Migratory and seasonal agricultural workers fill the labor needs of United States farmers. Although migrant workers are a culturally and ethnically diverse population, presently, they are predominantly immigrants of Hispanic ethnicity. Migrant farm workers are increasingly young, financially impoverished, male, undocumented immigrants from Mexico. Families with children constitute 45% of this population. The ecological context of migrant children's lives is characterized by poverty, social isolation, heightened inter- and intra-national mobility, limited protections from occupational safety and health legislation, and health access barriers. Moreover, the linkage of citizenship and immigration status to the receipt of public insurance and selected social services benefits has the potential to increase access barriers for migrant workers and their families. Despite these obvious vulnerabilities, few health services research studies address this population. Most of what is known relates to adults, with very little known about migrant children's health services utilization patterns or health morbidities. In the emergency department setting, the differential approach required to care for children, as compared to adults, must be modified further in order to address the unique needs of this vulnerable population. The effective delivery of acute care to the children of migratory agricultural workers requires awareness of and attention to their unique health access barriers, issues of continuity and compliance with care, and their unique health and injury risks.
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Children of Migratory Agricultural Workers: The Ecological Context of Acute Care for A Mobile Population of Immigrant Children

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THE UNITED STATES EMPLOYS MIGRATORY workers to harvest the nation's agricultural crops. The impact of this labor force is evident from the fact that during the last decade, over 85% of the fruits and vegetables in the United States were cultivated and/or harvested by hand.[1] Moreover, explosive growth in the production of labor-intensive crops has resulted from increased global demand for fresh fruits and vegetables, as well as from technological advances in the storage and transport of agricultural commodities.[2] Despite these changes, successive generations of migratory agricultural workers have experienced the constants of poverty, social isolation, cyclical mobility, and health services access barriers.[3,4] As a result, migrant farm workers and their families remain marginalized and among the most socially, economically, and medically vulnerable populations in the United States.

Presently as well as historically, immigrants have had a key role filling the United States's agricultural labor needs. Prior to the Civil War, the seasonal demand for southern agricultural laborers was met by forced and enslaved immigrants from Africa, as well as by their descendants.[5] As early as the 1850s, agricul-

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tural labor needs across the United States were met by Finnish, Italian, Chinese, Japanese, and Mexican immigrants.[5] After the Civil War, American Indians and poor whites joined the emancipated slaves as agricultural laborers.[5] The onset of the Great Depression and the environmental deterioration in the "Dust Bowl" regions forced many more poor whites "to join the already substantial numbers of African Americans, Mexicans, and other 'non-white' migratory and seasonal laborers."[5] The onset of World Wars I and II precipitated instability in the agricultural labor market, and led to increased reliance of US farmers on immigrants from Mexico.[5] Although presently largely represented by Hispanic immigrants, migrant farm workers are culturally diverse, and include African Americans, American Indians, Asians, whites, and immigrants from the Caribbean.[2,5,6]

The current predominance of Hispanic immigrants as US agricultural laborers has its origin in immigration policies of the early and mid-twentieth century. Most importantly, the United States and Mexico signed an international agreement in 1942, known as the "Bracero" program, to fulfill agricultural labor needs.[5,7] Although terminated in 1964, the Bracero program initiated the socio-demographic and migration pattern seen among farm laborers in the United States today. Migrants follow patterns traditionally identified as Eastern, Mid-Western, and Western migratory streams.[7,8] Drawn by work available during peak harvest seasons, migrant families travel increasing distances to the north from "home bases" in the southern United States, Mexico, and Central and South America. As the harvest seasons end in the north, many workers and their families return to their usual home bases of Florida, Texas, California, Mexico, or Central America.

Definitions of Migrant and Seasonal Agricultural Workers

Systematic characterization of this population is complicated by mobility and organizational factors related to defining agricultural laborers.[9] Migrant farm workers are differentiated from seasonal farm workers; and agriculture is differentiated from other types of seasonal employment. The federal Migrant Health Program defines a "migratory agricultural worker" as "an individual whose principal employment is in agriculture on a seasonal basis, who has been so employed within the past twenty-four months, and who establishes for the purpose of such employment a temporary abode."[10] A "seasonal agricultural worker" is defined as "an individual whose principal employment is in agriculture on a seasonal basis and who is not a migratory agricultural worker."[10] Alternatively, the US Department of Labor defines a "migrant agricultural worker" as "an individual who is employed in agricultural employment of a seasonal or other temporary nature, and who is required to be absent overnight from his permanent place of residence."[11] While these distinctions are becoming less important for many services, they still are employed for others.

TABLE 1. Profile of Farm Workers in the United States (NAWS 2000)

Age	
Average	31 years
Median	29 years
Age less than 35 years	67%
Foreign-born	81%
Born in Mexico	95%
Unauthorized workers	52%
Female	20%
Married	52%
Parents with children	45%
Income level below poverty	61%
Families with less than $10,000 annual income	61%
Years of education completed	
Median	6 years
12 years or more	15%

NAWS, National Agricultural Workers Survey.

Socio-demographics

There are few population-based social, demographic, financial, and health or social services use data on migratory agricultural workers and their dependents in the United States. National data that profiles farm workers in the United States come from the US Department of Labor's National Agricultural Workers Survey (NAWS). While migrant workers are included in this survey, this is not a survey of migrant workers per se, but of agricultural workers in general. Recent data from this survey (Table 1) characterize migrant workers as predom-

inantly young, impoverished immigrants who originate predominantly from Mexico.[12] Moreover, trends in NAWS data between 1990 and 1997 reveal an increase in the proportion of Mexican nationals (53% to 65%), a stable median age, a decrease in the percentage of females (25% to 19%), a 10% increase in foreign-born workers, an increase in illegal workers (7% to 37%), no change in median income level, and an increase in families in poverty (50% to 61%).[6] National estimates of the numbers of women and children are unreliable; however, an estimate that 38% of migrant and seasonal farm workers and dependents are women and children less than 14 years old has been reported.[13]

Enumeration

Enumeration of migrant farm workers remains elusive. Enumeration is complicated by:

(1) inconsistent definitions used,
(2) variation in techniques used to estimate workers, and
(3) the inherent mobility of this population. Past enumerations have been conducted by the Migrant Health Program[10] and the Migrant Enumeration Project of 1993.[14] These enumeration estimates range from approximately 3 million[14] to 4.2 million.[10] Recent enumerations reveal that the five states with the highest estimated numbers of migrant farm workers are California (938,758 workers), Texas (197,393), Florida (197,182), Washington (186,976) and North Carolina (100,960).[14] After accounting for dependents, the enumeration from these states increases to approximately 2.76 million.[15]

Immigration Status

As a largely foreign-born labor force, the immigration status of migrant workers is salient to their social, economic, and health related experiences. Contracting, transporting (inter- and intra-national), housing, and payment of migrant workers has been historically, and now is increasingly, linked to the use of farm labor contractors or "crew leaders."[2] Workers usually are completely dependent upon the crew leader. The use of crew leaders is generally associated with more labor law abuses than are commonly found among migrant workers employed directly by farmers.[2] A much smaller (about 35,000) but growing number of farm workers are immigrants employed under the H2A Temporary Foreign Farm Worker Program.[2] These all male "guest workers" are admitted to fulfill temporary agricultural needs during peak harvest periods. Historically, this work force was composed largely of Jamaican and other Caribbean nationals who harvested sugarcane in the southeastern United States. Recent technological advances in the harvest of sugarcane have shifted the demographic origins and the geographic distribution of these workers to Mexican nationals harvesting tobacco in the Mid-Atlantic States.[2] Although H2A workers are legally authorized to work in agriculture in the United States, migratory agricultural workers are increasingly undocumented workers.[2,6,12]

Housing

In general, housing for migrant farm workers has been characterized as deplorable. The most commonly used housing for migrants includes "barracks" type labor camps, mobile home units or "trailers", and single family homes used to house multiple and often unrelated families. Regional variations exist, and range from apartments and homes to cars, barns, animal pens, open spaces, and caves. The Occupational Safety and Health Act (1970) provides guidelines to ensure the safety of migrant housing, employer compliance with proper field sanitation guidelines, and expected employer-to-employee communication regarding pesticides.[5] In 1997, however, exemptions to these standards left about one-half of all crop workers potentially unprotected.[5] Moreover, the Environmental Protection Agency's Worker Protection Standard (1992) establishes guidelines for the protection of workers from exposure to pesticides. Inadequate oversight by this agency also has been documented.[16,17] As a result of exemptions and inadequate oversight, migrant housing is customarily noted to be "overcrowded, unsanitary, unsafe, and ...sometimes [fails] to even shelter the occupants from the elements."[18] Lack of access to water often leads to the use of unsanitary and potentially chemically polluted drainage ditches for both bathing and drinking. Moreover, many camps lack privacy, even for toilet facilities. The placement of labor camps contiguous to and within fields, places workers and their families at risk of direct exposure to harmful pesticides. The lack of access to water in many camps also facilitates ongoing individual and family exposure to hazardous chemicals after workers return home.

Labor and Economic Conditions

The expansion and financial growth of US agriculture over the past decade co-exists with a range of stagnant to deteriorating economic and labor conditions among migrant farm workers.[2] Salient trends contributing to these unfavorable economic and labor conditions among migrant farm workers include: (1) the supplanting of small farms by an increasing number of large farms that plant and harvest labor-intensive crops, (2) instability in the agricultural labor market resulting in an oversupply of workers who are increasing young, male, migrant, foreign-born, and undocumented, (3) an increase in the number and usage of farm labor contractors, and (4) continued exclusions of agricultural workers from protective labor, health, and social legislation.[2] Subsequent and inclusive amendments to the 1938 Fair Labor Standards Act (FLSA) now extend the protections of a minimal wage and overtime pay to many agricultural workers. Despite these inclusive expansions, "an array of exemptions" exclude 79% of crop farms, exclude selected agricultural workers from minimum wage protections, and "deny most the right to overtime pay."[2,5] Moreover, most farms remain "exempt from the obligation to provide workers with potable drinking water, toilets, and hand-washing facilities."[2] Agriculture is among the most hazardous of US occupations; however, "many farm workers remain ineligible for unemployment benefits and workers compensation insurance."[2]

Child Labor

The involvement of children as agricultural laborers in the United States is widely recognized.[19-25] Exact numbers of agricultural child laborers are not known; however, estimates range from the likely "undercount" by the General Accounting Office of 300,000 15- to 17-year-olds to the 800,000 estimate of child farm workers by the United Farm Workers Union.[25] The differential treatment of children working in agriculture, as compared to those performing non-agricultural labor, translates into important health and safety risks for them. Key to the vulnerability of child farm workers is the limited applicability to them of the 1938 FLSA and its amendments. Although established to set minimum limits on work ages, wages, and the quantity and quality of work hours, the FLSA originally excluded farm workers. Amendments in 1966 extended some coverage to farm workers, while amendments in 1974 incorporated minimal restrictions on child labor.[25] Despite these changes, the number of hours outside of school time that a child can work in agriculture remains unlimited. Moreover, legal avenues remain for parents to consent to children 13 years and younger to work in agriculture. Finally, the minimum age at which a child farm worker can use hazardous chemicals or machinery is 16 years, as compared to 18 years for non-agricultural workers. Child agricultural laborers are therefore exposed to extremely long work hours and are at risk of poor educational outcomes, "pesticide exposure, repetitive-motion disabilities, fatigue and injuries, and depression and substance abuse."[25]

Health Legislation Affecting Migrant and Seasonal Workers

In the late 1930s, the Farm Security Administration established Farm Security Camps "at major points of farm labor demand."[5,18] In addition to providing housing, these camps provided basic health care services, camp-assigned outreach professionals, and established a referral network of physicians and hospitals.[18] After its termination in 1947 (then called the Farm Labor Program), conditions for farm workers remained largely unregulated until the passage of the Migrant Health Act in 1962.[18] The Migrant Health Act authorized the delivery of primary and supplemental health services to migrant and seasonal farm workers, and was administered by the US Department of Health and Human Services. Currently, the Migrant Health Program (MHP) resides within the Bureau of Primary Health Care (BPHC) and serves about 15% of US migrant and seasonal farm workers.[26] Under the Health Centers Consolidation Act of 1996, an amendment to the Public Health Service Act, administration of the migrant health program has been consolidated with health care services for the homeless, for public housing residents, and for community health centers.[5,26] In 2001, the MHP served approximately 650,000 farm workers, and operated 400 clinics in 40 states and Puerto Rico.[26]

The most recent social and health legislation anticipated to have an impact on migrant workers and their dependents is the Personal Responsibility and Work Opportunity Reconciliation Act of 1996.[27] This Act links citizenship and immigration status to the receipt of public health insurance and selected social services. The salience of this fact to migrant farm workers and their families is proximal, secondary to the largely foreign-born composition of this population. If immigration-related barriers posed by these policies further degrade health services access by migrant families, then

migrant mothers and children, particularly if undocumented, may be the most vulnerable of US residents.

Health Services Research Among Migrant Children

Despite the longstanding presence of migratory agricultural workers in the United States, few health services research studies address this population.[18,28-31] Within this small body of literature, most of what is known relates to adults. A recent literature review of migrant children's health services use revealed a limited body of literature that not only is inconsistent in areas studied, but also is inconsistent in its findings.[32] For example, the literature consistently describes the inadequacies of migrant children's dental and nutritional health; however, little is known about health outcomes, morbidities, and service utilization among migrant children.[33-42] The empirical studies that address these issues reveal that:

(1) high proportions of migrant children have acute and chronic health problems,[33-38]
(2) as compared to their non-migrant ethnic counterparts in the United States, migrant children have poorer response to both global and functional measures of health status,[37] and
(3) migrant children have higher infant and childhood mortality rates than non-migrant US children.[38]

Existing studies also reveal that migrant children have generally low preventive care use and immunization rates.[36,38-40] A recent analysis[32] revealed that high proportions of migrant children are foreign-born (69%), lack enabling resources (73% uninsured and 65% lack interpreters for medical visits), lack routine health maintenance (34% had never had a well care visit and 79% had never seen a dentist), and are reported to have unmet needs for medical care (53%). The current linkage of public health insurance to citizenship and immigration status has the potential to increase the existing vulnerabilities among farm workers and their families.

The Emergency Care Context

In general, the care of children requires modifications from that directed to adults. The need for these modifications stems from the combination of the biological, social, emotional, and developmental vulnerability of children.[43] In addition to the need for a unique approach to children in general, the children of immigrants often present particular concerns. The effective delivery of acute care to the children of migratory agricultural workers requires awareness of and attention to their unique health access barriers, issues of continuity and compliance with care, and to their unique health and injury risks.

Health Access Barriers

Health access barriers among migrant children stem largely from socio-economic vulnerabilities, enabling resource limitations, and vulnerability related to family or child immigration status. Among migrant farm workers, subsistence level incomes and high levels of pressure to work result in a survival orientation in which care seeking is often highly discretionary. Many workers claim that to miss even one day of work could cost them their job. When care is sought, families are unlikely to be able to afford recommended medications or interventions. Even "inexpensive" medications are likely to place severe financial stress upon those migrant families able to obtain them. This situation is compounded by a lack of enabling resources among many farm worker families. Important resources often lacking among farm worker families include transportation, knowledge of where to go for care, health insurance, and interpreters. Dependence on crew leaders or others may delay care during non-working hours or may preclude the receipt of care at all. Moreover, even when care is sought, lack of transportation may delay or prevent families from receiving recommended follow-up care.

Health access barriers for migrant children are also created by concerns related to immigration status. Key areas of vulnerability are lack of health insurance and fear of discovery of undocumented immigration status. Even among those migrant children with insurance coverage under Medicaid, the lack of interstate reciprocity of Medicaid in nearly all states in the United States, leaves many children without effective health insurance coverage upon migration. Moreover, as migrant workers are increasingly undocumented immigrants (whose foreign-born children also are likely to be undocumented), many may delay or defer care because of fear of discovery and deportation. This concern may also create barriers to care for children in "mixed-status"[44] families—in which the children are United States citizens by birth, but have non-citizen parents.

TABLE 2. Special Considerations for the Emergency Care of Migrant Worker Children

Access barriers
- Initiate treatments in ED
- Extended ED observation
- Arrange early primary care follow-up
- Adequate interpretive services

Compliance barriers
- "Forward thinking" treatment plans
- Visit summaries for caregivers
- Record "home-base" address
- Inquire about foreign sources of care and medications

Special health risks
- Consider "exotic," foreign diseases (eg, TB)
- Consider folk practices
- Child labor associated exposures (eg, pesticides)
- Anticipatory guidance (eg, car seats)

Abbreviations: ED, Emergency department; TB, tuberculosis.

For physicians that care for migrant children in the emergency department (ED), several options are available to mitigate the effects of these access barriers (Table 2). These options can facilitate the delivery of care that is appropriate and that is not "second class."

- First, sincere consideration should be given to the affordability and accessibility of recommended treatments. When possible, recommended treatment may need to be administered in the emergency setting. Examples include the initiation of antibiotic therapy or the delivery of intravenous rehydration fluids for families unlikely to obtain oral rehydration fluids, or to have access to refrigeration for fluid or antibiotic storage.
- Second, it may be necessary to extend the ED observation period for a child who is geographically isolated, who lacks reliable transportation, or who lacks access to follow-up care where language may be a barrier.
- Third, the arrangement of early (ie, next day) ambulatory follow-up care may greatly reduce a family's encounter with single or accumulated financial, resource, and immigration related barriers. Early contact with a primary care provider can be useful in reassessing and/or facilitating the ongoing need for interventions. Primary providers also may be able to connect a migrant family to available social services and community safety nets for immigrant families. Particularly useful to both primary care and emergency clinicians are Community and Migrant Health Centers (C/MHC). This national network of primary health care centers can draw on clinic-based outreach professionals, clinic-based interpreters, and culturally responsive educational materials to facilitate both care delivery and follow-up.
- Finally, it is important for providers in areas of high density of farm workers to make available high quality medical interpretation services. This service should extend to field-based and often first response emergency medical services systems. The difficulties that may arise in using child interpreters or even custodial adults, in cases of potential neglect or abuse, are obvious; however, subtle errors in translation can also needlessly interfere with optimal care or can lead to medication errors. Moreover, providers should not assume that a Hispanic migrant family speaks or understands Spanish. Occasionally, workers may speak *Mixtec, Otomí,* or another indigenous language. These families may exemplify a culturally-based desire to agree with the provider, and therefore nod affirmatively without actually understanding English or Spanish.

Health Care Continuity and Compliance Barriers

The quantity and the quality of migration may affect continuity of and compliance with recommended health care for migrant children. Although some families may not move in a given year, others may move four or more times a year to seek work. The migration patterns followed by farm workers can be inter- or intra-national. Those migrating intra-nationally may travel inter- or intra-state. Moreover, families may be simultaneously characterized by all three of these migration patterns. Dependence upon crew leaders means that many families lack knowledge of their geographic location within the United States, for which farmers they are harvesting crops, and when they will move to the next job. It is not unusual for a team of workers to leave unexpectedly in the middle of the night. This situation presents obvious concerns about the potential for inadvertently missed follow-up care and inadequate compliance with recommended treatments.

Although these situations are not always avoidable, several opportunities exist for emergency medicine clinicians to reduce the likelihood of their adverse effects (Table 2).

- First, clinicians should give consideration to providing as comprehensive a treatment response as is possible, appropriate, and feasible for *any* ED visit by migrant children. This forward thinking approach is not a suggestion to subsume the primary care provider's role. This approach creates opportunities for emergency clinicians to explore and to take advantage of the full range of what is possible, in the emergency setting, to address both short and long term factors that facilitate continuity and compliance with care. A simple example is the treatment of an uncomplicated dermatitis that is most likely to be atopic, but for which there is concern about a fungal component. Rather than depend upon a recommended follow-up visit to evaluate or distinguish between the two diagnoses, it may be prudent to:
  (1) provide a prescription for both treatments, and
  (2) instruct the parents about which medication to initiate and when to consider the second. Although simplified, this approach can be adapted to other clinical situations as appropriate.
- Second, consider providing families with a copy of the visit summary. When possible, lab results may need to be included. In cases where there is pressure for timely follow-up, it may also be helpful to address a note to the next (albeit anonymous) doctor, requesting that he or she contact you or your hospital upon receipt of the note. This information could provide valuable clinical and contact information to the next clinician to evaluate the child. It may even prevent unnecessary and repeated therapies, such as immunizations or trials of previously ineffective medications.
- Third, it may be helpful to find out to where a family plans to migrate, or what is considered their *permanent* address. As families usually have home-bases where they are better connected to social and health providers, this information may be important if they need to be tracked. This can be invaluable information to outreach workers employed along a migrant stream. Given a usual address or a county name in another state, outreach workers are often successful in locating families in the home-base. In addition to contacting the local C/MHC in your county, contacts at Farm Worker Health Services, Inc. and/or the migrant stream coordinators (Table 3) page may be invaluable.
- Fourth, it may not be accurate or prudent to assume that the source of past, usual, and follow-up care or medication procurement is based in the United States. Accuracy of this information may entail obtaining the country of the primary care provider. Similarly, a medication history should assess medication received from outside of the United States. Inquiry should include both prescription and non-prescription medication. It is not unusual in Mexico to obtain, without a prescription, medicines that require one in the United States. Also, many *Tiendas* are springing up in the United States, where medicines can be obtained without prescriptions. For medicines received from outside of the United States, it may be necessary to consult a pharmacist about composition equivalency to a US counterpart.

TABLE 3. National and State Agencies for Information About Migrant Farm Workers

Migrant Health Program
http://bphc.hrsa.gov/migrant/default.htm

Migrant Clinicians Network
http://www.migrantclinician.org/index.html

National Center for Farm Worker Health
http://www.ncfh.org/

Migrant Stream Coordinating Agencies
- Eastern: http://www.ncphca.org/program_services/migrant_health.htm
- Mid-Western: Vacant
- Western: http://www.nwrpca.org/

Farmworker Health Services, Inc.
http://www.farmworkerhealth.org/

East Coast Migrant Head Start Project
http://www.ecmhsp.org/

The United States Department of Labor
http://www.dol.gov/

Heath and Injury Risks

Health and injury risks among migrant children are linked to their migration trajectories, living conditions, and involvement in and contact with agricultural labor. Migrant and seasonal farm work-

ers represent an ethnically and racially diverse population. Migration therefore occurs from a number of sending countries, many of which are considered developing nations. The substandard housing and adverse living and working environments for migrants and their families in the United States often replicate these "third world" living conditions. The unique child labor provisions for agriculture, as compared to non-agricultural work, disproportionately expose migrant children to environmental and health risks.

Emergency clinicians can optimize the care of migrant children by taking into consideration the contribution to health of their unique ecological context (Table 2).

- First, the clinician should always consider the possibility of illnesses that are not prevalent in the United States. This is especially true for infectious diseases. Examples include helminthic infestations, measles, and tuberculosis.[45-48] In particular, cases of extra-pulmonary, as well as both single- and multi-drug resistant tuberculosis are likely.
- Second, emergency clinicians should become familiar with folk illnesses and "culture bound syndromes."[49] These symptoms reflect "culturally-based illnesses categories or may suggest a psychogenic origin of symptoms."[49] Common examples of folk illnesses referred to among Hispanic peoples include *nervios, susto, caida de mollera, empacho,* and *mal de ojo*.[49,50] Folk illnesses are addressed elsewhere in this issue, and will not be addressed further here.
- Third, clinicians should remain vigilant for the possibility that musculoskeletal pain or injuries and dermatitis in children may be the result of child labor in the fields. Nicotine poisoning associated with "green tobacco sickness" also should be considered. Focus group testing by this author has found that *inaccurate* information regarding the involvement of children in labor might be obtained by asking directly about the child "working." If the child is not paid separately, many families consider the child to be "helping out" rather than working. Similarly, vigilance should be applied to the possibility of work related pesticide exposures in children. Although uncharacteristic in children in non-farm work, the laxity in child labor laws for agriculture means that symptoms of pesticide poisoning may be seen in very young migrant children. If growers are using unusual pesticides, it may be helpful for EDs to be informed, in advance, of the use of these chemicals.
- Finally, population-based safety standards in the sending countries may be non-existent or may differ from those in the United States. Whenever feasible, emergency clinicians should take the opportunity to inquire about and to educate families regarding the use of motor vehicle safety belts and child car seats.

An equally important avenue of health and injury risks is found in migrants' living environments. The previously discussed and deplorable housing conditions place children at risk of direct pesticide exposures and unsafe water supplies for bathing and cooking. Bathing and toilet facilities, when provided, often are designed for multiple users, lack privacy, and lack routine sanitary management. Inadequately maintained housing places children at risk of physical injuries due to exposed and rusted nails, faulty porch steps, torn screens, and thermal injuries resulting from exposed light bulbs and the use of hot plates or space heaters as heat sources. Moreover, the occurrence of these injuries, as well the risk of direct physical violence, including sexual assault, are likely among children left in the camps unsupervised or supervised by other minors. Emergency clinicians should consider the ecological context of injuries and may need to contact state-based regulatory agencies (such as departments of labor) or supportive social services agencies as a complement to direct medical care. Moreover, clinicians can optimize care by inquiring about the suitability and the cleanliness of living conditions. This may be especially important for the outpatient management of intravenous catheters, wounds, burns, and newborn cord or circumcision care.

References

1. Oliveira V, Effland ABW, Runyan J, et al: Hired Farm Labor Use on Fruit, Vegetable and Horticultural Specialty Farms. Washington, DC, US Department of Agriculture, 1993.

2. US Department of Labor Report to Congress: The agricultural labor market—status and recommendations—2000. Available at: http://migration.ucdavis.edu/rmn/word-etc/dec_2000_labor.htm. Accessed January 22, 2004.

3. Linder M: Migrant Workers and Minimum Wages: Regulating the Exploitation of Agricultural Labor in the United States. Boulder, CO, Westview Press, 1992.

4. Taylor EJ, Martin PL, Fix M: Poverty Amid Prosperity: Immigration and the Changing Face of Rural California. Washington, DC, The Urban Institute Press, 1997.

5. Sanders M: Forty Years Of Migrant Health. Austin, TX, The National Center for Farmworker Health, 2002.

6. Mines R, Gabbard S, Steirman A: A Profile of US Farm Workers: Demographics, Household Composition, Income and Use of Services. Washington, DC, US Department of Labor, 1997.

7. Leone LP, Johnston HL: Agricultural Migrants and Public Health. Migrant Farm Workers in the United States: Briefings of the Commission on Security and Cooperation in Europe. Washington, DC, US Government Printing Office, 1994, pp. 330-337.

8. Johnston HL: Health for the Nation's Harvesters: A History of the Migrant Health Program in its Economic and Social Setting. Farmington Hills, MI, National Migrant Worker Council, Inc, 1985.

9. Lukomnik JE: Developing indicators of access to care: The case for migrants and the homeless, in Millman M (ed): Access to Health Care in America. Washington, DC, National Academy Press, 1993, pp. 199-218.

10. Bureau of Health Care Delivery and Assistance: Migrant Health Program: An Atlas of State Profiles Which Estimate Number of Migrant and Seasonal Farm Workers and Members of Their Families. Rockville, MD, US Department of Health and Human Services, 1990.

11. United States Code: Title 29, Migrant and Seasonal Worker Protection, Chapter 20, Section 1802. Available at: http://eresources.lib.unc.edu/cgi-bin/external_database_auth? A=P F=Y ID=145 URL=http://www.lexis-nexis.com/congcomp/. Accessed November 4, 2003.

12. Mehta K, Gabbard S, Barrat V, et al. Findings From the National Agricultural Workers Survey (NAWS) 1997-1998. United States Department of Labor, Research Report No. 8. Available at: http://www.dol.gov/asp/programs/agworker/report_8.pdf. Accessed November 3, 2003.

13. Briefings of the Commission on Security and Cooperation in Europe: Migrant Farm Workers in the United States. Washington, DC, US Government Printing Office, 1993.

14. Larson AC, Plascencia L: Migrant Enumeration Project: Migrant Legal Services. Bethesda, MD, The Office of Migrant Health, US Department of Health and Human Services, 1993.

15. Larson A: Migrant and seasonal farmworker enumeration profiles study. Bethesda, MD, Office of Migrant Health, Bureau of Primary Health Care, US Department of Health and Human Services, 2000. Available at: http://bphc.hrsa.gov/migrant/Enumeration/EnumerationStudy.htm. Accessed November 3, 2003.

16. US General Accounting Office: Pesticides: Improvements needed to ensure the safety of farmworkers and their children. (GAO/RCED-00-40.) Washington, DC, US General Accounting Office, 2000.

17. US General Accounting Office: Child Labor in Agriculture: Changes Needed to Better Protect Health and Educational Opportunities. (GAO/HEHS-98-193.) Washington, DC, US General Accounting Office, 2000.

18. National Migrant Resource Program: Recommendations of the National Advisory Council on Migrant Health. Austin, TX, National Migrant Resource Program, Inc, 1993.

19. Wilk V: Health hazards to children in agriculture. Am J Industr Med 24:283-290, 1993.

20. Davis S: Child Labor—Migrant Health Issues, Monograph Series (Monograph No. 10). Buda, TX, National Center for Farmworker Health, Inc, 2001.

21. Rivara FP: Fatal and non-fatal farm injuries to children and adolescents in the United States. Pediatrics 76:567-573, 1985.

22. Rivara FP: Fatal and non-fatal farm injuries to children and adolescents in the United States, 1990-1993. Inj Prevent 3:190-194, 1997.

23. Landrigan PJ, Pollack SH, Belville R, et al: Child labor in the United States: Historical background and current crisis. Mt Sinai J Med 59:498-503, 1992.

24. Pollack SH, Landrigan PJ: Child labor in 1990: prevalence and health hazards. Ann Rev Pub Health 11: 359-375, 1990.

25. Fingers to the Bone. United States Failure to Protect Child Farm Workers. New York, NY, Human Rights Watch, 2000.

26. Bureau of Primary Health Care: Migrant Health Program Fact Sheet. Available at: http://bphc.hrsa.gov/programs/MHCProgramInfo.htm. Accessed November 3, 2003.

27. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996, Pub. Law No. 104-193, 110 Stat. 2105 (August 22, 1996).

28. Rust GS: Health status of migrant farm workers: A literature review and commentary. Am J Pub Health 80: 1213-1217, 1990.

29. American Academy of Pediatrics: Guidelines for the Care of Migrant Farmworkers' Children. Elk Grove Village, IL, American Academy of Pediatrics, 2000.

30. American Academy of Pediatrics Committee on Community Health Services: Health care for children of farmworker families (RE9527). Pediatrics 95:952-953, 1995.

31. Weathers AC: Use of health services by the children of migratory agricultural workers: What's known, what's new, what's needed. Migrant Health Newsline, National Center for Farmworker Health, 2003, pp. 2-3.

32. Weathers A, Minkovitz C, O'Campo P, et al: Health services use by children of migratory agricultural workers: Exploring the role of need for care. Pediatrics 111:956-963, 2003.

33. Watkins E, Larson K, Harlan C, et al: A model program for providing health services for migrant farmworker mothers and children. Pub Health Rep 105:567-575, 1990.

34. Smith G, De Angelis C, Hanser J: The health status of a subgroup of migrant American children: The role of a medical center as a service and educational institution in the community. Clin Pediatr 17:900-903, 1978.

35. Michael RJ, Salend SJ: Health problems of migrant children. J Sch Health 55:411-412, 1985.

36. Dever GE: Migrant Health Status: Profile of a Population With Complex Health Problems. Austin, TX, Migrant Clinicians Network Monograph Series, 1991.

37. Ruducha J: Migrant Child Health: The Role of Social, Cultural, and Economic Factors. Austin, TX, National Migrant Resource Program, Inc., 1994.

38. Slesinger DP, Christenson BA, Cautley E: Health and mortality of migrant farm children. Soc Sci Med 23:65-74, 1986.

39. Chase HP, Kumar V, Dodds JM, et al: Nutritional status of preschool Mexican-American migrant farm children. Am J Dis Child 122:316-324, 1971.

40. Watkins E, Larson K, Harlan C, et al: A model program for providing health services for migrant farmworker mothers and children. Pub Health Rep 105:567-575, 1990.

41. Seid M, Castaneda D, Mize R, et al: Crossing the border for health care: Access and primary care characteristics for young children of Latino farm workers along the US-Mexico border. Ambul Pediatr 3:121-130, 2003.

42. Guendelman S: Health care users residing on the Mexican border: What factors determine choice of the US or Mexican health system? Med Care 31:345-357, 1993.

43. Grason H, Morreale M: Health services of children and adolescents: A non-system of care, in Stein REK (ed): Health Care For Children: What's Right, What's Wrong, What's Next. New York, NY, United Hospital Fund of New York, 1997, pp. 107-133.

44. Fix M, Zimmermann W: All under one roof: Mixed-status families in an era of reform. Washington, DC, The Urban Institute, 1999. Available at: http://www.urban.org. Accessed March 13, 2002.

45. Ciesielski SD, Seed JR, Esposito DH, et al: The epidemiology of tuberculosis among North Carolina migrant farm workers. JAMA 265:1715-1719, 1991.

46. Ciesielski S, Esposito D, Protiva J, et al: The incidence of tuberculosis among North Carolina migrant farm workers. Am J Pub Health 84:1836-1838, 1994.

47. Ciesielski SD, Seed JR, Ortiz JC, et al: Intestinal parasites among North Carolina migrant farmworkers. Am J Pub Health 82:1258-1262, 1992.

48. Centers for Disease Control and Prevention: Prevention and control of tuberculosis in migrant farm workers. Washington, DC, US Government Printing Office, 1992.

49. Baer RD, Clark L, Peterson C: Folk illnesses, in Loue S (ed): Handbook of Immigrant Health. New York, NY, Plenum Press, 1998, pp. 183-202.

50. Flores G, Vega L: Barriers to health care access for Latino children: A review. Fam Med 30:196-205, 1988.