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Tracing Migrant Farmworkers In Starr County, Texas

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Background *In response to The National Cancer Institute (NCI) concerns about the ability to conduct studies among migrant farmworkers, this study evaluated the feasibility of identifying migrant farmworkers in their home state and tracing them over an extended period of time.*
Methods *In 1995, a group of 196 persons who had classified themselves as "migrant farmworkers" in two earlier chronic disease studies was identified. The primary objective of the current study was to determine the proportion of these farmworkers who could be located in 1995–1996.*
Results *Of these farmworkers, 163 were located and were living (83.2%), 15 had died (7.6%), and 18 (9.2%) were lost to follow-up.*
Conclusions *The excellent follow-up rate was due in part to the high participation rates among persons contacted for information, stability of the farmworkers' permanent homes, predictable timing of migration, and a longstanding health research program with established community contacts.* Am. J. Ind. Med. 40:586–591, 2001. *© 2001 Wiley-Liss, Inc.*

KEY WORDS: farmwork; migrant; pesticides; cancer; occupation; Hispanic; Texas

BACKGROUND/STUDY POPULATION

Migrant farmworkers are an integral part of the agricultural sector and economy in the US. On average, the majority of farmworkers earn less than $7,500 per year. The permanent residence for most migrant farmworkers is California, Texas, or Florida. These workers migrate from their homes across the US in sequence with crop planting, cultivating, harvesting, and processing. The pressure to perform tasks under deadlines determined by the seasons and the weather, forces farmworkers to work in fields in the extremes of weather, under conditions conducive to injury, and in close proximity to pesticides and chemical fertilizers [Meister, 1991; National Center for Farmworker Health, 1997].

The International Agency for Research on Cancer (IARC) concluded that there was limited or sufficient evidence for carcinogenicity of 50% of the pesticides evaluated in experimental studies [International Agency for Research on Cancer, 1991]. Farmers, a population at risk for greater exposure to pesticides, have been reported to experience an elevated risk for cancers of the lymphatic and hematopoietic system, connective tissue, lip, skin, stomach, prostate, and brain. Research to identify the specific pesticides or other exposures responsible for these excesses has been limited, but is ongoing [Zahm et al., 1997]. There have been almost no epidemiologic studies of cancers and very few on other chronic diseases among migrant farmworkers [Rust, 1990; Zahm and Blair, 1993]. In order to plan health studies of long latency diseases, such as cancer, evaluation of reseachers' ability to find, monitor, and survey migrant farmworkers is essential. In response to the National Cancer Institute (NCI) concerns about the feasibility of conducting cancer studies among migrant

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farmworkers, this study evaluated the ability to identify migrant farmworkers in their home state and trace them over an extended period of time.

Starr County, Texas, is one of the 14 Texas counties located on the Texas–Mexico border and is approximately 550 kilometers southwest of Houston. Based on the 1990 census, the population of Starr County was 40,518, 97% of whom are Hispanic (almost exclusively Mexican American). Among this population, there are an estimated 17,500 migrant farmworkers and family members (43%), and 13,600 (34%) seasonal farmworkers and family members, of which approximately 40% are workers (USDHHS, 1990). Starr County is one of the most impoverished counties in the country with more than half of the families classified below the poverty level [Hanis et al., 1983]. Approximately 10 years ago, some residents in Starr County participated in several studies on diabetes and gallbladder disease (conducted by one of the investigators). Although not an integral part of the earlier studies, occupational data were collected on the study participants. These occupational data were used to identify migrant farmworkers who we would attempt to trace and locate approximately 10 years later.

METHODS

For the past 16 years, Dr. Hanis and colleagues have conducted a series of investigations in Starr County, Texas, that have focused on chronic disease problems among Mexican Americans. Those studies have been centered in a field office that they have maintained in Starr County and in the course of those studies, more than 5,000 persons were examined. Of relevance to the present study were the 1,004 randomly selected individuals examined during 1984–1986 and an additional 1,254 individuals distributed in 240 pedigrees that were sampled from 1986–1987 [Hanis et al., 1983; Hanis et al., 1993]. In addition to detailed physical and laboratory evaluations on each of these individuals, occupational histories were obtained. Social security numbers were not collected due to their perceived sensitive nature. In 1995, a group of 200 persons who had classified themselves as ''migrant farmworkers'' in the earlier studies was identified. The primary objective of the current study was to determine the proportion of the 200 migrant farmworkers who were identified by participation in the studies conducted during 1984–1987, who could be located in 1995–1996.

Identifiers from the earlier studies were used to initiate contact. These identifiers included name, address (both mailing and street), phone, spouse's name, and parents' names. In some cases, children's names were also available. Office procedures, data collection forms, sample scripts, and a study questionnaire manual were developed and supplies were provided by The University of Texas investigators and staff in Houston. Three types of data were collected for this study: 1) information was recorded on every attempt to contact a study subject and to set up an interview with the study participant or proxy (e.g., frequency and time); 2) information was abstracted from death certificates when it was learned that a study subject had died; and 3) a questionnaire was administered to successfully located subjects or their proxies to determine current location, occupation, migration patterns, and contact information. Additionally, subjects (or proxies) were invited for a free blood pressure/blood glucose screening at the Starr County Health Studies Office, due to the high prevalence of diabetes in this population.

A study questionnaire manual was developed to facilitate the training of the Starr County interviewers ($n = 8$) and for study documentation and analysis. An on-site study training session was conducted for the eight interviewers in Starr County by study investigators on December 18, 1995. These seasoned interviewers were previously trained and were experienced in tracing study subjects and administering questionnaires. Interviewers began attempts at contacting study subjects on December 21, 1995 and the last contact attempt and/or interview was completed on April 3, 1996. Forms were reviewed and edited, and were transferred to the Houston office for data entry and analysis. Data were coded and double-entered into a FoxPro database for analysis.

RESULTS

Demographic Characteristics

Four of the 200 identified migrant farmworkers were duplicates; therefore, the final study population consisted of 196 study subjects. The gender of the study population was approximately equally distributed, 100 males and 96 females. If a subject could not be located, age was calculated based on the subject's age at original contact in 1984–1987. Nearly 40% of the study population was 60 years or older at the time of recontact (or death).

Contact Efforts

Of the 196 study subjects, 91 (46%) required one or two attempts to locate and/or obtain a completed interview, 59 (30%) required three or four attempts, and 46 (23%) required five or more attempts (Table I). The average number of contacts was 3.5; the maximum number of contact attempts was 15. A ''contact'' included any type of effort to locate the study subject (phone calls, home visits to the study subject, neighbor, family member, courthouse, public utility, etc.). The last known address and/or phone number for study subjects in combination with community

TABLE I. Effort Required to Trace Farmworkers From Starr County, Texas

	Frequency	Percent
Number of contacts		
Phone (range = 0–8)		
0	24	12
1–2	124	63
3–4	29	15
5+	19	10
Total	196	100
Out-of-office* (range = 0–11)		
0	66	34
1–2	88	45
3–4	29	15
5+	13	7
Total	196	100
Total contacts (range = 1–15)		
0	0	0
1–2	91	46
3–4	59	30
5+	46	23
Total	196	100
Time required		
<0.5 h	112	57
0.5–1.0 h	64	33
>1.0 h	20	10
Total	196	100

*Includes home or any other out-of-office contact.

contacts, inquiring at local neighborhood convenience stores, or checking with the local water department appeared to be the most helpful in successfully locating these farmworkers. Sixty-six subjects (33.7%) were contacted by phone attempts alone, 24 (12.2%) by out-of-the-office attempts alone, and the remaining 106 (54.1%) were contacted by a combination of both phone and out-of-office visits. Of the 177 interviews completed, 82 (46.3%) took place in the respondent's home and 95 (53.7%) by telephone. Of the 163 living traced subjects, 150 (92.0%) were still living in Starr County, 9 (5.5%) were living in Hidalgo County (the adjacent county to the east of Starr), 1 (0.6%) in Harris County, Texas, and 3 (1.8%) were living in other US states. Self-respondents were asked about their willingness to be contacted in the future; all indicated their willingness to be contacted.

Interviewers were asked to estimate the amount of time required to complete each contact. Individual contact times were accumulated for each subject (Table I). More than half of the study participants were located in less than $1\frac{1}{2}$ h, but the research team believed this to be an underestimate because it included communication time only, and not, for example, transportation time.

Overall Findings

Overall study results are provided in Table II. Of the original cohort of 196 migrant farmworkers, 163 were located and living (83.2%), 15 had died (7.6%), and 18 (9.2%) were unable to be located. Follow-up was successful for 93% of the male and 89% of the female farmworkers. Of the 178 completed interviews, 105 (59.3%) were self-respondents, 28 (15.8%) were spouses, and 44 (24.9%) were other family members. There was only one missing interview. (Although confirmed deceased by a neighbor, no relative or other secondary contact was available to complete this interview). The interview was conducted in English only for 19 (10.7%) of the questionnaires, Spanish only for 102 (57.9%), and in both English and Spanish for 51 (28.7%) of the questionnaires (language of interview was unknown in 2.8%).

Work Status

Of the 163 subjects who were living at the time of contact, 22% were currently employed in 1996 at the time of interview, nearly half were unemployed, 21% retired, and 9% disabled (Table III). A higher proportion of males (14.5%) than females (3.8%) was disabled. Of the 36 currently employed, 60% of the males (n = 12) and 12% of the females (n = 2) were currently working in agriculture, although more reported non-migrant work as compared to migrant. The most recent job for those unemployed was primarily migrant agriculture work.

Migrant Work and Migration Patterns

When subjects were asked the number of years since 1984 in which they migrated for at least some time during the year, 53 (29.9%) had not migrated. This group consisted mainly of the oldest study subjects. Twenty-one (11.9%) had migrated 1–3 years, 19 had migrated from 4–6 years, and 84 (47.5%) had migrated 7 or more of the past 12 years to 25 different states. This pattern held for both males and females. The top five states where subjects migrated to at least once included Texas (48.9%), California (33.9%), Washington (22.4%), Illinois (8.0%), and Michigan (5.7%). Approximately two-thirds of the study subjects reported migrating to only one state (Table IV). Subjects reported working with more than 40 different crops. The most frequently mentioned crops were cotton and melons (in Texas); grapes, asparagus, and potatoes (in Washington); onions (in Texas and California); beets, tomatoes, corn, and peaches (in multiple states).

TABLE II. Characteristics of Farmworkers From Starr County, Texas By Tracing and Vital Status

	Successful tracing		Not traced		
	Alive	Dead	Unknown	Total	Percent
Total	163	15	18	196	100.0
Age group*					
<30	12	—	3	15	7.7
30—39	29	—	1	30	15.3
40—49	35	1	5	41	20.9
50—59	29	2	2	33	16.8
60—69	31	4	5	40	20.4
70+	27	7	2	36	18.4
Unknown	—	1**	—	1	0.5
Gender					
Male	83	10	7	100	51.0
Female	80	5	11	96	49.0
Respondent					
Self	105	—	—	105	59.3†
Spouse	23	5	—	28	15.8
Other family	35	9	—	44	24.9
No interview	—	1**	18	19	—

*Age for "Unknown" vital status subjects calculated based on subjects' ages at original contact.
**Known deceased "about five years". Information provided by former neighbor.
†Percent of 177 completed interviews.

Description of Deaths

Fifteen subjects were determined to have died since first contacted approximately 10 years earlier. Ten (67%) were male; the median age of death was 72.5 years. A substantial effort was made to locate death certificates, and 9 of the 15 were found. Among the study subjects whose death certificates were located, seven were male (78%); median age of death was 68 years; year of death ranged from 1989–1995; median years of education was 4 years (education was missing on three certificates); five were born in Mexico (56%); and all were residents of Starr County. The usual occupation was listed as ''laborer'' for approximately half of these deaths (n = 5); the usual industry was listed as agriculture in 67% (n = 6) of the deaths. The underlying cause of death in seven of the nine deaths was cardiovascular disease.

DISCUSSION

Migrant farmworkers have been perceived by some as not to have a permanent or stable residence, and, therefore, to be a population that may be too difficult to trace for participation in epidemiologic studies. This study documented that this perception is not accurate for migrant farmworkers in Starr County, Texas. Although farmworkers may migrate throughout the year to work, they often have permanent homes to which they return annually. Our overall success was 91% in locating members of a sample of 100 male and 96 female migrant farmworkers identified from two earlier studies conducted in Starr County approximately 10 years earlier. This population was remarkably stable geographically and migrated primarily within Texas. Of the living subjects who were found, 98% were located in Starr or in adjacent Hidalgo County.

It is unclear why only 9 of the 15 death certificates could be found. The Texas Department of Health maintains death certificates both for those who die in Texas and for those whose county of residence is listed as Texas. Of the six death certificates not found, one reportedly died in Mexico, one had insufficient information on date of death (''died about 5 years ago''—a search across a number of years was performed). The remaining four deaths occurred in Starr (n = 1) or in adjacent Hidalgo County (n = 3). If the county of death information was correct, these certificates should have been filed in Texas. The source for the location of death information was spouse, brother-in-law, neighbor, and daughter. It has been suggested that perhaps these deaths actually occurred in Mexico.

Starr County is a small, close, stable community that had the necessary infrastructure (via Starr County Health Studies Office) to facilitate the conduct of the study. However, there was negligible contact with the vast majority of these study subjects during the intervening decade

TABLE III. Gender Distribution According to Work Status, Type of Work, (If Employed), and Most Recent Job (If Unemployed); Tracing Migrant Farmworkers in Starr County, Texas

	Male (%)	Female (%)	Total (%)
Work status			
Currently employed*	20 (24.1)	16 (20.0)	36 (22.1)
Unemployed	33 (39.8)	44 (55.0)	77 (47.2)
Retired	17 (20.5)	17 (21.2)	34 (20.9)
Disabled	12 (14.5)	3 (3.8)	15 (9.2)
Other**	1 (1.2)	—	1 (0.6)
Total	83	80	163
Current occupation (if employed)			
Agriculture	12 (60.0)	2 (12.5)	14 (38.9)
Migrant	4	2	6
Non-migrant	8	0	8
Elderly care	0 (0.0)	5 (31.2)	5 (13.9)
Other***	8 (40.0)	9 (56.3)	17 (47.2)
Total	20 (100.0)	16 (100.0)	36 (100.0)
Most recent occupation (if unemployed†)			
Agriculture	52 (83.9)	45 (70.3)	97 (77.0)
Migrant	40	37	77
Non-migrant	11	7	18
Unknown	1	1	2
Elderly care	0 (0.0)	2 (3.1)	2 (1.6)
Housewife	0 (0.0)	12 (18.8)	12 (9.5)
Other***	10 (16.1)	5 (7.8)	15 (11.9)
Total	62 (100.0)	64 (100.0)	126 (100.0)

*Includes one person who was employed part-time.
**In prison.
***"Other" includes construction, maintenance, clerk, janitor, driver, mechanic, teacher's aid, self-employed, etc.
†"Unemployed" includes unemployed, retired and disabled.

since their initial study participation. This population was extremely cooperative, with all of the self-responders indicating their willingness to be contacted again in the future. This is an ideal population for follow-up studies due to the high participation rates, remarkable stability, and the existing community and research infrastructure.

TABLE IV. Number of States to Which Farmworkers Migrated from Starr County, Texas

Number of states*	Number of subjects	Percent
1	114	65.5
2	41	23.6
3	12	6.9
4+	7	4.0
Total	174	100.0

*22 unknown.

The success in tracing these farmworkers in Starr County over a decade demonstrates the feasibility of studying this occupational group, one previously perceived to be problematic. In this study, the follow-up rate of 91% falls in the upper range of typical tracing rates of other occupational cohort studies of 85–95%. The loss to follow-up in some occupational cohorts has been greater in women and minority populations [Blair et al., 1990]. Prior to accessing the Social Security Administration in a classic cohort study of rubber workers, the follow-up status of only 43% of the female workers were known compared to nearly 70% of the males [Monson and Nakano, 1976]. Although the tracing rates were lower among women in this current study compared to men (89 vs. 93%), the overall rate of 91% is representative of an entirely Hispanic population. Further, the use of the most essential identifying piece of information in many occupational cohort studies, the social security number, was not utilized in this study. There is a perception among migrants that the social security number is linked to legal status or possible invasion of privacy by the government; therefore, social security number was not

solicited in this community of Mexican-American farmworkers. It has similarly never been obtained in any of the previous health studies conducted by the Starr County Health Studies Office. This suggests that the use of other traditional sources of vital status assessment, such as the National Death Index or investigative tracing companies, may permit successful follow-up of migrant farmworkers in other geographic areas, including those with a less stable population than that of Starr County.

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