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THE HEALTH OF MIGRANT FARM WORKERS

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Of the many articles in this issue, only this one focuses on a specific group of farm workers. The others are devoted to a particular health hazard or type of risk or to the regulatory and preventive environment of health in agriculture. Why are migrant farm workers special? Are they not, in fact, at risk of experiencing the same kinds of illnesses and injuries and disabilities as other farm workers? The simplest and probably most accurate answer is that they are, but more so. The "more so" is explained partly by the specific conditions encountered while migrating and partly by other factors associated with migration, such as ethnicity and socioeconomic status. This article will describe the special characteristics of the migrant population and how they are related to health hazards, health status, and health-seeking behavior. It will examine some of the more prominent health issues of this population while attempting to avoid repeating information provided by other authors. And it will address the potential for appropriate actions on the part of the health professions.

It should be acknowledged at the outset that this discussion is hindered by ignorance. We believe that migrant farm workers deserve special attention to their health needs, and anyone who has worked with them or in the vicinity of the fields and orchards and labor camps where they work and live knows that this is so. But most of the "hard facts" are yet to be gathered. Available data are often sparse, incomplete, or inconclusive. This condition of ignorance is itself a consequence of the migrant situation, which will be addressed later in this article.

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Health of Migrant Farm Workers

DEMOGRAPHICS

To begin with, no one really knows how many migrant farm workers there are, and how many family members there are, either nationally or regionally or by state. Different federal agencies even define "migrant" differently. For the purposes of this chapter, we use the Office of Migrant Health's definition: a migrant farm worker is "an individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the last 24 months and who establishes for the purpose of such employment a temporary abode."²⁹ A seasonal farm worker, on the other hand, also works cyclically but does not migrate. The federal Office of Migrant Health estimates that there are 3,000,000 migrant and seasonal farm workers and dependents in the U.S.,³⁰ of whom about 1,000,000 are migrants. Depending on which agency is doing the counting, estimates range from 317,000 to 1,500,000 migrants and dependents.²⁹ This uncertainty is one consequence of migrancy; you can't count people if you can't find them. And if you can't count them, then you can't undertake population-based research with much confidence in your denominator figures. For example, much has been made in the press of the assertion that the life expectancy of migrant farm workers is 49 years. A recent study tracked this statistic to undocumented congressional testimony in the 1960s and concluded, on the basis of indirect and incomplete but suggestive data, that the figure might be closer to 59 years.¹⁶ Such a discrepancy does nothing to lessen concern about the shortness of life but illustrates the demographic problem. The same concerns are raised about other vital statistics, such as infant mortality and early childhood deaths.^{3,4,27}

There are three major migrant "streams" in the United States. One includes the east coast, from a home base in Florida to the northern Atlantic states. The second originates in Texas and spreads throughout the plains states, middle west, and parts of the Rocky Mountains. The third, based in California and Arizona, covers the western states. The eastern stream is the most ethnically heterogeneous, including African Americans, Mexican Americans, Mexicans, Puerto Ricans, Haitians, Jamaicans, and others. The other two streams are over 90% Hispanic but also include American Indians and Southeast Asians.²⁹ Among the Hispanics there are Mexican Americans, Mexicans, and an increasing number of Central Americans. An unknown but large number of these workers are undocumented. Undocumented status has significant implications for health, which are discussed below.

One can see that migrant farm worker populations vary by race and ethnicity, geographic location, type of work performed, and degree of acculturation. From the Jamaican apple harvester in New England to the African American tobacco worker in North Carolina and the Mexican grape picker in California's central valley, migrants constitute a heterogeneous population with different exposures and reactions to health hazards.

THE MIGRANT CONDITION

The very geographic mobility and transience of migrants create health hazards. If motor vehicle accidents, for example, are a hazard to all farm workers, then one would expect the "more so" situation to apply here. But this transience leads to other serious health risks as well. Migration causes social and physical isolation of farm workers and their families, especially of wives who may not be working themselves. Recent interviews¹⁷ of migrant health center staffs in the western stream yielded the following typical picture: a migrant family arrives at a new site and finds employment and housing on or near a farm with a few other

migrants—the large migrant labor camp is the exception. There is no ongoing social network to provide emotional, social, or financial support. The husband leaves at dawn to work in the fields, leaving his family with no transportation to use for schools, shopping, or doctors' visits. The wife speaks no English and may be illiterate in Spanish. She may be fearful as well as depressed about her isolation. Access to health care is difficult at best. Continuity of care and adequate medical follow-up of her or her family are problematic. Specific health problems, such as alcoholism and other substance abuse, are associated with social isolation. For male workers migrating alone, the risk of contracting AIDS and other sexually transmitted diseases is increased. Thus, migrancy in itself exacerbates problems of access and may lead to behavioral problems associated with isolation.

Poverty is not unique to migrant farm workers, but, combined with migrancy, results in a degree of substandard living conditions that have been described as "third world."²³ The average family income of migrant farm workers from all sources was estimated at \$6,194 in 1985.²⁴ Of that, \$3,295 came specifically from farm labor. In 1981, a migrant family's income was estimated at only \$3,995 a year.²⁵ Housing is sometimes provided by the employer but is typically left to the worker to obtain on his own. The regulation of growers' labor camps is haphazard or nonexistent. As recently as May, 1990, Secretary of Labor Dole was "shocked" by what she saw on a surprise visit to a migrant labor camp in Florida.¹ Unfortunately, what she saw was typical of labor camps as well as of privately available migrant housing throughout the country.¹ Such housing is substandard on every count. It lacks insulation; there is often no indoor plumbing, no running water, no heat, and no electricity. Laundry facilities, which are important in reducing pesticide exposure, are nonexistent. For a minority of workers, California's agricultural counties offer an exception to the rule by providing county operated labor camps for up to 5 months of the year.

Yet, in California as elsewhere, one can also find migrant workers living under plastic sheets or in cardboard boxes in the fields and orchards where they work.¹ Whether living in the fields, in camps, or in privately obtained housing, migrant families are likely to eat and sleep in close proximity to the workplace. They are thus at risk of exposure to pesticide drift or direct accidental spraying in addition to any exposures suffered by working members of the family while at work. Because of the lack of adequate sanitation, water, and laundry facilities, the migrant family may have to use irrigation water for drinking, bathing, and washing clothes. This water is likely to be contaminated by both pesticides and fertilizer runoff. In the case of some crops, such as citrus, the irrigation water itself is used as the delivery vehicle for pesticides.

Child labor is a general problem in agriculture, and, again, this is more so for migrant farm workers, because their relative poverty makes them more dependent on the income of their children. Assuming that there is effective enforcement of child labor statutes (an unsafe assumption of a best-case scenario), it would still be possible for children as young as 10 to harvest potatoes and strawberries, and children of 12 may legally work in any crops. Dunbar and Kravitz¹⁰ estimated that 25% of all farm labor in the U.S. is performed by children.

The intermittency of work, fluctuation of wages based on the piece rate system of payment, and overall low level of income of migrant workers lead to long hours in the fields. The piece rate system also provides disincentives to seek health care. Every minute away from work, no matter the reason, is money lost. A clinic visit which, counting travel time, waiting time, and actual encounter, may

take several hours, can be a financial disaster to a migrant worker. I have been told by workers that even the quarter mile walk from the field to the portable toilets takes too much time away from work. Piece rate work also increases the pace of work and decreases the number and length of breaks for any reason.

Migrant workers also fear to leave work, even briefly, for health reasons, because they are easily replaceable by others willing to work hard for low wages under poor conditions. Those most willing to work include the undocumented, primarily Mexicans and Central Americans who have crossed the Mexican border illegally for economic or political reasons, or both. If migrant workers are more at risk than other agricultural workers, then the undocumented workers are even more at risk than other migrants. One could say that their greatest health hazard is the risk of being deported, because their legal jeopardy leads them to avoid any contacts that might lead to their apprehension, and this includes contacts with health care providers. They are also the most likely to be living in the fields. Undocumented workers thus live under more stress, in the worst living conditions, and with the least health care of all migrant workers.²⁹

Those workers who were once undocumented but are now enrolled in the amnesty program created by the Immigration Reform and Control Act of 1986 (IRCA) may also avoid health care because of the ambiguity of the regulations requiring amnesty participants to be unlikely to become a public charge. One test of the public charge rule is whether the applicant has received public cash assistance. While medical care is not considered to be such assistance, the Immigration and Naturalization Service (INS) refuses to make a blanket exemption, preferring to make decisions on a case by case basis. The effect of this policy, based on interviews in the western stream, has been to discourage workers from applying for Medicaid or any other publicly sponsored health care.⁶

Language and culture are important factors that exacerbate the health hazards to migrant farm workers. Of workers who are Hispanic, a majority of them speak only Spanish or are much more fluent in Spanish than in English. Smaller numbers of workers speak Haitian French, Creole dialects, or Southeast Asian languages. In all cases, a language and/or cultural difference between the worker and the surrounding culture creates barriers to care, increases social and physical isolation, makes health education more difficult, and increases the likelihood that nonmedical or "traditional" forms of care, such as "curanderos" (healers) or "brujas" (witches) will be used where available.¹¹ Language and cultural differences, coupled with the personal and family ties of many migrants to Mexico, also increase the likelihood that migrant workers will seek health care in Mexico, not in the U.S.¹⁷ Rather than seeking care in a timely manner, workers will wait until they can return to Mexico for care. And while American providers, especially those at migrant health centers, will provide workers with their medical records and interagency referral forms, Mexican providers do not do so.¹⁷ The result is that this major subgroup of migrant workers is very difficult to follow medically.

Lack of unionization, which is typical of farm workers in general and migrants in particular, has been noted as a contributing factor to health problems.²⁹ Where workers have been unionized, housing is better, field sanitation and water are better, health insurance is provided, and wages are higher. Another way of stating the issue is that migrant farm workers are probably the politically weakest occupational group in this country, the hardest to organize, and the most poorly represented. They have little political clout. As a consequence, the health

care provider may find him- or herself acting by default, but by necessity, as the advocate as well as the caregiver for migrant farm workers.

The condition of migrancy, then, affects health in many ways. It leads to increased exposure to unhealthy living and working conditions; to increased exposure to specific health hazards; to poor utilization of health care; to an overemphasis on acute care relative to routine or preventive care; and to lack of awareness, lack of availability, and lack of accessibility of care.

WHAT DO WE NOT KNOW ABOUT MIGRANT HEALTH?

Migrant farm workers suffer from the same leading causes of death as other Americans—heart disease, cancer, and strokes—but we know little or nothing about prevalence, incidence, or risk factors among migrants.²¹ We do know something about the most frequent diagnoses made at migrant health centers. Wilk²⁹ reports the following diagnoses in descending order of frequency, in 1979–80: acute upper respiratory infection, hypertension, obstetrical problems, diabetes mellitus, otitis media, dermatitis, trauma, urinary tract infection, anemia, obesity, gastroenteritis, family planning activities, and heart disease. In a 1986 study of one migrant health center in Arizona, injuries were the most common diagnosis, followed by hypertension, respiratory diseases, diabetes mellitus, digestive diseases (including dental caries), and mental disorders, primarily depression and anxiety.¹⁶ There were also differences in frequency between upstream and downstream (home base) clinics.²⁹ Among the upstream clinics, skin disorders were the most frequent diagnosis, whereas dermatitis was eighth in frequency at downstream clinics. Parasitic infections, which ranked ninth at upstream clinics, were too infrequent to rank at downstream clinics. These changes in frequency are likely related to changes in working and living conditions when migrant workers are “on the road.”

A recent review of the literature summarized questions regarding migrant health “to which we find virtually no answers in the peer-reviewed medical literature.”²⁴ Rust identified 40 distinct areas of ignorance, of which several have been mentioned above. Other major lacunae include the following: perinatal outcome data, including birthweight, congenital anomalies, and maternal morbidity/mortality; adequacy of prenatal care; prevalence of chronic diseases; incidence of cancers; pesticide exposure; injuries; dermatitis; obesity; malnutrition; tobacco and alcohol use; other substance abuse; risk factors for AIDS; suicide, homicide, and family violence; immunization status; utilization of cancer screening; delays in diagnosis or treatment, and so on.

Data on chronicity in general are lacking. Questions related to low-level, long-term pesticide exposure, occupationally related cancers, and musculoskeletal diseases or disabilities cannot, therefore, be answered with assurance. Wilk²⁹ enumerates several probable chronic problems caused by pesticide exposure alone, including dermatitis, fatigue, headaches, sleep disturbances, anxiety, disturbances of memory and concentration, cancer, birth defects, sterility, blood disorders, and abnormal liver and kidney function. Moreover, we cannot document illness due to the workplace environment as distinct from illness due to poverty.

Certainly one cause of our ignorance is the lack of provider training in “agrimedicine.” Lack of training results in misdiagnoses as well as missed opportunities to ask the relevant questions of patients as part of the history or during examination. For example, an emergency medical technician (EMT) attending an agrimedicine workshop organized by the author recounted an

incident in which his ambulance had been called to a field where a worker had collapsed. It was months later, during the workshop, that the EMT realized that the worker had exhibited all the symptoms of acute pesticide poisoning, which were somewhat similar to those of a myocardial infarction for which the EMT had provided first aid. There had never been any training in the recognition and treatment of pesticide poisoning provided to the emergency medical service crews in this agricultural community, nor had the physicians or nurses at the local migrant health center received any similar training. This issue is addressed further at the end of the chapter.

HAZARDS TO MOTHERS, CHILDREN, AND FETUSES

The field labor characteristically performed by migrant and seasonal farm workers presents a wide range of health hazards. In regard to chemical risk factors, a California study²⁹ found that children of farm workers were four times as likely to have limb defects as the nonfarm population, if both parents were farm workers. (Little as we know about maternal health effects, we know even less about reproductive effects on the male.) Uterine bleeding may be a response to chemical exposure.²⁹ Both the active and inert ingredients of pesticides may cross the placental barrier and have mutagenic, teratogenic, carcinogenic, or neurotoxic effects. Dehydration, a common risk for field workers, may decrease the effectiveness of the placental barrier and increase fetal exposure to contaminants. Pesticide-caused anemias may also interfere with a normal pregnancy. The effects of such exposures "may not manifest themselves until later in childhood, in adolescence, or even later."²⁹

Physiological changes associated with pregnancy may also increase health hazards. For example, changes in lung function increase the risk of inhalation-related illness. Musculoskeletal changes may increase the risk of falls and therefore of miscarriage and prematurity. Occupational fatigue in general—standing, load carrying, repetitive work—carries the risk of accident and injury. Urinary retention as the result of lack of field toilets may lead to urinary tract infections. Unsanitary work conditions can lead to fecal-oral contaminations and diarrhea, anemias, or malnutrition, and to viral infections that cause miscarriages, stillbirths, or congenital defects. Pregnancy itself, as a physiological stress, may trigger symptoms of previously asymptomatic conditions, such as pneumonitis.²⁹

Children are at risk both directly, as laborers themselves, and indirectly, as members of migrant families. Infants, for example, can be exposed to toxic agents in breast milk or by skin contact with the mother's skin or clothes. Children are at high risk of pesticide poisoning because of their low body weight, faster metabolism, and potentially long-term exposures. Elevated rates of brain tumors and leukemia have been noted among some migrant children.²⁹

The Department of Labor estimated that approximately 400,000 children, ages 8-15, worked in agriculture in 1981.²⁹ More recently, Pollack reported that 23,500 children a year suffer from nonfatal trauma in agriculture.²³ The Migrant Clinicians' Network estimated that 300 children a year die from work-related injuries in agriculture.¹⁹ These figures apply to all child farm labor and have not been broken down for migrant or seasonal farm workers.

PESTICIDES

As of 1985, there were more than 1,500 active ingredients used in more than 45,000 registered pesticide products on the U.S. market.⁷ In 1989, the Government

Accounting Office (GAO) reported to Congress that the Environmental Protection Agency (EPA) had not completed a final assessment of any of the 45,000 pesticide products sold in the U.S., but that they were close to completing three.³¹ In addition to the active ingredients, there are inert ingredients that may be highly toxic to humans, such as benzene, carbon tetrachloride, and others. Those are not listed on the warning label because they do not affect the target pest and are considered trade secrets. Rust concluded that the available epidemiological data on pesticide exposure, while poor, suggest links to limb-reduction birth defects, childhood leukemias and brain tumors, adult lymphomas, and lymphosarcomas.²² Other health problems not already mentioned include spontaneous abortion, sterility, menstrual dysfunction, immune system abnormalities, and various nervous system effects, including motor coordination, thought processes, anxiety, and depression.³¹

Several difficulties in documenting pesticide exposures should be noted. Lack of training of physicians and other medical personnel is negatively reinforced by the lack of a national reporting system for exposures, by the absence of information among farm workers and/or their inability to read labels on pesticide containers, by farm workers' ignorance of the specific pesticides being used in their vicinity, by the reluctance of farm workers to report pesticide poisonings, and by the use of providers in Mexico when they are accessible. Both California and Arizona requires physicians to report all cases of pesticide poisoning within 24 hours. Compliance is poor and, as of early 1990, this appeared to be due to a combination of ignorance of the requirement and resistance to regulation.²⁶

Another difficulty in documenting exposure and the effects of specific pesticides is that many different pesticides may be used on one crop in a short period of time. Apples, for example, are treated with a minimum of 12 to 16 chemicals between blooming and storage.¹² The pesticides being used change from year to year and vary from place to place as well as from crop to crop. There is a sort of "folklore" of pesticides among growers such that one grower may discover a particular pesticide to have been especially effective, and this information will be passed along informally, leading to the adoption of the same pesticide by other growers in the vicinity. The same crop, grown in another area, may be treated with different pesticides, depending on the local folklore, as well as manufacturers' recommendations. Thus, adequate documentation of pesticide exposures, requiring the identification of the specific pesticide, may depend on information that is site-specific, crop-specific, time-specific, and pesticide-distributor-specific.

Migrant farm workers are probably at greater risk than others of pesticide poisoning, both acute and chronic, for several reasons. They live close to—and some live in—the fields and therefore may be exposed outside of as well as during working hours. Poor sanitation and water facilities may lead to the use of contaminated water for washing, drinking, and laundering. Lack of laundry facilities may lead to contamination of all family members by clothing. The labor intensive crops with which migrants work also receive heavy pesticide application. Reentry periods—the time after application during which workers may not return to the field or orchard—vary by state and by federal EPA standards and are the subject of much controversy. For example, the EPA reentry interval for azinphos methyl is 24 hours. In California, the state-mandated interval for the same pesticide is 30 days for citrus, 21 days for grapes, and 14 days for peaches, nectarines, and apples.²⁹

Workers are exposed to pesticides in several ways. These include direct spraying, both aerial and ground; drift from aerial spraying or windy conditions

on the ground; contact with plants; eating or smoking with contaminated hands; eating the fruits or vegetables being harvested without washing them; drinking water from contaminated utensils; drinking, cooking, or bathing with contaminated water; using contaminated leaves as toilet paper; contaminating the genitals with unwashed hands; and wearing contaminated clothing rather than laundering it immediately upon leaving the fields.

We do not know the true pesticide-related mortality or morbidity among farm workers. For reasons already noted—lack of a population denominator, inaccessibility of the population, confounding variable, difficulty in measuring extent of exposure—it is more difficult to gather these data for migrants than for other categories of workers. Given these difficulties, the potential for prevention represented by EPA testing and regulations is all the more important for reducing the health hazards of pesticides.

CANCER

Another article in this issue contains a complete summary of cancer among farmers (p. 335). However, there are no reliable estimates of cancer mortality among migrant and seasonal farm workers.⁷ Case-control studies of stable farm populations reported elevated risks for leukemia, Hodgkin's disease, non-Hodgkin's lymphoma, multiple myeloma, and cancers of the lip, stomach, skin, prostate, testis, brain, and connective tissue. Other studies have linked cancers in children to farming and farm labor.²⁹ None of these studies focuses specifically on migrant workers.

Carcinogenic exposures may have multiple sources.²⁵ Chemical exposures could include pesticides, fertilizers, solvents, fuels, oil, and welding fumes. Zoonotic viruses and fungi are biological threats, and sunlight is a physiological source. Most attention has been given to the carcinogenicity of pesticides, but even here the data are skimpy. In 1988, the AMA's Council on Scientific Affairs reviewed 53 agricultural chemicals.⁶ It determined that two of the 53, arsenicals and vinyl chloride, were carcinogenic; that 13 were probably carcinogenic; and that 16 were possibly carcinogenic, making of a total of 31 suspect chemicals of the 53 reviewed.

The Council report called attention to the extreme frustration inherent in attempts to measure the effects of low level or prolonged exposure. With a latency of 15 to 30 years for chemically induced tumors, "no adverse effect may be apparent until long after the cancer-causing exposure has occurred."⁶ In the face of "only conjectural evidence at best that pesticides may be carcinogenic," the Council calls epidemiological studies in humans the "ideal choice."⁶ Again, migrants are at risk both because they are exposed to pesticides and because their exposures are the most difficult to document over time.

OTHER HAZARDS

Accidents, infectious diseases, dermatoses, allergic and respiratory conditions, musculoskeletal conditions, and behavioral health issues are covered elsewhere in this publication. Following the principle of "the same, but more so" regarding migrant farm workers, the reader interested in these hazards should consult the other articles in this issue. A few additional words are in order, however, regarding "stoop labor" and musculoskeletal conditions. The disability rate of migrant and seasonal farm workers may be three times that of the general population, much of it due to arthritis and chronic back injury.²⁹ Heavy physical labor may cause detectable spinal degeneration that develops up to 10 years prematurely.²⁸

The short-handled hoe was for many years the nemesis of the migrant farm worker, requiring the worker to bend low in order to cultivate row crops, allowing him to stand only briefly at the end of one row before beginning to work on the next. To stand at any other place in the field, or for any more than a very short time, made the worker easily spotted by the crew leader or foreman and put him at risk of harassment or firing.

The short-handled hoe is now banned in California, Arizona, Texas, and Washington. There is no national ban. Growers seem to have been convinced that longer hoes are as efficient as the short ones, and there are no recent documented reports of use of the latter. Stoop labor, however, continues to be very much a part of the migrant worker experience. The harvesting and packing of melons, cauliflower, broccoli, lettuce, strawberries, and other low-growing vegetables and fruits require low bending for long periods and lifting heavy loads from ground level onto trucks or conveyor belts. There have been no formal studies of the actual work performed by migrant farm workers; e.g., lifting and carrying heavy loads, emptying these loads into trucks, carrying heavy loads up and down ladders, and bending, all of which are likely to exact a heavy physical toll over time.

THE REGULATION OF MIGRANT LABOR

Farm workers are excluded from most labor laws. Only 30 states provide workers' compensation coverage to farm workers. An analysis of all 544 workers' compensation claims paid to Arizona farm workers in 1985 revealed that not one involved pesticide poisoning, even though the authors had considerable anecdotal evidence of such poisonings.¹⁵ The data did confirm the hazardous conditions of farm work due to the use of machines, knives and other tools, lifting of heavy objects, and working on ladders. The weakness of the workers' compensation program lies partly in worker and physician ignorance of the existence of the program, of how the process is initiated, or of how the injury is documented and reported. Growers with access to Mexico are known to have sent injured workers across the border for treatment in order to avoid reporting the injury.⁹

Farms with fewer than 10 employees are exempted from the requirements of the Occupational Safety and Health Act of 1970. Since 85% of migrant and seasonal farm workers work on just such farms, they are not protected by OSHA regulations. Similarly, the Field Sanitation Standard applies to employers of 11 or more. Current laws applying to employers and workers under the OSHA Hazard Communication Standard do not apply (as of 1990) to pesticide use by agricultural employers. In states whose field sanitation regulations do cover many migrants, standards such as the requirement that toilets be placed within one quarter mile of the work area are not as effective as they should be. Workers paid on a piece rate basis, as noted earlier, will avoid a quarter mile long walk as long as possible, whether it be to use a toilet or to drink potable water.

Since 1970, the EPA has had primary responsibility for overseeing and regulating pesticides. Other federal agencies, such as the Department of Agriculture, the Food and Drug Administration, OSHA, and the Consumer Product Safety Commission, are involved in controlling pesticide exposures. According to the AMA Council on Scientific Affairs, all these agencies are fairly consistent in setting permissible limits.⁶ Regulation is likely if a substance is expected to cause an increase of more than four cases per 1,000 persons, and it is highly unlikely if the expected increase is less than 1:1,000,000. However, between these limits,

cost-effectiveness rules: regulation is likely if the cost of regulation is less than \$2,000,000 per life saved.

Under current federal law, only commercial applicators must keep records of their use of restricted use pesticides. Most growers are not required to keep records of their pesticide usage. Eleven states require private applicators to keep some records. Large food processors and growers cooperatives also require records, e.g., Campbell Soup, Heinz, Gerber, Ocean Spray, Del Monte, Vlastic, and Diamond Fruit Growers. Despite the existence of regulations like these, their effect is weakened or even nullified by lax or nonexistent enforcement.²²

WHAT IS TO BE DONE?

Occupational and preventive medicine can respond in several ways to the challenges of migrant health. The ritual call for more research is only one of those, although this article should make clear that the need for documentation of migrant health status is genuine and urgent. There are other urgent needs as well. Education is indicated for at least three groups: health professionals, farm workers, and growers. Professional education on an inservice and continuing education basis would probably be more effective than injecting brief units, easily forgotten, into the formal curricula of undergraduate and graduate training institutions.

Most providers working in migrant health centers, for example, are family practitioners, pediatricians, or general internists who were originally assigned there by the National Health Service Corps or who decided to work there late in their formal training. Thus, the opportunities to provide relevant training are limited until the provider is actually on-site. Once on-site, however, the educational opportunities should be plentiful. Some migrant health centers provide a formal orientation to "agrimedicine" to their new providers. Content and length seem to be highly variable. There are many benefits to conducting such training on-site. Learning occurs at the point of need—it is immediately relevant. Different types of providers who actually must work cooperatively can be brought together for training, e.g., physicians, nurses, EMTs, and pharmacists. Local conditions can be incorporated into training: types of crops in the area, which determine the types of hazards; specific pesticides in use at the time; and, specific resources available in the area, such as a poison control center, county extension agents, and local and state health departments.

Between 1987 and 1990, two models of continuing education were tested in Arizona. One was centralized and specialized, offering a 4-hour seminar on pesticides to physicians in two urban locations. The seminar was presented by a toxicologist. Turnout in both locations was meager.¹⁴ The other model was decentralized and general, offering a 3-hour agrimedicine workshop on several aspects of farm worker health, with emphasis on pesticides, to a mixed group of providers at several rural locations. Presenters included a family physician with clinical experience in migrant health, the state pesticide coordinator, and the regional director of an insurance company that provides health insurance for migrant workers. The latter model was effective educationally but required considerable manpower resources to plan and conduct. In 1991, the state pesticide coordinator's office will conduct at least one regional pesticide workshop for health professionals.

Because the physicians who actually treat migrant workers are unlikely to be well trained in occupational health, they would benefit from having an occupationally relevant medical history form to guide them. Such a form, the (Arizona)

Farmworker Health History, was developed in both English and Spanish versions. Designed to be completed by the patient, if possible with assistance from clinic staff, the history attempts to elicit information regarding pesticide exposure and other occupationally related health problems over the previous 5 years. The form is then reviewed by the examining physician, who has the opportunity to followup with questions and a more detailed examination, if indicated (see Appendix D).

Growers, too, could benefit from health education. They are insulated in many ways from their workers. Frequently, the grower is not even the legal employer. Instead, a labor contractor, or *contratista*, is contracted by the grower to hire the field workers, who then become the contractor's employees. Nevertheless, it is the grower who ultimately determines working conditions, pesticide use, wages, and health benefits. Growers may be ignorant, either innocently or willfully, of just how bad the workers' living and working conditions are, or of how these conditions affect workers' health. County extension agents, who work closely with growers, could provide agricultural health education along with the latest information on seeds and fertilizers. Occupational health specialists could provide much needed information and training to the staffs of cooperative extension services in all states with land grant institutions.

Education for farm workers is clearly indicated, and here the challenge is great. Some of the conditions of migrancy that make it difficult to provide health care—transience, physical and social isolation, language and cultural differences—also increase the difficulty of providing effective education. A community-based program, utilizing lay educators, informal teaching, and various forms of outreach, might well succeed. Such a program would recruit farm workers and train them to deliver agricultural and general health education. They in turn would recruit other farm workers to attend short classes just before or just after the work day, or would provide information to workers while in the fields or in buses on the way to the fields. This model—"Su Salud Vale Mucho" (Your Health is Worth a Lot)—is derived from a successful prenatal outreach and education program that also targets farm worker families.¹⁸ Such a program would provide occupational and preventive medicine specialists, as well as other health professionals, the important role of "training the trainers." As uninformed as researchers and health professionals still are about migrant health, they have much skill, knowledge, and experience that could benefit the migrant population. The recommendations made here are intended to make the professional reservoirs of knowledge more accessible and more useful to those who need it the most, the people who live and work in the fields.

APPENDIX I

The Arizona Farmworker Health History

Historial Medico del Trabajador Agricola en Arizona

University of Arizona, Rural Health Office

Please answer all questions as fully as possible. If a question does not apply to you, leave it blank. The information you provide us will be used for medical and research purposes only. Your name will be kept strictly confidential.

- | | |
|---|---|
| 1. Mother | 2. Father |
| (1) Is your mother living? Yes ___ No ___ | (1) Is your father living? Yes ___ No ___ |
| (2) If she is living, how old is she? _____ | (2) If he is living, how old is he? _____ |
| (3) If she is dead, how old was she at death? _____ | (3) If he is dead, how old was he at death? _____ |
| (4) What caused her death? _____ | (4) What caused his death? _____ |
| (5) Did she ever work in agriculture? _____ | (5) Did he ever work in agriculture? _____ |
| (6) How long? _____ | (6) How long? _____ |
3. Please answer these questions about your children
- | | |
|--|--|
| (1) Were there any miscarriages? Yes ___ No ___ | (3) Was any child born prematurely? Yes ___ No ___ |
| (2) Was any child born dead? Yes ___ No ___ | (4) Did any child die at birth? Yes ___ No ___ |
| (5) Was any child born with a birth defect? Yes ___ No ___ | |

Explain any yes answer _____

4. Where do you work now? _____
5. How long have you worked there? Years _____ Months _____
6. If retired, what kind of work did you do before you retired? _____
7. (1) Do you live in a camp provided by your employer? Yes ___ No ___
 (2) Do you live in an apartment or house? Yes ___ No ___
 (3) Do you have other housing? Yes ___ No ___
8. How do you get to and from your work? _____
9. Describe what you do on your job: _____
- _____
10. (1) In the past five years, have you been around chemicals or pesticides on your job? Yes ___ No ___
 (2) Have you had any training on the dangers of pesticides and how to handle them properly?
 Yes ___ No ___
 (3) Check any protection equipment you use on the job:
 Gloves ___ Mask ___ Special suit over clothes ___
 Goggles ___ Rubber boots ___ Head covering ___
 Hearing protection ___
 Other: _____
- (4) In the past five years, have you been exposed to any of the following?
 Pesticides ___ High noise levels ___ Fumes and dust ___
 Vibration ___ Excess heat or cold ___ Emotional stress ___
 Other: _____
11. (1) In the past five years, have you carried or lifted heavy objects as part of your job? Yes ___ No ___
 (2) Do you have back problems? Yes ___ No ___ If yes, explain _____
- _____

If you HAVE Worked in Farmwork in the Last Five Years, PLEASE CONTINUE ON: IF NOT, STOP HERE.

12. If you have worked on any of these types of farms in the last five years, check the ones you have worked on:
 Vegetable or truck farm Fruit orchard Cotton farm
 Grain farm Animal or dairy farm Poultry
 Other _____
13. In the past five years, have you used the short-handled hoe? Yes No
 Do you currently use the short-handled hoe? Yes No
14. In the past five years, have you had any skin rashes or other skin problems? Yes No
15. In the past five years, have you had any allergies such as asthma or other respiratory problems?
 Yes No
16. At work, where does the water you use for washing your hands come from? Is it:
 Brought to the fields from home From a well in the fields
 Irrigation water at the fields From some other source
 Don't know
17. At work, where does your drinking water come from? Is it:
 Brought to the fields from home From a well in the fields
 Irrigation water at the fields From some other source
 Don't know
18. Are there toilets near where you work? Yes No
 If yes, are they close enough for you? Yes No
19. Is there any particular hazard or part of your job that you think has caused your health problems?
 Yes No
 If yes, explain: _____
20. Have you ever been injured at work? Yes No
 If yes, explain: _____
21. In the past five years, what different kinds of work have you done? (For example: weeding lettuce, packing melons, cutting broccoli.)

22. Add anything else you want to tell us: _____

THANK YOU FOR YOUR COOPERATION

-- FOR OFFICE USE ONLY --		Date: _____	Site ID No.: _____
Patient: Family ID No.: _____			
Chief Complaint: 1. _____		Treatment: 1. _____	
2. _____		2. _____	
3. _____		3. _____	
Assessment: 1. _____			
2. _____			
3. _____			

HISTORIAL MEDICO DEL TRABAJADOR AGRICOLA EN ARIZONA

Universidad de Arizona. Oficina de Salud Rural

Por favor, conteste las siguientes preguntas tan completo como le sea posible. Si alguna de las preguntas no aplica a usted, deje el espacio en blanco. La información que usted está dando será usada con el único fin de investigación medica y científica. Su nombre será estrictamente confidencial.

- | | |
|---|---|
| 1. Madre | 2. Padre |
| (1) ¿Vive su madre? Si ___ No ___ | (1) ¿Vive su padre? Si ___ No ___ |
| (2) ¿Si vive su madre, que edad tiene? _____ | (2) ¿Si vive su padre, que edad tiene? _____ |
| (3) ¿Si esta muerta, a que edad murió? _____ | (3) ¿Si esta muerto, a que edad murió? _____ |
| (4) ¿Cuál fue la causa de su muerte? _____ | (4) ¿Cuál fue la causa de su muerte? _____ |
| (5) ¿Trabajó alguna vez en la agricultura?
Si ___ No ___ | (5) ¿Trabajó alguna vez en la agricultura?
Si ___ No ___ |
| (6) ¿Por cuánto tiempo? _____ | (6) ¿Por cuánto tiempo? _____ |

3. Por favor, conteste las siguientes preguntas sobre sus hijos.

- | | |
|---|---|
| (1) ¿Hubo algun mal parto (aborto)? Si ___ No ___ | (4) ¿Murió durante el nacimiento algun hijo?
Si ___ No ___ |
| (2) ¿Nació muerta algun hijo? Si ___ No ___ | (5) ¿Nació alguno de sus hijos con un defecto?
Si ___ No ___ |
| (3) ¿Nació prematuro algun hijo? Si ___ No ___ | |

Si es así, explique: _____

4. ¿Actualmente dónde trabaja? _____

5. ¿Cuánto tiempo tiene trabajando allí? Años _____ Meses _____

6. Si esta jubilado, ¿en que trabajaba antes de jubilarse? _____

(1) ¿Vive usted en alojamiento del dueño del campo? Si ___ No ___

(2) ¿Vive usted en apartamento o casa? Si ___ No ___

(3) ¿Vive usted en otra clase de vivienda? Si ___ No ___

8. ¿Qué medio de transporta usa para ir y venir de su trabajo? _____

9. ¿Qué hace en su trabajo? _____

10. (1) ¿En los últimos cinco años ha tenido contacto con productos químicos o insecticidas en su trabajo? Si ___ No ___

(2) ¿Ha tenido entrenamiento acerca de los peligros y el manejo de los insecticidas? Si ___ No ___

(3) Indique que equipo de seguridad usa en su trabajo:

Guantes ___ Máscara ___ Traje especial sobre la ropa ___

Botas de hule ___ Cubierta para la cabeza ___ Espejuelos/gafas protectoras ___

Proteccion para los oidos ___

Otro _____

(4) En los últimos cinco años ha estado expuesto a cualquiera de los siguientes:

Insecticidas ___ Altos niveles de ruido ___ Vapores/gases y polvo ___

Vibraciones ___ Temperaturas extremamente altas o bajas ___ Tensión emocional ___

Otro _____

11. (1) ¿En los últimos cinco años ha levantando or cargado objetos/cosas pesadas en su trabajo?
Si ___ No ___

(2) ¿Tiene problemas de la espalda? Si ___ No ___ Si es así, explique _____

Si usted ha trabajado en el campo en los últimos cinco años favor de continuar; si no, no conteste las siguientes preguntas.

12. Indique si en los últimos cinco años ha trabajado en cualquiera de los siguientes:
- | | |
|---|-----------------------------|
| Finca de vegetales/verduras or camiones ___ | Huerta de fruta ___ |
| Finca de animales or lechería ___ | Finca de algodón ___ |
| Finca de grano/cereal ___ | Finca de aves de corral ___ |
| Otro _____ | |
13. ¿En los últimos cinco años ha usado "el cortito?" Sí ___ No ___
 ¿Actualmente, usa "el cortito?" Sí ___ No ___
14. ¿En los últimos años has tenido erupciones en la piel u otros problemas en la piel? Sí ___ No ___
15. ¿En los últimos cinco años ha tenido problemas alérgicos tales como asma u otra clase de problemas respiratorios? Sí ___ No ___
16. Cuando está trabajando, ¿de dónde viene el agua que use para lavarse las manos? Es:
- | | |
|--|-------------------------------------|
| Traída de los campos desde la casa ___ | De una noria/pozo en los campos ___ |
| Agua de riego en los campos ___ | De alguna otra fuente ___ |
| | No sabe ___ |
17. Cuando está trabajando, ¿de dónde viene el agua que tome? Es:
- | | |
|--|-------------------------------------|
| Traída de los campos desde la casa ___ | De una noria/pozo en los campos ___ |
| Agua de riego en los campos ___ | De alguna otra fuente ___ |
| | No sabe ___ |
18. Hay baños/excusados cerca de su trabajo? Sí ___ No ___
 Si es así, están bastante cerca de usted? Sí ___ No ___
19. Hay algún riesgo o parte de su trabajo que puede ser la causa de sus problemas de salud?
 Sí ___ No ___
 Si es así, explique _____
20. Se ha lastimado en el trabajo? Sí ___ No ___
 Si es así, explique _____
21. En los últimos cinco años, que trabajos ha desempeñado? (Por ejemplo: deshierbando lechuga, empacando melones or cortando brocoli.)

22. Alguna otra cosa que le gustaría mencionar:

Muchas Gracias Para Su Cooperación

- FOR OFFICE USE ONLY -		Date: _____	Site ID No.: _____
Patient/Family ID No.: _____			
Chief Complaint: 1. _____		Treatment: 1. _____	
2. _____		2. _____	
3. _____		3. _____	
Assessment: 1. _____			
2. _____			
3. _____			

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