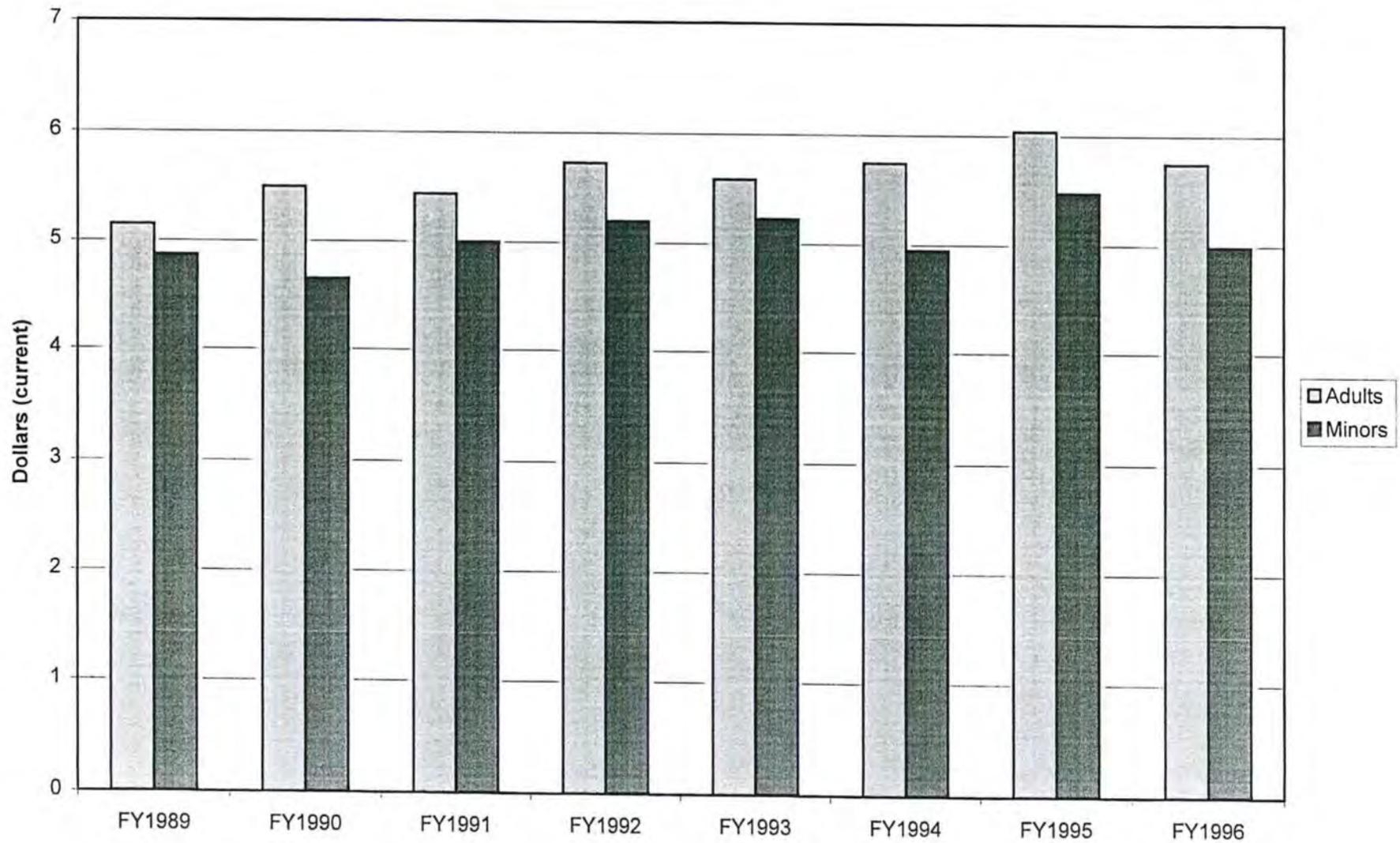


FIG. 1B

**Minors, Hired Farm Workers, Required to Pay Grower or Contractor for Ride to Job, FY1989-
FY1996, NAWS, U.S.**



Hourly Earnings, Adults & Minors, Hired Farm Workers, NAWS, U.S.



Personal Income, Adult & Minor Hired Farm Workers, FY1989-Fy1996, NAWS, U.S.

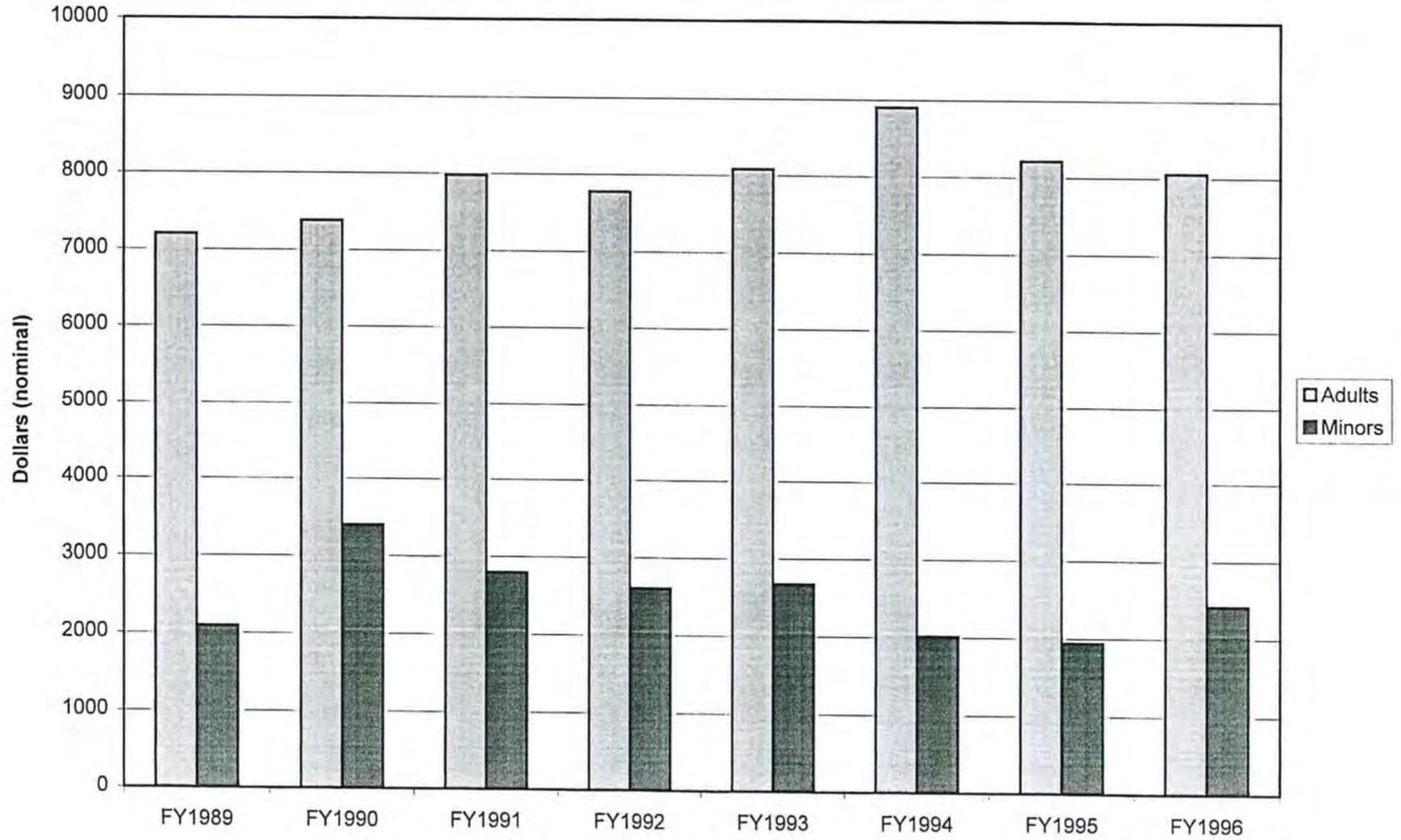
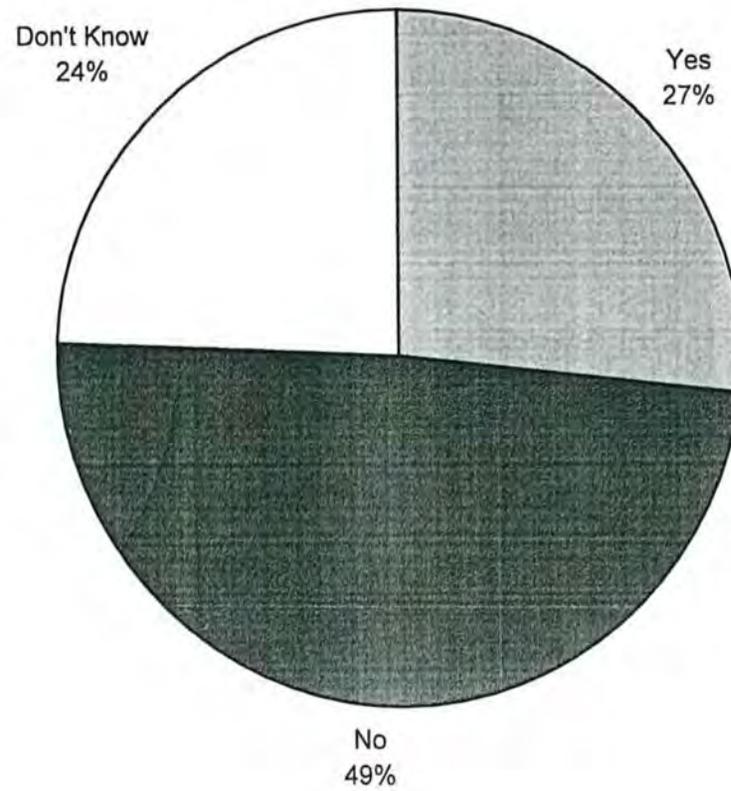
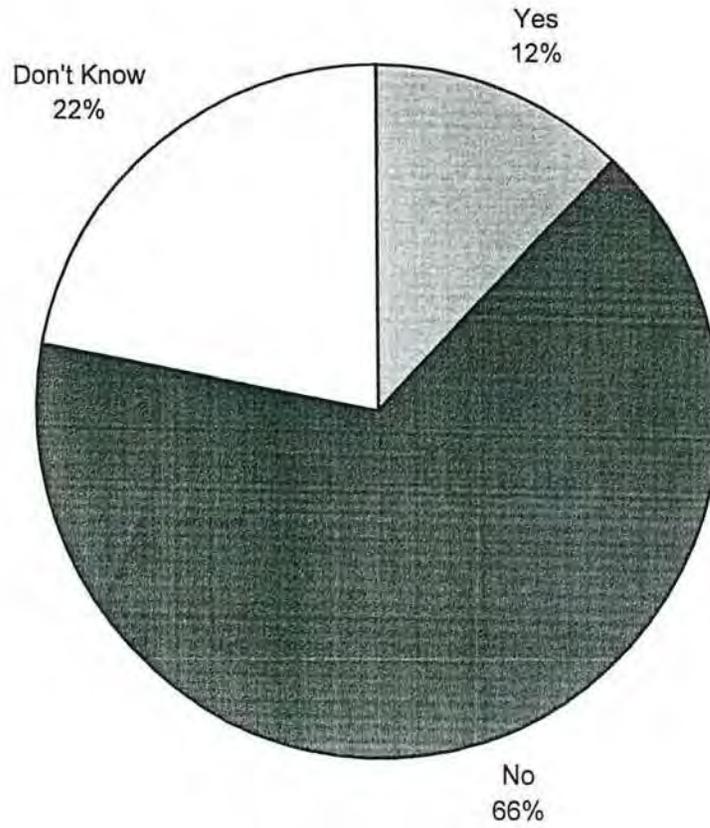


FIG. 21

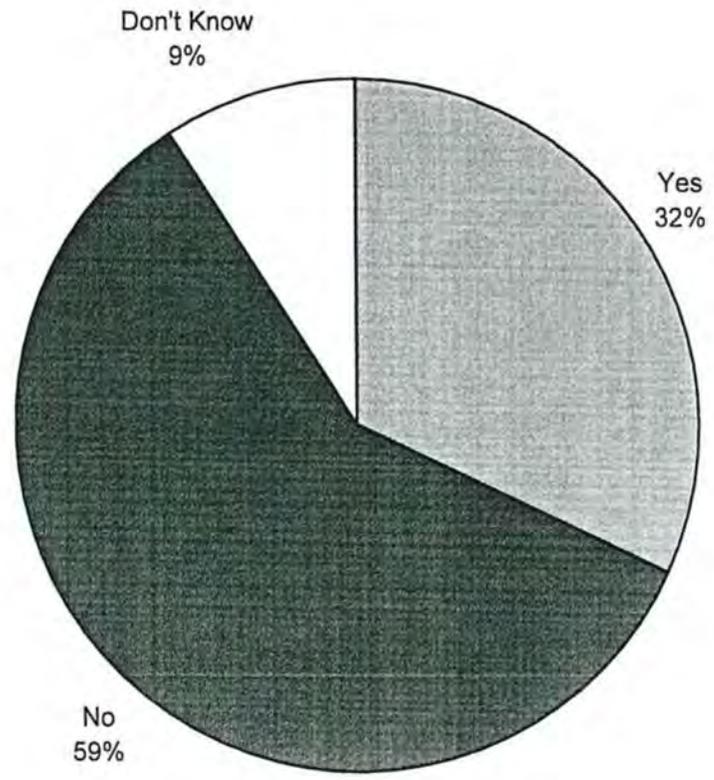
**Minors, Hired Farm Workers, Workers Compensation by Employer?, FY1989-FY1996, NAWS,
U.S.**



Minors, Hired Farm Workers, Workers Compensation by Employer?, FY1989-FY1996, NAWS, California



**Adults, Hired Farm Workers, Workers Compensation by Employer?, FY1989-FY1996, NAWS,
California**



Minors, Hired Farm Workers, Employer Provided Health Insurance for Off-Job Illness or Injury, FY1989-FY1996, NAWS, U.S.

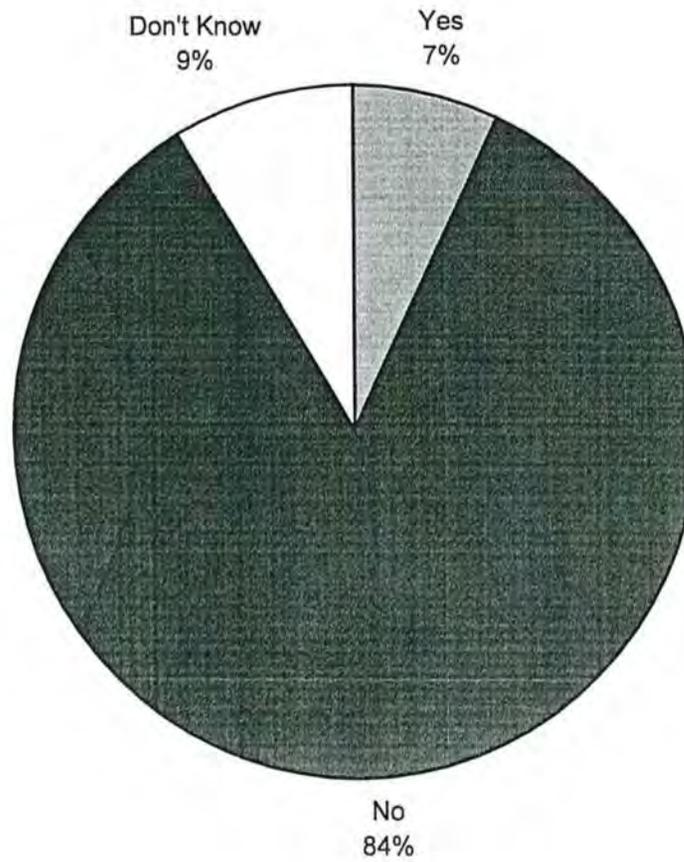
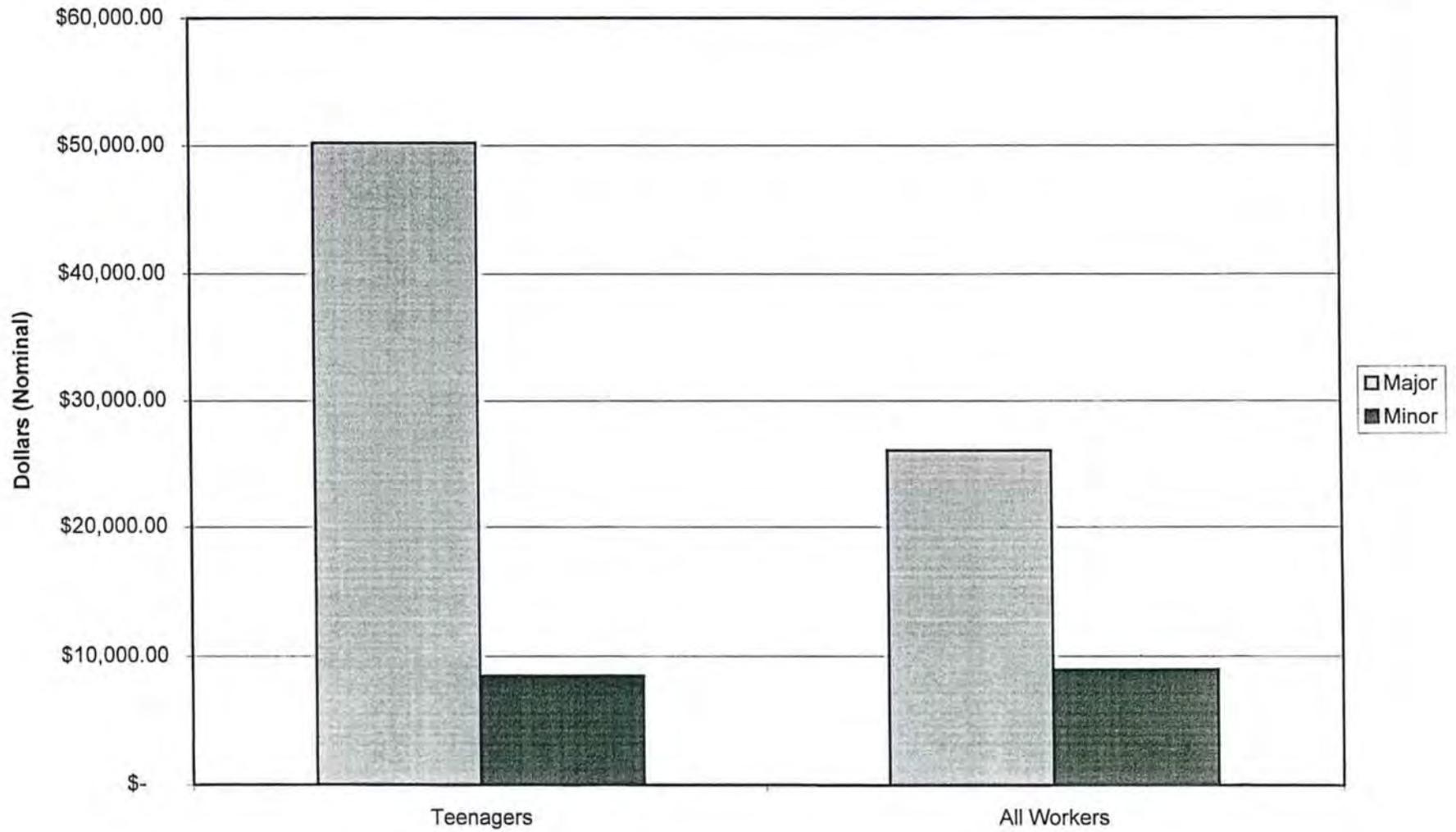


FIG. 25

Teenage and All Hired Farm Workers, Average Medical Cost for Permanent Disability, Paid Claims Under Workers Compensation, California, 1991-94, WCIRB



Teenage and All Hired Farm Workers, Average Indemnity Cost for Permanent Disability, Paid Claims under Workers Compensation, California, 1991-94, WCIRB

