# Federal Farmworker Housing Standards and Regulations, Their Promise and Limitations, and Implications for Farmworker Health

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**Abstract**

The housing available to most farmworkers is substandard and unacceptable in 21st-century America. The federal government established minimal occupational safety and health standards applicable to migrant farmworker labor camps decades ago, and some states have statutory schemes and regulations that set standards for farm labor camps and employee housing. Many of these federal and state regulations no longer reflect current employment and housing trends, and enforcement success varies greatly. These regulations implicitly recognize the connection between housing conditions and health, but do not effectively address that connection. This review

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describes the current state of farmworker housing, discusses laws and regulations pertaining to such housing, and highlights the literature on health risks associated with inadequate housing. We propose specific recommendations to strengthen enforcement and reduce the risks of substandard housing for the health of farmworkers and their families.

**Keywords**
farmworker, housing, health

## Introduction

Farmworkers and their families in the United States do not control the quality, site, or safety of their housing. It is beyond debate that the housing available to most farmworkers is substandard and unacceptable in twenty-first-century America. Many farmworkers experience crowded and harsh conditions for which they overpay, with little chance for relief without fear of retaliation. Residences can consist of no more than an onion field, tarp, parking lot, shed, old motel room, or dilapidated and dangerous rental dwelling.[1] Others include organized farm labor camps operated by employers, farm labor contractors (FLCs), or industry-related housing providers. More fortunate farmworkers live in housing provided through federal or state subsidies, which tends to be well managed and decently maintained. Most live in substandard rental housing that is not specially designed for farmworkers but often is targeted to them because they are a vulnerable tenant group, unlikely to complain. This housing might be in agricultural or urban areas, is generally of poor quality, and is regulated poorly by state housing laws that apply to all landlords and tenants.

Decades ago, the federal government established minimal occupational safety and health standards applicable to migrant farmworker labor camps, under the U.S. Department of Labor (USDOL), Employment and Training Administration (ETA) (20 CFR §654.400 *et seq*[2] and Occupational Safety and Health Act, USDOL 29 CFR §1910.142).[3] Some states also have statutory schemes and regulations that set standards for the maintenance of farm labor camps and employee housing.

Many of these federal and state regulations no longer reflect current employment and housing trends, and all have varying degrees of success in enforcement. These standards do not adequately address the connection between housing conditions and health. According to a 2008 report from the National Academy of Sciences:

> [V]irtually all recent survey research have [*sic*] demonstrated that a large share of this workforce is still experiencing unwarranted risks to health that are associated with their housing conditions. ...The issue is complex: socioeconomic

> status, housing conditions, risky behavior, workplace exposure, and immigrant worker acculturation may all be linked in unknown ways to observed health outcomes. The challenge to public health investigators to untangle those factors is daunting, and the committee recommends that NIOSH pursue such effort without further delay.[4]

The research literature specifically assessing the correlation between farmworker housing conditions and health risks is limited, but much empirical evidence is available from studies of the general population. There is a substantial body of literature documenting how conditions in individual houses and conditions in neighborhoods adversely affect public health.[5–7]

This review brings to bear the research and observations of academics, civil rights attorneys, and farmworker advocates who have years of experience in the field and in the courts. It discusses laws and regulations that pertain to farmworker housing, lays out the current state of farmworker housing, and highlights the literature regarding health risks associated with inadequate housing. Recommendations for future action also are introduced.

## Types of Housing

It is beyond the scope of this paper to discuss the nature and condition of rental housing in the United States and its connection to health outcomes. The rental housing in which many farmworkers and their families reside, however, often fails to meet the safety and health standards established by states and localities, nor does it meet the principles of the World Health Organization.[8] The principles state that adequate housing includes a safe water supply, sanitary disposal of waste, drainage of surface water, safe food protection, structural safeguards against disease transmission, and structural safety (e.g., ventilation, light, and a physical dwelling that does not expose inhabitants to dangerous conditions or hazardous substances).

Tenants are entitled to housing in good repair. Most regulations affecting this are state or local and apply to the construction and maintenance of rental housing or are implied (by the courts) in rental agreements. Enforcement of housing quality standards can be a state or local responsibility, but most often, it is left to tenants themselves. Fear of retaliation inhibits many low-income tenants from complaining, evictions can be swift and are not always court-supervised, and the threat of worse conditions or homelessness is ever-present. Farmworkers are especially vulnerable to discrimination in rental applications and in the governmental approval processes for the construction of decent, affordable housing.

Traditional on-farm labor camps comprise a small proportion of farmworker housing stock. The Occupational Safety and Health Administration's (OSHA) regulations are the standard for some farmworker housing, with some

requirements under the Migrant and Seasonal Agricultural Worker Protection Act (AWPA)(29 U.S.C. §1801, *et seq.*)[9] that are discussed below. Some states have dramatically broadened the criteria for regulating farmworker housing so that a nexus to an employer is not required (USDOL 29 CFR §1910.142 et. seq.).[3] So-called labor camps include far more than on-farm accommodations or traditional camps, but neither all farmworker housing nor all rental housing in which farmworkers reside are regulated. The rare U.S. Department of Agriculture-subsidized housing, however, has its own statutory and regulatory framework (7 CFR Part 3560),[10] which is discussed below.

## Federal Regulatory Framework

*Overview of the federal regulatory scheme.* The who, what, when, and where of federal standards pertaining to farmworker housing is not simple. Labor camp housing for farmworkers is governed by one of two sets of similar federal standards in conjunction with any applicable state and local standards. Most used are the temporary labor camp standards of the OSHA (CFR §1910.142).[3] The OSHA standards apply to temporary labor camp housing for workers in any industry, but they are most often applied to labor camps intended for farmworkers. OSHA standards are discussed in more detail below.

USDOL ETA standards for farmworker labor camps are applied far less frequently. The ETA standards are similar to OSHA standards but apply to farmworker labor camps under construction or constructed before 3 April 1980, when an employer places a job order for farmworkers through the interstate clearance system (a process in which an employer posts offers for agricultural work in specified locations).

Specific housing is covered either by OSHA or ETA standards but not both, and state and local standards also might apply. The U.S. Department of Agriculture §514/§516 Farm Labor Housing Program standards (7 CFR Part 3560),[10] which exceed OSHA and ETA standards, also can be used by individual farmers to construct labor camp housing, although this is rare.

Federal farm labor camp standards take effect largely through two other federal statutory schemes. First, AWPA provides for administrative fines, injunctions, and damages in civil suits against camp owners and operators if their housing does not comply with the applicable federal, state, or local standards (USDOL 29 U.S.C. §1801–1806).[9] Housing protections under AWPA extend only to migrant agricultural workers (i.e., workers who are employed in temporary or seasonal agricultural employment that requires them to be absent overnight from their permanent place of residence) (U.S.C. §1802).[9] The DOL Wage and Hour Division enforces AWPA and can issue civil money penalties for violations of the Act and revoke or refuse to issue licenses to FLCs. AWPA also includes a private right of action, which allows any farmworkers who are aggrieved by violations of their rights under the Act to sue for

actual or statutory damages and injunctive relief in state or federal court. AWPA prohibits retaliation, threats, intimidation, and other interference with farmworkers' exercise of housing and other rights protected under this law (U.S.C. §1855).[9]

AWPA housing provisions require any person who owns or controls a facility used as housing for migrant agricultural workers to ensure that it complies with all the applicable substantive federal and state health and safety standards (U.S.C. §1823).[9] Stricter state or local standards have precedence. AWPA requires that housing be inspected and a permit posted by the applicable federal or state authority before a migrant agricultural worker is allowed to occupy the premises, though certain exceptions apply (U.S.C. §1823).[9] AWPA also requires FLCs to identify on their applications for registration each facility to be used to house migrant agricultural workers. FLCs who own or control the site also must provide proof of a permit or license from the appropriate inspection agency that the housing complies with applicable federal and state standards (U.S.C. §1823).[9]

AWPA imposes significant potential liability for growers, FLCs, and housing owners or operators because individual farmworkers can sue for damages for noncompliance. Housing inspection and enforcement schemes vary from state to state, but the specter of liability under AWPA can create an incentive for those who own or control housing for migrant farmworkers to meet the standards before their applications can be approved.

A second portal to the federal regulatory scheme opens when employers hire temporary agricultural guest workers (who have temporary immigrant work (H-2A) visas). H-2A program employers must provide free housing for all their migrant workers, housing which meets either OSHA or ETA standards, depending upon when it was constructed. The employer can provide housing that is available to the general public on the same terms and conditions, such as a motel, but regulations mandate that it meet the OSHA standards if neither the state nor the locality has its own standards. OSHA standards are a minimum that states or localities can exceed. Employers seeking H-2A program guest workers must present proof to DOL's Office of Foreign Labor Certification from their state Job Service that the housing meets applicable standards. The state Job Service must be notified if any H-2A housing sites are changed for any reason and must have proof that the new housing meets standards (20 CFR §655.122).[11]

*OSHA temporary labor camp standards are inadequate.* OSHA standards for temporary labor camps are the most widely used standards nationally, but the scope of their coverage is limited. OSHA standards cover only temporary labor camps, by definition. AWPA provides housing protections only to migrant agricultural workers. Farmworkers who live year-round in housing that is owned or controlled by their employer are not protected by OSHA standards and have no remedy for substandard housing under AWPA unless they fit within the migrant definition.

The OSHA standards implicitly reflect the perspective that workers live in labor camps temporarily and then return to their own private homes. This ignores the reality of many farmworkers' lives, as they continually move from one farm labor camp to the next. Sanoff explained, "Although the length of stay at one particular location may be short, farmworkers live in temporary housing more or less permanently ... the situation may be considered permanent, but the location itself is temporary".[12] A farm employment trend in many geographical areas is to hire fewer migrant farmworkers for longer periods of temporary employment. In these cases, residence in rental housing in agricultural and urbanized areas does not typically fall within the common definition of temporary labor camps, and therefore the OSHA standards are not applicable.

*Survey of OSHA temporary labor camp standards.* OSHA standards are basic and dated and importantly, they were established before a newer and growing body of pertinent evidence was available. The standards were promulgated in 1971 but were derived from the American National Standards Institute Minimum Requirements for Sanitation in Temporary Labor Camps, published in 1968.[13] Apart from a minor change regarding drinking fountains, they have remained the same for over forty years. Evidence regarding occupational health risks to farmworkers and their families, as well as evidence regarding housing-related health risks, however, has evolved. Existing regulations are not based upon current knowledge concerning such issues as pesticide exposure, crowding, lack of ventilation, and substandard construction. Some repercussions of these deficiencies are discussed below.

## *Gaps in the Protections Afforded by OSHA's Temporary Labor Camp Standards*

*Pesticide management and housing.* Many labor camps abut cultivated areas where agricultural chemicals are applied.[14] Studies show that residential proximity to fields and orchards where pesticides were applied is significantly associated with increased organophosphate metabolites in the urine of children[15,16] and with specific pesticides found in dust samples from residences in an agricultural area in California.[17,18] Increases in the quantity of three pesticides found in dust samples were determined to be proportional to the amount of the material applied in the fields. A 2010 farmworker housing study in North Carolina found pesticide contamination in almost all houses.[19]

Even low levels of organophosphate pesticide residues can be harmful. A study of farmworkers and their families in Oregon in 2006 demonstrated the connection between low-level chronic exposures and poorer performance on neurological tests.[20] A 2007 study found that autism among children in California's Central Valley is associated with maternal residences near fields sprayed with organochlorine pesticide applications.[21]

Health risks associated with housing conditions also include infectious diseases due to crowding and poor sanitary conditions, injury from unsafe structural conditions, and other adverse effects on occupants' safety and health.[6] Poor housing conditions identified by farm laborers are associated with significantly elevated levels of anxiety and depression.[22]

*Structural conditions.* The structural standards encompassed in the shelter provisions of the OSHA regulations are rudimentary at best, requiring only each shelter provide protection against the elements, with some further instructions regarding floors (CFR §1910.142b).[3] Structural conditions are associated with a range of health risks. Water intrusion from leaky foundations and roofs is associated with respiratory disease from molds, viruses, and other sources.[23] A 2010 survey of 183 farmworker camps in eastern North Carolina found 73.8 percent of buildings had structural damage.[19] Poor construction and disrepair increase risk of injury from falls, fires, and electrical injuries.[5]

*Ventilation.* OSHA regulations allow ventilation to be provided by windows which can be opened to a 1:20 ratio to the amount of floor space in the room (USDOL 29 CFR § 1910.142b).[3] This allows for very limited air exchange during typical occupancy, often the warmest times of year. Inadequate ventilation and faulty heating and air conditioning also are associated with respiratory disease and exacerbate problems from mold.[24] Inadequate cooling may exacerbate heat stress and hinder physical recovery from field work. A North Carolina study measured the heat index in common and sleeping rooms in 170 farmworker camps and found dangerously high heat indices in most rooms, even in those rare situations where air conditioning was present.[25]

*Crowding, privacy, and storage.* Fifty square feet of living space per person is required in sleeping rooms and one hundred square feet per person in other rooms (CFR §1910.142(b)(2)).[3] The U.S. Department of Housing and Urban Development by contrast requires 165 sq ft/person in housing they fund. Crowding and the associated lack of privacy, reduced safety and security, and difficulty in maintaining hygienic conditions have been identified in farmworker housing.[26]

Crowding has a host of negative health implications. A longitudinal study found a link between crowding and an increased likelihood of infectious diseases and respiratory diseases at the age of 11 and an increased likelihood of respiratory diseases for adults. The earlier in life that children experienced crowding and poor hygienic conditions, the greater the increase in likelihood of disease.[27] Crowding is also associated with stress and other psychological conditions,[28] even when controlling for socioeconomic status.[29]

ETA regulations require "separate sleeping accommodations" for each sex or family and, if housing is to be used for a family with a child over the age of 6, a separate room or privacy partition for the parents (20 CFR §654.407.[2]

Crowding also appears to be a problem in the context of other facilities such as showers, toilets, and kitchen resources.[30] Students from the School of Design at North Carolina State University interviewed farmworkers in the late 1990s in order to design housing that met workers' health and safety needs. One of the workers' priorities was "more accessible natural spaces in which to rest and relax... Rarely is space provided for activities other than sleeping, eating or bathing".[7] Workers expressed a strong preference for greater privacy in both bathrooms and sleeping areas, including a bathroom which provided the most privacy and the more enclosed locker space to store their toiletries, medicines, and personal belongings.[12]

OSHA regulations state that "suitable storage facilities such as wall lockers for clothing and personal articles shall be provided in every room used for sleeping purposes" (USDOL 29 C.F.R. §1910.142).[3] No size or security for these facilities is specified. The result is that workers often must improvise places to keep clothes that may have been worn in the field, leaving their personal effects in insecure bunkrooms they share with many other workers.

*Water supply.* Lack of access to plentiful clean water is associated with health conditions in multiple ways. Clean water is necessary for drinking, cooking, bathing, showering, brushing teeth, and washing food and clothes.

OSHA requires that the water supply must be approved by "the appropriate health authority," normally the same local agency that tests water supplies and sewage connections for all residents of the county or municipality (USDOL 29 CFR §1910.142).[3] These tests usually are done preoccupancy (USDOL 29 CFR §1910.142),[3] with tests during occupancy conducted in response to complaints. Two studies over twenty years apart,[31,32] using valid random samples of the water in occupied labor camps in North Carolina, cast doubt on whether a preoccupancy test is sufficient to safeguard a healthy water supply (USDOL 29 CFR §1910.142).[3] Drinking water in 34 percent of camps in the 2012 study exceeded Environmental Protection Agency maximum allowable coliform levels,[29] and camps in which the water was tested preoccupancy did not have noticeably safer drinking water (USDOL 29 CFR §1910.142).[3]

Most strains of *E. coli* (a type of coliform) are harmless and live in the intestines of healthy humans and animals, but *E. coli* is significant as an indicator of water contamination. Some strains, cause diarrhea (commonly with bloody stools), fever, and abdominal pain, while other strains cause urinary tract infections, respiratory illness such as pneumonia, and other illnesses. New research indicates that the infectious strains of *E. coli* have been increasing in strength and occurrence. *E. coli, Cryptosporidium parvum*, hepatitis, and

*Giardia lamblia* are major water-borne pathogens present in the United States. Hoetez calls these "neglected infections of poverty in the US".[33]

Nitrates are a common water contaminant and are associated with proximity to livestock and failed septic systems. Exposure to nitrates or nitrites in drinking water is associated with methemoglobinemia (blue baby syndrome), sudden infant death syndrome, intrauterine growth retardation, cardiac defects, and increased risk of nervous system defects.[34] A recent study found high levels of nitrates in over 40 percent of the wells in farmworker communities in California's San Joaquin Valley.[35]

Many labor camps are located outside of city limits, and their water supply tends to be springs or shallow wells, not a municipal system. Public sewer systems rarely extend to these rural locations, so septic systems are the norm for disposal of wastewater. Septic system failure can cause water contamination, and the chances of this happening are greatly increased under certain conditions. The top reasons for septic system failure include soil wetness (seasonally high water table or flooding), undersized systems, system age, and limited space for soil absorption field.[36]

Current OSHA regulations do not address the disposal of wastewater where there is no sewer system, leaving this issue to local regulation. The studies cited above show a need for greater attention to wastewater contamination and repeated testing of labor camp water supplies.

*Toilet facilities.* Current rules about toilet facilities do not protect the dignity of labor camp occupants and make it unpleasant or difficult for workers to use the facilities. The required ratio of toilets or privies to occupants is low (one for every fifteen occupants of the same sex). Privacy screens between privy seats or toilets are not required so are not routinely provided. Flush toilets are not required; privies and chemical toilets are permitted (USDOL 29 CFR §1910.141(c)).[37] Advocates have observed that portable chemical toilets are common and are typically serviced only weekly. They provide less ventilation than the regulations require for a toilet room, rendering them unpleasant for use in all but the coolest weather.

*Laundry and bathing.* OSHA laundry and bathing standards are outdated and do not comport with widely recognized safety practices for those exposed to agricultural chemicals. Shower areas with several shower heads are typical and are not required to have privacy screens. Ratios of occupants per shower are high (one shower for every ten occupants) (USDOL 29 CFR §1910(f)(1)(ii)),[3] making a long wait for a shower upon return from work the norm. This leads to more pesticide contamination in living spaces while workers await their turn to bathe. One Oregon study found that for each additional household member working in agriculture, the median pesticide concentration level in the home increased by 170 percent.[14] Workers should shed the clothing they wear in the field and bathe

immediately upon return, without entering the living area, but current standards impede this. Standards do not require access to outside showers, temporary storage spaces for contaminated clothing outside of living areas, or facilities for storing bath supplies and clean clothing in or adjacent to bathhouses or bathrooms. Current regulations do not even mandate a place to store work boots before entering living areas.

A 2014 study highlighted the health effects of lacking washing facilities for bathing. Livestock-associated antibiotic-resistant *Staphylococcus aureus* among industrial hog operations workers in North Carolina, tested daily, persisted in nasal passages over a 14-day period, which included up to 96 hours away from work.[38]

Current standards also do not reflect contemporary understanding of how to properly treat clothing exposed to pesticides. OSHA requires one laundry tub for every thirty workers (USDOL 29 CFR §1910.142d).[3] Advocates observe that many, if not most, camp owners do not provide washing machines and when they do, there are not enough to meet the needs of all the occupants.

Many health experts and public health agencies call for washing clothing contaminated by pesticides[39] in a machine separate from nonwork clothes to prevent pesticide residues from contaminating nonwork clothing or household items. They also recommend that pesticide-exposed clothing be washed in smaller loads and on the longest possible cycle. Current standards do not enable workers to follow any of these recommendations.

Workers should wear rubber gloves when washing by hand to avoid skin contact with the pesticide-contaminated water,[39] but current OSHA standards do not require the provision of rubber gloves (USDOL 29 CFR §1910.142).[3] Best practices call for line drying of clothing exposed to pesticides. The current OSHA standards require "[f]acilities for drying clothes" with no additional direction or specificity to ensure provision of a clothesline appropriate for the occupancy level of the camp (USDOL 29 CFR §1910.1421f).[3]

*Electrical service and lighting.* Standards do not require a telephone, an omission that until recently was a serious problem when workers needed to summon help in case of illness, accident, assault, or robbery. Today most farmworkers have cell phones and need electricity to keep them charged. Current OSHA standards for lighting and electrical service are outdated and lead to dangerous overloading of labor camp wiring. The current standard requires only one ceiling light fixture and one separate wall or floor outlet for each habitable room (USDOL 29 C.F.R. §1910.142g),[3] but if only two workers inhabit a sleeping room, one outlet is insufficient to charge cell phones and have a fan, radio, or television.

Advocates observe that a dozen or more workers often sleep in a room. The illumination provided by one ceiling light fixture in a large room is generally so low that anyone wishing to read, write, or do homework still requires a lamp for task lighting, further taxing available outlets.

*Kitchens, food preparation, and garbage disposal.* Workers who reside in labor camps typically either prepare their food in the camp kitchen, if there is one, or purchase prepared meals using a commissary model. Current standards for kitchen facilities used by multiple workers are minimal and vague, requiring only "sanitary facilities for storing and preparing food," one stove in an enclosed and screened area for every ten persons or two families, and cooking equipment installed in accordance with state and local codes (USDOL 29 CFR §1910.142b).[3] A 2013 study found that lack of adequate and sanitary storage areas and cooking facilities increases the risk of food contamination and food-borne illnesses.[40] The same study found that over 65 percent of camps had refrigerators with a temperature of over 45 °F, although the U.S. Food and Drug Administration requires a temperature of 40 °F or lower. Inadequate storage space also was a common problem, causing workers to leave food supplies not securely stored, which in turn led to insect and rodent problems.

A 2007 assessment of farmworker food security found nearly half (45 percent) of study participants were food insecure, 86 percent consumed a high-fat diet, and 42 percent ate less than three servings of fruits and vegetables per day. Sharing heavily used cooking facilities limits farmworkers' willingness to buy and prepare high-quality foods, due to concerns about theft. Providing more refrigeration and cooking equipment could improve farmworkers' ability to consume more nutritional food.[41]

OSHA requires that garbage be removed "as often as necessary" for health and safety (USDOL 29 CFR §1910.141(a)(4)(ii)).[3] Advocates observe that this guideline often is violated. Inadequate garbage storage, collection, and/or facilities are associated with pests and disease vectors such as cockroaches, rats, and mice. Prevalence of *Ascaris lumbricoides, Trichuris trichiura*, and hookworms also is higher among children living in households with inadequate solid waste disposal compared to those in areas with regular garbage collection.[42]

The standards for commissary-style operations refer to the "Food Service Sanitation Ordinance and Code" of the U.S. Public Health Service, promulgated in 1965 (USDOL 29 CFR §1910.142(i)1).[3] These generally are not within the expertise of many state or federal inspectors and, if the commissary is not in operation at the time of the inspection, are uninspected.

*First aid.* The current standard has two criteria for first aid. First, adequate facilities (i.e., a kit) approved by "a health authority" must be "maintained and made available." Second, the facilities are to be in charge of "a person trained to administer first aid" and accessible at all times (USDOL 29 CFR §1910.142k).[3] The first standard is too vague to be helpful, and the second routinely is ignored and unenforceable. Many camps are inspected only before any occupants arrive, so inspectors cannot ascertain if a trained person is available. There also is no requirement that labor camp residents have a sure way to

summon help if medical attention is needed. The ineffectiveness of these standards creates dangers and increases residents' stress.

## Omissions From OSHA Standards

Current OSHA standards do not address some of the most important health risks for farmworkers who live in labor camps.

*Pesticide drift.* Foremost among the omissions are measures to prevent workers' continued exposure to agricultural chemicals through contamination of the living areas (via residues on camp residents and their clothing prior or entering the residence or from drift when pesticides are applied on nearby fields).

*Fire.* OSHA standards are silent about fire safety. They were promulgated before smoke alarms were common and lack commonsense requirements for fire alarms and multiple escape routes from fire and other safety precautions commonly required for other multiple occupancy buildings such as apartments or dormitories. The ETA standards provide for some of these (USDOL 29 CFR §654.417)[2] but do not require smoke or carbon monoxide detectors.

*Heat.* OSHA regulations address window size, but there are no federal limits on how hot workers' living spaces can be. Labor camps generally are occupied during the warmest months of the year, so they are often extremely hot. They often lack shade or insulation and are required to have only limited natural ventilation. A recent North Carolina study found that in about half of 170 camps studied, heat indices reached "caution" levels in common areas during early, middle, and late summer. Even in many of the living quarters with air conditioning, cautionary heat index levels were registered. A study from 2012 using a sample of 183 North Carolina farmworker labor camps found the heat index in the camps warranted caution (35 percent), extreme caution (44 percent), or was dangerously high (8 percent).[25]

Heat-related illness is a life-threatening health risk for migrant farmworkers, who

> suffer heat-related death at rates higher than other U.S. workers. Daily recovery helps reduce negative effects of heat on health. The potential for recovery is determined largely by non-working time spent in cooler conditions, including breaks during the day and overnight.[25]

OSHA does not have a mandatory heat stress standard, requiring shaded rest breaks during the day. Farmworkers need an opportunity to significantly cool down overnight to reduce the likelihood of heat stress and heat stroke. Current OSHA standards do not address this serious health risk.

*Security.* OSHA standards omit any basic security measures for occupants of a temporary labor camp. The current standard for "suitable" storage facilities for personal belongings does not require security. The standards similarly do not require security for rooms or buildings to guard personal safety or safeguard possessions. Workers typically cannot lock their labor camp dwelling from the inside against intruders.[19] This lack of security is a serious concern for workers who often have no safe place to store medicines, cash, or valuables, leaving them vulnerable to theft and armed robbery.

*Privacy.* Another omission in the regulations is provision for privacy, including using a toilet, bathing, dressing, or sleeping, so camp owners and operators can use large barracks-style rooms with rows of bunk beds without partitions even when housing multiple families, or families and unaccompanied workers.

*Lead.* Lead exposure is a common hazard in housing built before 1978. Many structures used as migrant labor camps housing predate 1978, but this is not addressed in OSHA standards. The Housing Assistance Council has noted that the prevalence of peeling exterior and interior paint (in migrant farmworker housing) raises the possibility of lead poisoning, particularly when children are present.[43] The health consequences of lead exposure can be severe, especially for children, and can include alteration of the central nervous system, anemia, fatigue, coma, and convulsions. This risk can be minimized by stabilizing surfaces with deteriorated paint surfaces, disclosing known lead-based paint hazards, and providing educational materials.

*Freedom of association.* Farmworkers have the human need to communicate freely with their families and others. A 2008 study of the mental health of male migrant farm laborers found that social isolation was associated with anxiety.[44] Camp occupants often are isolated from social support and assistance. Current regulations do not require access to telephone service, nor prohibit camp owners' or operators' interference with camp residents' in-person communication with nonresidents. Many farmworkers now have and use cell phones, but many labor camps are located in areas without cell phone service and thus need telephone service. Stress levels are heightened if farmworkers have no way to communicate with the outside world unless their employer is the intermediary. Many residents lack transportation to seek medical assistance or other help.

Far too many camp owners and operators attempt to control camp occupants' ability to receive visitors.[45] They attempt to prevent people such as migrant health care providers, migrant education personnel, legal aid program staff, and persons from religious organizations from entering camps to offer information and assistance. No farmworker should have to renounce

the fundamental right to free association because he or she resides in a labor camp.

*Neighborhood conditions.* Farmworker housing is located in varied settings, from isolated camps to urban neighborhoods.[1] Conditions beyond the housing property lines, but in the immediate neighborhood, independently affect farmworker health. Health conditions (e.g., mental health and obesity) are associated with lack of infrastructure, the social and economic environment, proximity to hazardous or toxic sites, and population density.[46]

Densely settled, underserved communities are located in rural areas or on the fringe of municipalities, and sometimes even surrounded by municipalities. These excluded communities home to many farmworkers, often lack public water, sewer, streetlights, storm water drainage, and other fundamental amenities.[27,47] A major analytic issue in many studies of this phenomenon is the intertwining health effects of poverty, social conditions, and housing conditions. The National Academies acknowledged the difficulties in untangling these factors in 2008 and recommended that "NIOSH pursue such effort without further delay".[4]

## Next Steps

Farmworkers and their families will continue to reside in substandard housing, and the adverse consequences to their health and well-being will remain unchecked unless sufficient steps are taken to ensure change. Next steps must include adequate scope and enforcement of standards applicable to all of the housing in which farmworkers reside, improvement of the physical conditions of existing farmworker housing and the infrastructure serving it, and removing toxins within and near it. The impact of substandard conditions on farmworker health and public health must be addressed in both establishing and enforcing governing standards, and consistency must be required in the application of those standards. Finally, sufficient resources must be assured to develop new housing, suitable for farmworkers and their families. The following list includes minimum efforts needed to correct these inequities:

- Appropriate standards, sufficient resources, and common research measures must be provided to address existing farmworker housing conditions and to ensure the availability of decent, affordable farmworker housing;
- Research should be funded and conducted to document the connection between housing conditions and health, including assessments of dwelling conditions, the surrounding environment, and the cost of substandard farmworker housing to public health, health care, enforcement, education, social fabric, and the economy;

- A data collection system should be developed to effectively monitor effects of substandard housing on the health of farmworkers and their families and to provide more detailed, focused information to develop and target regulations;
- Training about the health risks of substandard farmworker housing should be developed and implemented for health care providers, code enforcement officials, and personnel in other related agencies; and
- Financial incentives for appropriate agencies, nonprofit developers, and employers should be available to underwrite and develop affordable high-quality farmworker housing.

## Conclusion

The current federal regulatory scheme for farmworker housing is deficient and deleterious to the health and well-being of many farmworkers and their families. The evidence linking housing conditions and health risks for farmworkers and their families is growing, but it is not adequately addressed in the existing federal regulatory structure, much less in its enforcement. Farmworkers and their families are the most exploited workforce in the country, suffering from unsafe housing, a lack of workplace health and safety, employment and housing discrimination, inadequate schools, and lack of sufficient health care. They must not pay with their health to put food on our tables. An adequate supply of decent affordable housing for farmworkers could address some of these ills in an effective manner and an effective regulatory environment could speed the development of safe, high-quality housing for farmworkers.

The current risks are numerous, but they can be addressed.

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