



# Eye on Farmworker Health:

## Current Developments in Research and Policy

Welcome to Farmworker Justice's electronic newsletter covering recent developments in health-related research and policy relevant to migrant farmworkers in the US. This newsletter is available at <http://www.farmworkerjustice.org/resources-publications/occupational-health-safety>.

### Prenatal Care Disparities and the Migrant Farmworker Community

Bircher H (2009). *The American Journal of Maternal Child Nursing* 34(5):303-7.

Approximately one quarter of migrant farmworkers in the US are female, and a large percentage of these are of childbearing age. Pregnant farmworkers are at increased risk for spontaneous abortion, pre-term labor, and fetal abnormalities as a consequence of exhausting prolonged manual labor, periodic dehydration and exposure to pesticides, as well as substandard living conditions, poor health, and malnutrition. Twenty-five percent of births to migrant farmworkers result in insufficient birth weight, pre-term labor or other undesirable outcomes. Despite this increased risk, the majority of pregnant farmworkers receive inadequate prenatal care.

Poverty, lack of work authorization, geographical isolation, lack of knowledge concerning prenatal care recommendations, poor English skills, long work hours and migratory lifestyle all contribute barriers to prenatal health care access for migrant farmworkers. Over 60% of migrant farmworkers live at or below poverty level. Over 57% lack legal authorization to work in the US, making them ineligible for health benefits. Eighty-five percent of migrants working in the US have no form of health insurance. Only 5% are enrolled in Medicaid, although more than this number would be eligible. Language and literacy barriers as well as frequent migrations contribute to this under-enrollment. The result of these barriers is that 30% of pregnant farmworkers have their first prenatal visit when they have already reached the second trimester and 14% have no prenatal care until the third trimester. Less than half of pregnant farmworkers gain the recommended weight gain during pregnancy.

Nurse Practitioners are particularly well-suited to provide prenatal care to farmworkers. They are cost-efficient (costing an average of 20% less than physicians) and are educated to give attention to family, environmental, social, cultural and occupational factors when planning care. Nurse Practitioners are also strongly oriented towards providing health education. Mobile Health Clinics staffed with Nurse Practitioners who have access to outreach workers and interpreters, as well as to centralized health record databases to allow continuation of care despite migration, could help reduce a number of the barriers impeding proper prenatal care in farmworkers.

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## Cholinesterase Depression and Its Association with Pesticide Exposure across the Agricultural Season among Latino Farmworkers in North Carolina

Quandt SA, Chen H, Grzywacz JG, Vallejos QM, Galvan L, Arcury TA (2010). *Environmental Health Perspectives* 118 (5): 635 – 639.

The organophosphate class of pesticides is the most widely used in agriculture, and chronic exposure to organophosphates represents a significant health risk for farmworkers. Assessment of pesticide exposure in farmworkers typically relies on assays of the pesticides or their metabolites in urine. This method is limited in that it requires knowledge of which specific pesticides the farmworkers have been exposed to. Furthermore, assays for some commonly-used organophosphates are not available in most laboratories. An alternative strategy to assess organophosphate pesticide exposure is to assay the activity of cholinesterase enzymes present in the blood. Organophosphate pesticides, which act by inhibiting acetylcholinesterase, also bind irreversibly to cholinesterase enzymes on red blood cells, inhibiting their function and thus depressing blood cholinesterase activity until new red blood cells are formed. Cholinesterase depression has been successfully used to detect organophosphate exposure in workers directly handling high concentrations of pesticides. The aim of this study was to evaluate the usefulness of cholinesterase depression assays for assessing the chronic lower-level organophosphate exposure which can occur in workers performing routine farmwork, as well as to gain insight into the effectiveness of current measures to protect farmworkers from pesticide exposure.

Participants in this study were 231 Latino farmworkers working in 44 different work camps in North Carolina in the Spring and Summer of 2007. At each of 4 sessions, occurring in May, June, July, and August, the participants contributed a blood sample for measurement of cholinesterase activity and a urine sample for measurement of pesticide metabolites, and were interviewed regarding their pesticide exposure risk factors and work conditions. While there was substantial variability among the participants in the patterns of month-to-month changes in cholinesterase activity, mean cholinesterase activity was highest in August and lowest in June. The changes in cholinesterase activity levels between July and June, and between August and all other months tested were statistically significant. Nearly half of the participants had their peak cholinesterase activity in August. Cholinesterase depression was defined as a 15% or more reduction in cholinesterase activity from the individual's maximum level. More than half of the participants had cholinesterase depression in the month of June, and only 14% were cholinesterase depressed in August.

Month-to-month reductions in cholinesterase activity were found to be correlated with increases over the same time period in the number of organophosphate pesticides to which the farmworkers were exposed, as evidenced by the detection of the metabolites of these pesticides in the farmworkers' urine. Furthermore, the seasonal pattern of cholinesterase

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activity observed (lowest in June, highest in August) corresponds with the pattern of pesticide use. For the major crops handled by farmworkers participating in this study (tobacco, sweet potatoes, cucumbers) most insecticides are applied during the Spring and early Summer; harvest occurs in late Summer and is preceded by a mandatory several-week stop in pesticide use. These relationships support the validity of using depressions in cholinesterase activity as an indicator of organophosphate pesticide exposure.

EPA's Worker Protection Standard mandates pesticide safety training for all workers and handlers that will be exposed to pesticides. However, this study indicates that farmworkers are being overexposed to pesticides, despite the mandatory training. Greater enforcement of regulations, improved training, and monitoring of pesticide exposure are needed.

## Legislative and Regulatory Update: Farmworker Immigration Law

*Adrienne DerVartanian, JD, Farmworker Justice*

Immigration reform continues to be a critical need for our nation's farmworkers, the majority of whom are undocumented. The Agricultural Job Opportunities, Benefits and Security Act (AgJOBS), is a proposed immigration law that would address this need by providing agricultural employers with a stable, legal labor force while protecting farmworkers from exploitative working conditions. AgJOBS, a bipartisan bill, represents a major compromise between farmworker advocates (led by the United Farm Workers) and major agricultural employers to address the agricultural immigration crisis. If enacted, AgJOBS would (1) create an "earned adjustment" program, allowing many undocumented farmworkers and agricultural guestworkers to obtain temporary immigration status based on past work experience with the possibility of becoming permanent residents through continued agricultural work, and (2) would revise the existing agricultural guestworker program, the H-2A temporary foreign agricultural worker program.

On May 14, 2009, Senator Feinstein (D-California) and Representatives Berman (D-California) and Putnam (R-Florida) introduced AgJOBS in the Senate (S. 1038) and House of Representatives (H.R. 2414). AgJOBS is also part of the push for comprehensive immigration reform. AgJOBS is included in the House Comprehensive Immigration Reform bill, CIR ASAP, introduced by Rep. Luis Gutierrez (D-Ill.) and will likely be included in any comprehensive immigration reform bill that is introduced in the Senate.

The H-2A agricultural guestworker program has been the subject of much attention recently. On February 12, 2010, the Labor Department announced new regulations for the H-2A program that would largely undo changes to the program made by the outgoing Bush Administration over a year ago. The new

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rules took effect on March 15. Changes to the formula for calculating the adverse effect wage rate, the recruitment requirements, the transportation reimbursement provisions, the preoccupancy inspection of farmworker housing, and other provisions have been restored to the regulations that existed prior to the Bush Administration's changes. In addition, the new regulations add provisions such as a surety bond for farm labor contractors, disclosure of job terms to guestworkers by the time they apply for a visa, online posting of H-2A applications so that US workers can learn about jobs; and a requirement that H-2A labor contractors specify each specific location where work will be performed, the name of the grower and the period of work.

## Working to Eat: Vulnerability, Food Insecurity, and Obesity Among Migrant and Seasonal Farmworker Families

Borre K, Ertle L, Graff M(2010). *American Journal of Industrial Medicine* 53: 443 – 46 2.

The poverty and lifestyle of migrant and seasonal farmworkers (MSFWs) expose them to food insecurity. Despite this, and despite the physical exertion inherent in their work, a growing number of MSFWs are overweight or obese, putting them at risk for injuries and chronic illness that can interfere with their ability to work, thus further aggravating their food insecurity. This study explores food insecurity and obesity issues in MSFWs with the goal of identifying strategies to improve farmworker health.

Thirty-six Latino MSFWs who worked from June to November 2005 in eastern North Carolina and who had children who attended the East Coast Migrant Head Start Program completed a USDA Food Security Survey which classified respondents as food secure, food insecure without hunger (food available but lacking sufficient variety to meet nutritional needs) or food insecure with hunger (lack of regular access to sufficient food to prevent stomach pain and desire to eat). Sixty-four percent of the participating families experienced food insecurity and of the food insecure, 34% experienced food insecurity with hunger.

Participants listed all foods (and their quantities) consumed in the previous 24 hours. The nutrient value of this single day of food was calculated to offer an approximation of daily nutrient intake. Mothers also referred all food given to their preschool age children, who in addition to this food received at home, also received 2 meals each day from the Head Start Program. Calorie intake of food secure MSFWs was very close to the Recommended Daily Allowance (RDA). Farmworkers who resulted food insecure with hunger by the USDA survey had a lower total calorie intake, lower intake of calories from carbohydrates, and lower intake of fiber, folate, and calcium with respect to food secure farmworkers. Also, those food insecure without hunger tended to have a lower intake of calories and various nutrients, in particular Vitamin E. Children in food insecure farmworker families received while at home lower intakes of calories

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from fat and protein, less Vitamin A and calcium, as well as lower amounts of omega-3 fatty acids and cholesterol (both needed for brain development and growth) with respect to children in the food secure families. This underlies the importance of the Head Start Program- supplied meals for children.

Participants also reconstructed a dietary history detailing how their immigration to the U.S. and assumption of the MSFW lifestyle changed their eating habits. Common changes included increases in eating meats and processed foods, drinking sodas, and snacking, and decreases in the quantity and variety of vegetables and fruits eaten. These changes were dictated by food access, availability and cost, time limitations, and living and work conditions. Meals from meats were easy to prepare quickly, an important factor for farmworkers who had little time and energy after long, exhausting work days. MSFWs were dependent on crew leaders for access to retail stores as they did not have their own transportation. Long times between grocery trips combined with inadequate home refrigerators resulted in fresh food spoilage, leading to a reliance on non-perishable processed foods. The lack of time farmworkers had for preparing food reinforced this tendency, and the lack of time they had to eat while working in the fields, together with the lack of safe clean food preparation and storage areas in the kitchens of grower-provided homes, encouraged the purchase of individually-wrapped snack-type foods. Supermarket vegetables were expensive, and not always fresh. Produce harvested by the farmworkers was not typically sold directly on the farms, and no inexpensive markets of local fresh produce were available near farmworkers' homes. While some growers did occasionally offer blemished or surplus produce to farmworkers, this did not provide the variety necessary for proper nutrition. Thus, food insecurity of MSFWs in the U.S. has complex causes, and occurs not only in periods of scarce work availability or when important bills or the need to relocate to a new job leave insufficient funds to buy food, but also as a result of lack of transportation, inadequate housing, and working conditions that lead to lack of control.

All MSFWs expressed concern about overweight and obesity in themselves and their children. Some of the participants were weighed and measured in order to obtain an objective measure of obesity through calculation of the Body Mass Index (BMI). The measurements confirmed that overweight was prevalent among MSFWs. In all 3 food security groups, median BMI was around 27, an indication of overweight. Among the children of MSFW, obesity was present both in those from food secure and food insecure families, but more of the food secure children were obese (73% vs. 30%) and their obesity was more severe (median BMI 97.5 vs. 65.5). The reasons for the overweight and obesity in MSFWs and their families are not clear. Other studies have pointed out a disproportionate amount of obesity and disease in poor populations. Stress associated with high-demand, low control work environments has been associated with obesity. Studies in animals have found that exposure to pesticides can interfere with metabolism and lead to obesity and diabetes.

MSFWs seek to cope with the ever-present risk of food insecurity by budgeting, sharing housing, seeking out and sharing transportation to low cost food markets, participating in available assistance programs and services such as the Migrant

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Head Start Program and Women, Infants and Children's Supplemental Food Program, and accessing emergency foods provided by local churches and food banks. But while many of the factors which lead to food insecurity are out of the control of farmworkers, there is much that growers and the community can do. Some useful changes within the work environment could include instituting mandatory break periods to allow farmworkers to eat, providing workers in the field with washed fresh fruit and vegetables and safe food storage areas, or providing a hot communal meal in the workplace. Growers could also increase the access of farmworkers to vegetables and fruits by selling them directly on the farm or in produce stands or mobile markets near MSFW housing. Also the housing conditions of MSFWs are under the control of growers. Grower-provided housing should have working appliances and food storage areas that keep food clean. Local churches and community services can help by organizing delivery of emergency food to sites easily accessible by MSFWs, and providing emergency transportation to markets. Local governments could reduce MSFW transportation problems by instituting bus and ride sharing services for use by all vulnerable populations in rural areas.

## Hand Problems in Migrant Farmworkers

*Shah DJ, Shipp EM, Cooper, Huber JC, del Junco DJ, Rene AA, Moore JS. Journal of Agricultural Safety and Health 15(2): 157-169.*

Farmworkers perform jobs that are often physically taxing and can lead to both short and long term injuries. One such injury is the development of musculoskeletal disorders (MSDs) of the hand, which, along with MSDs of the arm, shoulder, and back, may constitute the most common health problem facing farmworkers. These injuries, often referred to as MSDs of the upper extremities, are acknowledged as causing the longest absences from work, and are especially economically damaging for migrant farmworkers, many of whom often already face low wages and unstable employment. Additionally, many of the risk factors for MSDs of the upper extremities, such as repetitiveness, forcefulness, using a pinch grasp, and awkward posture are inherent in the work that farmworkers perform. Farmworkers also often work long hours at a fast pace, allowing little time for minor injuries to heal, which can cause chronic conditions.

This study explores the frequency, duration, and possible causes of MSDs of the hand in migrant farmworkers in Starr County, TX and makes recommendations for future research. The study itself is based on two years of interviews with 180 families that took place as part of a study entitled "Injury and Illness Surveillance in Migrant Farmworkers (MANOS)," which gathered data on acute, nonfatal work-related injuries. The interviews took place in workers' homes, away from their employers. The study only included families, and only mothers were interviewed. They answered questions about their own health and the health of their husbands and children. A total of 390 workers were included in the study, 29% of whom reported hand pain in year one of the study, and 17.8% of whom reported hand pain in year two.

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Statistical analysis performed on the data gathered from interviews examined the role of several work and non-work related factors. Non-work related factors that were found to be related to an increased prevalence of hand pain included increased age, female gender, lack of a good night's sleep, and working in both years of the study. Work related factors found to be related to an increased prevalence of hand pain included working an average of more than eleven hours a day, moving heavy objects, working with handheld vibrating tools, and working in a job involving meat processing. While no single factor can be pointed to as a definitive cause of hand pain among farmworkers, the study demonstrates that the interaction between migrant farmworkers' jobs and the lifestyle that they lead as a result of their jobs is key. The role of sleep in healing and the question of whether a lack of sleep prevents tissue from healing or whether the presence of pain prevents sleep is pointed to as a question deserving more research. Hand pain in youths is another topic highlighted as needing further study.

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***Eye on Farmworker Health: Current Developments in Research and Policy*** is an electronic newsletter covering important recent developments in research and regulation on issues affecting the health and safety of migrant farmworkers. It is a joint project of Farmworker Justice and Migrant Clinicians Network, supported by the Health Resources and Services Administration's Bureau of Primary Health Care. Each issue includes summaries of recent articles and reports, as well as recommendations for using the information to help health professionals, outreach workers, *promotores de salud*, and advocates strengthen their efforts on behalf of farmworkers and their families.

*The contents of this publication are solely the responsibility of Farmworker Justice and Migrant Clinicians Network and do not necessarily reflect the official views of the Bureau of Primary Health Care or the Health Resources and Services Administration.*

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