

**Arizona Migrant and Seasonal Farmworker High
Density Areas**

REPORT:

**ARIZONA MIGRANT AND SEASONAL FARMWORKER
HIGH DENSITY AREAS**

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I. INTRODUCTION

This report identifies the annual distribution cycles of the migrant and seasonal farmworker population in Arizona. This information will allow for improved planning and provision of appropriate health care services (as well as other services) to this population.

Under Public Law 87-692 (76 Stat. 592) migrant and seasonal farmworkers were given the right of access to high quality health care services. The temporary nature of seasonal farm labor, and the movement of large numbers of farmworkers to various states, greatly complicates the provision of these services. Fortunately, migratory and seasonal farm laborers follow regular patterns of employment.

Since most seasonal farm work is paid on a piece work basis, both individuals and families tend to specialize in one crop or a related set of crops. This allows them to maximize their earning power by developing and maintaining the highest possible speed in harvesting, and therefore the highest payment rate for a harvest. By specializing in one crop, such as grapes or lettuce, or in related crops, like citrus and apples, the farmworkers build up economic efficiency. Thus the farmworkers tend to follow a single harvest; picking citrus early in Texas, moving to the Arizona

citrus harvest, then to California, and finally to the Apple harvest in Washington, before returning once again to their home base state. This means that each major new crop that becomes ready for harvest in Arizona is harvested by a new group that specializes in the seasonal farm labor for that crop.

The duration of many of the harvests in the state are from sixty to ninety days, although some are longer and a few shorter. So, while on any given date there appear to be 3,000 to 5,000 migrant farmworkers in the state, there will be a completely different set of individuals, albeit about the same total number, two to three months later. The actual number of unduplicated farmworkers depends on the number of different types of harvests, their size, and duration. This annual linkage between crops and identifiable concentrations of farmworkers is the basis for the estimates of migrant and seasonal laborers provided in this report.

II. METHODOLOGY

The method used to create the Arizona estimates of migrant and seasonal farmworkers is based on identifying the existing acreage of labor intensive crops, then the application of a formula that takes into account the number of hours needed to harvest the crops, the man hours worked per day, and the duration of the harvest. This method is detailed in the Department of Health and Human Services publication, "Methodology for Designating High Impact Migrant and Seasonal Agricultural Areas," (DHHS 1985). This methodology reasonably accurately allows the identification of counties where migrant and seasonal farmworkers can be found at

various times of the year, using agricultural data published by the state. The estimates are produced by applying the following formula:

$$E = \frac{A \times H}{W \times S}$$

Where A equals the total acreage harvested for a crop; H equals the average number of man hours needed to harvest one acre of the crop; W equals the average number of hours worked per farmworker per day; and S equals the length of the harvest season in days.

Annual agricultural statistics for Arizona are available from the Agricultural Statistics Service, in Phoenix. Published information from that source provided the data on the overall list of labor intensive crops in the state, as well as the timing and duration of the harvests. However, with the exception of Maricopa and Yuma counties, most of the data for the state was aggregated into state wide totals. Since the purpose of the project was to identify areas within Arizona counties that had high periodic concentrations of migrant and seasonal farmworkers, this data was only partially sufficient for our purposes.

The solution was to contact each of the county Cooperative Extension Service offices in the state, requesting additional information. Each office was provided with a set of 63 maps, one for each labor intensive crop found somewhere in the state. The county agricultural extension agent was then asked to note whether or not the crop was grown in the county. If grown, we requested a

report on the number of acres grown last year, plus an estimate of the average number of person days spent on one acre for maintenance, harvest and processing. We also requested an estimate of the number of persons working on that crop in the county, as a check against the DHHS formula. A later contact was made with each county agent, asking for the harvest dates for each crop grown, since this information was neglected in the initial survey. In addition to the acreage and harvest information, the county agents were asked to draw in the approximate location of the crops on the maps provided. This produced a within county location for each labor intensive crop grown in the state. Combining this information with the agricultural statistics data allowed us to estimate both the numbers and the within county location of migrant and seasonal farmworkers in Arizona, on a month by month basis. For planning purposes, this is a considerable improvement over the less specific data provided by the DHHS method.

The second set of data identified for the project was the location of the primary health care centers in the state that are likely to be used by migrants (see Gordon 1984, Arizona Statewide Health Coordinating Council 1986). The facilities identified in these sources included the state's three migrant health centers, most of the Community Health Centers, and the emergency rooms of local hospitals. In their home base locations, migrant and seasonal farmworkers use virtually all of the health care services that are available, including the Public Health Services in that state. However, when they are in an up-stream location, most health care

services, and especially the preventative services, are utilized by only a few migrants. For the most part, when migrants are away from their home base, they only use the services that are useful in a crisis situation. Therefore, only the clinic and hospital services most likely to be used were identified for the maps created for this project.

III. RESULTS

The first set of data necessary for the project was the identification of labor intensive crops in Arizona. The initial list was derived from the 1985 Arizona Agricultural Statistics report (Arizona Agricultural Statistics Service 1986), cross referenced with the crops listed in the DHHS methodology (DHHS 1985). Both lists were modified by some additional information provided by the agricultural extension agents in the various counties in Arizona. As noted above, a survey was conducted in each county to determine the presence or absence of each of the labor intensive crops, as well as the acreage harvested, etc. The results are presented below, in Table 1, LABOR INTENSIVE CROP ACREAGE SUMMARY BY COUNTY.

TABLE 1: LABOR INTENSIVE CROP ACREAGE SUMMARY BY COUNTY

1. Apache County

(household farm labor only)

2. Cochise County

Apples (4500)	Onions, Dry (200)
Chilies (800)	Peaches (700)
Commercial Flowers (20)	Potatoes (200)
Grapes (200)	Squash (200)
Jalapeno (50)	Sweet Corn (200)

- | | |
|-----------------------------|----------------------|
| Lettuce (2000) | Watermelons (175) |
| 3. Coconino County | |
| (household farm labor only) | |
| 4. Gila County | |
| (household farm labor only) | |
| 5. Graham County | |
| Apples (3000) | Peaches (50) |
| Cantaloupes (100) | Pecans (150) |
| Onions, Dry (30) | |
| 6. Greenlee County | |
| Chilies (10) | Jalapeno (5) |
| Honeydews (3) | |
| 7. La Paz County | |
| Broccoli (50) | Lettuce (3000) |
| Cantaloupes (2000) | Tomatoes (500) |
| Honeydews (1400) | Watermelons (300) |
| Jojoba (900) | |
| 8. Maricopa County | |
| Almonds (2000) | Jojoba (5000) |
| Apples (20) | Lemons (2000) |
| Apricots (50) | Lettuce (5860) |
| Beets (70) | Onions, Dry (1150) |
| Bell Peppers (3) | Onions, Green (1335) |
| Bok Choy (100) | Oranges (11,900) |
| Broccoli (930) | Parsley (155) |
| Cabbage (1625) | Peaches (200) |
| Cantaloupes (6075) | Pecans (4000) |
| Carrots (2010) | Plums (400) |
| Chilies (16) | Potatoes (5840) |
| Commercial Flowers (611) | Pumpkins (17) |
| Escarole (25) | Rapini (500) |
| Endive (90) | Spinach (200) |
| Grapefruit (4200) | Squash (200) |
| Grapes (3000) | Sweet Corn (630) |
| Greens (2030) | Tangerines (2000) |
| Honeydews (510) | Turnips (254) |
| Jalapeno (6) | Watermelons (2450) |
| 9. Mohave County | |

(household farm labor only)

10. Navajo County

(household farm labor only)

11. Pima County

- | | |
|---------------|------------------|
| Bok Choy (20) | Lettuce (1000) |
| Carrots (40) | Onions, Dry (10) |
| Chilies (40) | Pecans (5000) |
| Greens (20) | Sweet Corn (400) |

12. Pinal County

- | | |
|-------------------|-------------------|
| Apples (45) | Honeydews (400) |
| Apricots (40) | Lettuce (200) |
| Broccoli (40) | Lemons (50) |
| Cantaloupes (250) | Oranges (500) |
| Carrots (40) | Pecans (1500) |
| Figs (80) | Rapini (150) |
| Grapefruit (150) | Sweet Corn (300) |
| Grapes (500) | Watermelons (150) |

13. Santa Cruz County

(Commercial distribution plants only)

14. Yavapai County

(household farm labor only)

15. Yuma County

- | | |
|--------------------|--------------------|
| Bok Choy (80) | Jojoba (4000) |
| Broccoli (1800) | Lemons (15,000) |
| Cantaloupes (1300) | Lettuce (37,000) |
| Cabbage (60) | Oranges (4210) |
| Endive (50) | Potatoes (250) |
| Escarole (40) | Pecans (656) |
| Grapefruit (2240) | Squash (20) |
| Grapes (25,000) | Tangerines (1310) |
| Honeydews (200) | Watermelons (1153) |

*Needs update done
To change to
AZ Ag. to
88 crops*

(a) 1986 estimates, as reported by County Agriculture Extension Agents for each county.

(b) Household labor only on carrots, cantaloupes and honeydews in Cochise County.

(c) Household labor only on apples, cantaloupes, pecans, pumpkins, sweet corn, and watermelons in Greenlee

County.

- (d) Pinal County normally grows 1000 acres of watermelons, but the Temic scare in California has reduced that acreage drastically.

The acreages listed above are only from those counties where migrant and seasonal help is used. As noted in the table, if the growers rely solely on household labor, the crop was omitted from the calculations for that county.

The data was then plugged into the formula listed above, to estimate the number of migrant and seasonal laborers needed for that harvest. The harvest time estimates provided by the DHHS methodology (DHHS 1985 pg. II-3 and II-4) were applied to the Arizona crops listed in the table, SUMMARY OF HARVEST HOURS PER ACRE OF LABOR INTENSIVE CROPS, found in the appendix to this report. The appendix also provides a monthly crop calender, by county, that indicates the general harvest times for Arizona's labor intensive crops. This application of the DHHS formula resulted in the estimates of migrant and seasonal labors, by month and county, presented in Table 2, below.

TABLE 2

ESTIMATES OF MIGRANT AND SEASONAL FARMWORKERS
BASED ON LABOR INTENSIVE CROPS BY MONTH AND COUNTY

County	Month					
	January	February	March	April	May	June
Cochise	-	-	-	-	114	118
Graham	-	-	-	-	19	5
Greenlee	-	-	-	-	12	12
La Paz	113	113	113	-	118	128
Maricopa	2911	2409	2158	2120	1469	2171
Pima	26	11	-	56	74	16

Pinal	84	84	4	-	58	79
Yuma	2381	2368	440	2223	4827	3074
	January	February	March	April	May	June
Total State	5515	4985	2715	4399	6691	5603

Month

County	July	August	September	October	November	December
Cochise	158	593	197	433	586	118
Graham	5	-	313	323	15	5
Greenlee	10	-	-	-	-	-
La Paz	178	60	50	177	354	177
Maricopa	1566	839	957	1062	3199	3038
Pima	-	-	-	227	241	16
Pinal	78	43	97	82	124	63
Yuma	343	301	2124	3488	3730	3899
State Total	2338	1836	3738	5792	8249	7316

One of the weaknesses of the DHHS formula is that it only estimates individuals needed (or, more accurately, the number of jobs that are available) in a harvest. Most of the migrant and seasonal laborers in Arizona are families that may have non-working dependents with them in addition to the individuals doing the harvesting. It also has the weakness of assuming that all of the individuals working the harvests are adults. But direct observation indicates that there is a significant contribution to the family labor pool from children between the ages of 8 and 17. The total amount of harvest labor that is contributed by these individuals is proportionately less than the adults, even though they make a significant contribution to the family income; thus the formula underestimates the number of people harvesting the crops.

Therefore, as suggested by the DHHS methodology, the number

of non-working dependents was calculated for each crop. The constant, (.5) was used to estimate dependents. Sources suggest there are approximately two dependents for each four workers. This results in the information presented in Table 3.

TABLE 3
ESTIMATES OF MIGRANT AND SEASONAL FARMWORKERS AND THEIR
DEPENDENTS BASED ON LABOR INTENSIVE CROPS BY MONTH AND COUNTY

County	Month					
	January	February	March	April	May	June
Cochise	-	-	-	-	171	177
Graham	-	-	-	-	29	8
Greenlee	-	-	-	-	18	18
La Paz	170	170	170	-	177	192
Maricopa	4367	3614	3237	3180	2204	3257
Pima	39	17	-	84	111	24
Pinal	126	126	6	-	87	119
Yuma	3572	3552	660	3335	7241	4611
State Total	8274	7479	4073	6599	10,038	8406

County	Month					
	July	August	September	October	November	December
Cochise	237	890	296	650	879	177
Graham	8	-	470	485	23	8
Greenlee	15	-	-	-	-	-
La Paz	267	90	75	266	531	266
Maricopa	2349	1259	1436	1593	4799	4557
Pima	-	-	-	341	362	24
Pinal	117	65	146	123	186	95
Yuma	515	452	3186	5232	5595	5849
State Total	3508	2756	5609	8670	12,375	10,976

The data in Table 3 can be effectively combined with the locational data in each of the maps in the Appendix to provide a

county by county estimate of both the location and the numbers of migrant and seasonal farmworkers and their dependents on a month by month basis for the whole state. The first twelve maps show the monthly location of farmworkers, by county. A subsequent map shows the total farmworker locations for the year, and another shows the locations of farmworkers in relation to the primary health care institutions that farmworkers might use, if not prevented by economics or distance.

A second weakness of the DHHS method for estimating numbers of farmworkers is that it does not produce an estimate of the unduplicated number of migrant and seasonal farmworker jobs for the counties, or the state as a whole. However, such an estimate is possible from the data collected for this project; an estimate based on the assumption, detailed above, that the majority of the individuals working on each new crop in the state are different individuals from those working other crops, unless the crops are closely related and economic efficiency can be maintained in moving from one harvest to another. The extent to which this assumption fails to be met creates an over-estimate of unduplicated farmworkers. This over-estimate is off-set by the fact that the method used to estimate unduplicated workers assumes that no new workers join the harvest after the first month. Since new workers obviously do join the harvest, and others leave, the following estimates will actually be on the conservative side.

The estimates of unduplicated workers were calculated by applying the DHHS formula to each new crop, for the first month

the crop was harvested in each county, but dropping the total labor contribution made by that crop for each succeeding month that the crop was harvested. This method also points up the time periods when there are heavy influxes of new workers, even though the total number of workers in the state may have remained stable due to the end of an unrelated harvest. The information on the estimates for total unduplicated workers is presented in Table 4.

TABLE 4

ESTIMATES OF TOTAL UNDUPLICATED SEASONAL AND MIGRANT
FARMWORKERS BY MONTH

Month	January	February	March	April	May	June
Est. Workers	524	0	525	2087	3847	1082
Est. Dependents	262	0	263	1044	1924	541
Total	786	0	788	3131	5771	1623

Month	July	August	September	October	November	December
Est. Workers	539	415	3021	2162	3162	316
Est. Dependents	270	208	1511	1081	1581	158
Total	809	623	4532	3243	4743	474

Total Annual estimate = 26,523

Total Annual estimate
including Dependents = 39,785

There are six different times during year, as seen in Table 4, when major influxes of migrant and seasonal farmworkers occur in arizona: 1) April: Spring lettuce harvest begins; 2) May: Grape harvest begins; 3) June: Multiple crop harvesting state wide; 4) Sept.: Fall lettuce harvest begins; 5) Oct.: Citrus harvest increases significantly; 6) Nov.: Mixed vegetable harvest begins. There are also several minor turn-over points at other times of the

year. This results in a migrant and seasonal annual labor force estimate for Arizona of 26,523 workers, 13,262 dependents, and a total (conservative) population estimate of 39,785 migrant and seasonal farmworkers and their families. Section IV compares the estimates in this section with the counts and estimates of migrant and seasonal farmworkers derived by other agencies in Arizona.

V. OTHER ESTIMATES OF MIGRANT AND SEASONAL FARMWORKERS

In addition to health related programs, there are several major support agencies in Arizona that are directed to provide significant services to migrant and seasonal farmworkers. These include the Arizona Department of Education, The Arizona Department of Economic Security (DES), the Arizona Cooperative Extension Service, and PPEP, Inc. Each of these institutions estimates the number of migrant and seasonal farmworkers that are eligible for their services, or records the number of workers utilizing their services.

A. Cooperative Extension Service Estimates

The Cooperative Extension Service uses estimates published by the Arizona Agricultural Statistics Service, Inc., which is a cooperative function of the U.S. Department of Agriculture and the College of Agriculture at the University of Arizona (Arizona Agricultural Statistics Service 1986). Their estimates are produced by periodic surveys of agricultural labor in the state. The 1985 and 1986 survey results are as follows:

Total Farm Labor for Arizona

1984	(150+ days)	(149- days)
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July 8-14	11000	4000
Oct. 7-13	8000	3000
1985	(150+ days)	(149- days)
Jan. 6-12	16000	3000
April 7-13	16000	4000
July 7-13	13000	5000
Oct. 6-12	14000	4000

a) Source: 1985 Arizona Agricultural Statistics, Arizona Agricultural Statistics Service, 201 East Indianola, Suite 250, Phoenix, Az. 85012.

b) The data from 1985 on combines the data from Arizona and New Mexico (Mountain Region III).

The agricultural statistics surveys are "snap shots" of the agricultural labor force during the designated weeks. The figure that gives at least a partial estimate of migrant and seasonal population is the number of people working 149 days or less. Using the 1984 figures of 3000 and 4000 workers, and assuming the normal 6 fold turn-over of workers indicated by the state labor intensive crop data, produces an unduplicated estimate of between 18,000 and 24,000 migrant and seasonal farmworkers for the state, annually. The lower end of this estimate is quite close to the estimate produced by the DHHS labor intensive crop methodology, while the upper limit is reasonably close to the total estimate produced by combining the special populations with the labor intensive crop estimate. None of these estimates include dependents.

B. Arizona Department of Education Estimates

The Migrant Child Education Unit of the Arizona Department of Education provides special education programs for the children of migrant farmworkers. The migrant population, for the purposes of

this program, is divided into three categories; Interstate Children, whose families have moved across state boundaries in the past 12 months, Intrastate Children, whose families have moved across school district boundaries within the state within the past 12 months, and Formerly Migrant Children, whose families have moved more than 12 months (up to 5 years) previously. Based on the number of each category of children they served last year, the Unit provided the following estimates for Arizona.

1) School Age Migrant Children

Interstate Children	=	5664
Intrastate Children	=	3588
Formerly Migratory	=	9897
Total Children	=	19149

2) Estimate of Total Migrants

Interstate Migrants	=	7930
Intrastate Migrants	=	5023
Formerly Migratory	=	13856
Total	=	26809

a) Source: Education For Migrant Children. Arizona State Plan, Program Year 1987. Arizona Department of Education.

b) Based on an estimate that the average migrant family has five children; personal communication, Dr. J. O. Maynes, Jr., Director, Migrant Child Education Unit, Arizona Department of Education.

The figures for individuals who have migrated in the past twelve months are much lower than the estimates from the DHHS methodology for labor intensive crops, while the estimates from all migrants are higher. The total migrant estimates are fairly close to the higher limit estimates derived from the Cooperative Extension Service estimates. The "bracketing" effect produced in

comparing the labor intensive estimates to those from Migrant education are probably due to the differences in the definitions of migrant and seasonal laborers used by the two organizations.

C. Arizona Department of Economic Security Estimates

The Arizona Department of Economic Security records estimates of migrant and seasonal farmworkers eligible for its services on a monthly basis. These estimates are compiled by outreach workers in specified offices in Cochise, Maricopa, Pinal, and Yuma counties. The areas covered by the offices involved in the estimates are presented in a map in the appendix. The DES staff estimates are not based on survey information, nor is any formula used to create the estimates, therefore they must be seen as educated guesses by the staff. For 1985, the estimate was 11,398, according to Douglas K. Patino, Director (source: 1985 Annual Report). This estimate is the least compatible with the ones produced by other agencies or by the DHHS methodology. However, Mr. Patino also stated that DES uses the figure of 22,000 migrants provided by the Agricultural Extension Service for planning purposes.

D. Portable Practical Educational Preparation, Inc. Estimates

PPEP is a non-profit organization, originally created through funding from the Office of Economic Opportunity (OEO) program, but continuing through to the present. It provides educational opportunities and job training programs for migrant and seasonal farmworkers. The PPEP corporation commissioned an analysis of the 1980 U.S. Census of Population data from Arizona, to determine the

economic status and educational needs of migrant farmworkers in the State. That analysis provides the following estimates of farmworkers in Arizona (PPEP n.d.):

Total Farmworker Households = 15440

White Households	= 6820
Black Households	= 240
Hispanic Households	= 7440
Other Households	= 940

Total Farmworker labor force = 18360
Non-U.S. Citizen labor force = 1420

These figures are generally compatible with the estimates derived from the DHHS methodology, and those of the Department of Education and the Agricultural Extension Service. Using the (.3) dependency factor, the 18,360 workers would have a total of 5508 dependents, and a total population of 22,868 individuals.

VI. SUMMARY

Combining the labor intensive crop based estimates of migrant and seasonal farmworkers (DHHS 1985) with estimates of additional farmworkers belonging to special populations that are a result of the special geographical and environmental resources of Arizona produces a total estimated migrant and seasonal farmworker population of 23,398 for the state (30,291 when non-working dependents are included). This estimate is compatible with, or in the same general range as estimates derived by other state agencies, from other sets of data.

The estimates produced in this report should be viewed as being extremely conservative. They are primarily the estimates of

the number of jobs created by the harvests and other agricultural activities, not the numbers of actual workers. Lupe Sanchez, Director of the Arizona Farmworkers Union noted that for many of the crops harvested last year there were as many as three to four workers for each job in the fields. These were people who had migrated into the state, but were unable to find employment. In addition to the unemployed workers not being counted, several of the state's experts in migrant workers felt that the dependency ratio of (.3) was far too low and should have been increased. Some felt it could even be doubled and still be reasonable.

The purpose of compiling the farmworker demographic estimates was to provide data for planning, and for assessing the current provision of health care services for migrant and seasonal farmworkers in Arizona. As can be seen from the maps in the appendix (derived from the survey data used to compile this report), many migrant and seasonal farmworkers in the state are significantly geographically separated from primary health care resources during their residency in Arizona. There are only three migrant health centers in the state. These centers are designed to meet the special cultural, occupational health, and disease needs of migrants. The latter is particularly important, because migrant farmworkers in the United States have been shown to have much higher incidents of some rare types of diseases, including some infectious tropical diseases that are not normally encountered in other populations. This makes the diagnosis of these diseases more difficult in non-migrant health care settings, since it is often

difficult for physicians to diagnose a disease they have never seen before, and may only have encountered years previously in a text book in medical school. It is much easier to diagnose an unusual disease if you expect to see it.

Migrant and seasonal farmworkers who are not close to the migrant health care centers designated on the maps in the appendix, or the other primary health care units in Arizona, must either go without health care, must travel long distances to receive any primary health care, or must use geographically close primary health care resources that are not well equipped to handle the unique conditions that migrants present to a modern health care setting. Each of these conditions need to be taken into account by the agencies and organizations that are responsible for assisting migrant farmworkers in Arizona. Poor health conditions amongst the migrants can easily be translated into health problems for many other citizens in the state.

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APPENDIX

SUMMARY OF HARVEST HOURS
PER ACRE OF LABOR INTENSIVE CROPS

1. Almonds (8)	21. Jojoba (40)
2. Apples (50)	22. Lemons (185)
3. Apricots (72)	23. Lettuce (54)
4. Beets (200)	24. Onions, Dry (133)
5. Bell peppers (120)	25. Onions, Green (300)
6. Bok Choy (20)	26. Oranges (71)
7. Broccoli (80)	27. Parsley (40)
8. Cabbage (20)	28. Peaches (65)
9. Cantaloupes (50)	29. Pecans (15)
10. Carrots (129)	30. Plums (48)
11. Cauliflower (80)	31. Potatoes (20)
12. Chilies ((400)	32. Pumpkins (30)
13. Commercial Flowers (400)	33. Rapini (200)
14. Endive (75)	34. Spinach (80)
15. Escarole (75)	35. Squash (40)
16. Figs (45)	36. Sweet Corn (30)
17. Grapes (50)	37. Tangerines (55)
18. Grapefruit (70)	38. Turnips (80)
19. Honeydews (50)	39. Watermelons (25)
20. Jalapeno (400)	

(a) Estimates are drawn from "Methodology for Designating High Impact Migrant and Seasonal Agriculture Areas", U. S. Dept. of Health and Human Services, PHS, BHCDA, Migrant Health Program (1985), pages II-3 and II-4.2