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SAFETY, SECURITY, HYGIENE AND PRIVACY IN MIGRANT FARMWORKER HOUSING

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Abstract

Safety, security, hygiene, and privacy in migrant farmworker housing have not previously been documented, yet these attributes are important for farmworker quality of life and dignity. This analysis describes the safety, security, hygiene, and privacy of migrant farmworker housing and delineates camp characteristics that are associated with these attributes, using data collected in 183 eastern North Carolina migrant farmworker camps in 2010. Migrant farmworker housing is deficient. For example, 73.8 percent of housing had structural damage and 52.7 percent had indoor temperatures that were not safe. Farmworkers in 83.5 percent of the housing reported that they did not feel they or their possessions were secure. Bathing or toileting privacy was absent in 46.2 percent of the housing. Camps with residents having H-2A visas or North Carolina Department of Labor certificates of inspection posted had better safety, security, and hygiene. Regulations addressing the quality of migrant farmworker housing are needed.

Keywords

migrant farmworker; housing quality; occupational justice

Migrant farmworkers in the United States are a vulnerable population who are exposed to a wide variety of environmental and occupational hazards [1, 2]. The housing in which migrant farmworkers live is a major source of exposures over which they have little control [3]. Federal and state regulations have been developed to ensure adequate and safe housing for migrant farmworkers, yet analyses show that adherence to these regulations is often limited [4, 5].

Housing quality is related to the physical, psychological, and emotional health and well-being of its inhabitants [6, 7]. A dwelling's physical attributes can result in exposure to

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hazards that increase the risk of immediate injury and illness (e.g., chemical-related illness, respiratory conditions, lacerations, electrocution) and long-term disability (e.g., asthma, neurobehavioral disability) [8, 9]. Similarly, the physical and social attributes (e.g., crowding) of a dwelling can result in declines in mental and emotional health [10]. Housing quality is one of the factors that increases the health disparities experienced by populations such as migrant farmworkers.

Migrant farmworkers are individuals who establish a temporary residence for the purpose of employment in agriculture on a seasonal basis. Migrant farmworkers may move within a state, between states, or internationally. Migrant farmworkers in the United States number in the hundreds of thousands, but their exact number is not known [11]. Most migrant farmworkers are men who are working in the United States without their families [12]. Migrant farmworkers in the United States are largely Latino immigrants, with the majority coming from Mexico [12]. Many farmworkers have little formal education. An increasing number of migrant farmworkers speak an indigenous language rather than Spanish as their primary language [12–14]. About one-half of migrant farmworkers do not have the appropriate documents to work in the United States [12]. The H-2A visa program is a current agricultural guest-worker program that allows individuals to work for a specific agricultural employer for a determined period; individuals with H-2A visas must return to their home nation each year [15].

Little information is available to document the actual living conditions of migrant farmworkers. Several investigators have studied conditions in housing in which seasonal farmworkers live [16–20]. Like migrant farmworkers, seasonal farmworkers are largely Latinos, many of whom are immigrants from Mexico and other Central American countries. Unlike migrant farmworkers, seasonal farmworkers often reside with their families and the housing in which they live is not subject to the same Occupational Safety and Health Administration (OSHA) or state regulations [3].

Three analyses provide information about housing quality for migrant farmworkers. Ziebarth [21] reports that migrant farmworkers in Minnesota make negative comments about the bathroom (26%), kitchen (18%), water quality (11%), crowding (13%), lack of privacy (6%), and need for repairs (7%) in the houses in which they live. She concludes that migrant farmworkers live in substandard housing and endure severe housing difficulties. Vallejos and colleagues [4] report that substandard housing is common in North Carolina migrant farmworker camps. At times during the agricultural season, up to 44 percent of migrant farmworker camps had inadequate bathing, laundry, or storage facilities. Arcury and colleagues [5] describe the conditions that violate migrant farmworker housing regulations in North Carolina. They found that violations of these regulations are common, with a mean number of 11.4 violations per camp (range from 4 to 22 violations of 39 regulations considered). The violations are common across all areas of the camps, with the mean number of sleeping room violations at 3.8; bathroom violations, 4.5; kitchen violations, 2.3; laundry room violations, 1.2; and general housing violations, 3.1. Camp characteristics associated with fewer violations include having residents with H-2A visas, having a North Carolina Department of Labor (NCDOL) certificate of inspection posted, and having been assessed early in the season.

Research has not documented migrant farmworker housing attributes that affect their quality of life and personal dignity. These attributes include the safety, security, hygiene, and privacy present in migrant farmworker housing. Without such research, the rights and dignity of migrant farmworkers will continue to be abridged, as few data are available to counter those who argue that current housing conditions are acceptable and that change is not needed.

This analysis builds on ongoing community-based participatory research and collaboration with migrant farmworker communities in North Carolina to document the quality of the housing in which they live. An earlier analysis [5] focused on the extent to which migrant farmworker housing in North Carolina violates state regulations. The present analysis has two aims. The first aim is to describe the attributes of migrant farmworker housing—including safety, security, cleanliness, and privacy—that reflect quality of life and personal dignity. The second aim is to delineate farmworker camp characteristics that are associated with safety, security, cleanliness, and privacy in migrant farmworker housing.

METHODS

Locale

The research was conducted in a 16-county area of east-central North Carolina in which a large number of migrant farmworkers are employed. The counties are Caswell, Craven, Cumberland, Duplin, Edgecombe, Greene, Halifax, Harnett, Johnston, Lenoir, Nash, Person, Sampson, Wake, Wayne, and Wilson. These counties are served by four organizations that participated in the research: North Carolina Farmworkers Project, Carolina Family Health Center, Kinston Community Health Center, and Piedmont Health Services.

Sample

This research focused on housing occupied by migrant farmworkers. All participants in this research resided in employer-provided housing, which is generally referred to as a “camp.” In North Carolina, virtually all migrant farmworkers reside in employer-provided housing. Lists of camps were obtained from the partner organizations. Over the course of data collection, the list of camps was expanded as new camps were encountered. All identified camps were contacted to participate in the study. Project field staff traveled to the camps and explained the nature of the study to residents. If camp residents agreed to participate in the study, a camp census was conducted to assess general camp characteristics and to determine eligibility. A total of 186 camps were enrolled in the study. Residents in an additional 36 camps declined to participate, and the grower refused to permit participation in another four camps. The resulting camp participation rate was 82.3 percent (186/226). Data collection was not completed in five of the186 participating camps due to intervention by the grower. For three of these camps, insufficient information was collected on adherence to housing regulations and they could not be included in this analysis. Therefore, the final sample for this analysis consisted of 183 camps. Each camp that participated in the study was given a volleyball as a token of appreciation.

Three residents of each camp were selected as participants. Inclusion criteria were being male, being currently employed as a farmworker, migrating for employment, and residing in the camp. Two residents were asked to complete an interview questionnaire, help with assessing their sleeping rooms, and provide biological samples. One resident was asked to help with a camp and housing assessment. The final sample included 371 men who completed interviews and 182 men who assisted in the camp assessments; 231 men refused to participate when asked. The participation rate was 70.5 percent (553/784); however, the true rate could be lower, as individuals who did not want to participate could have avoided the recruiters. Each participating camp resident was given a $30 cash incentive.

Data Collection

Two procedures were used to collect data used in this analysis: interviews completed with the two residents in each participating camp; and the camp assessment conducted with the assistance of a resident farmworker. Data collection forms were developed in English and translated into Spanish by a native Spanish speaker familiar with Mexican Spanish. The

forms were reviewed by staff members of the community partners who were native Spanish speakers. Revised forms were field-tested, with the interview questionnaires being pretested with four male migrant farmworkers. All materials were revised based on the field test.

Interviews were completed by trained staff members who were fluent Spanish speakers. Interviews were completed in a location in which the participant was comfortable, generally their sleeping room. Interviews assessed demographic information, housing features, and perceptions of housing quality. Farmworkers who completed the interviews helped with an assessment of their sleeping rooms. Interviews took approximately 90 minutes to complete.

Housing assessments were completed by trained staff members who were fluent Spanish speakers with the assistance of a farmworker. The housing assessment form included 129 items. The inspector observed, asked questions, and used instruments such as a flashlight and an extending mirror to inspect inside cabinets and behind appliances for signs of pest infestation and exposed wires. The housing assessment form consisted of five sections: 1) general camp; 2) toilet facilities; 3) bathing and showering facilities; (4) kitchen/eating area; and 5) laundry facilities. Inspections took 60 to 90 minutes to complete. Housing assessments also included recording temperature and relative humidity in participants' sleeping rooms and a common room using a hygrometer, with measurements taken three times consecutively.

Measures

Housing safety, security, hygiene, and privacy were the foci for this analysis. Housing safety included three dichotomous measures of structural problems: 1) the presence of water damage in either of the participants' sleeping rooms; 2) the presence of holes or other damage in dwellings' floors, walls, or ceilings; and 3) the presence of leaks when raining. A final measure was the sum of the three individual structural problems. Housing safety also included measurement of temperature in the participants' sleeping rooms. The heat index was based on room temperature, and had four values: 1) no danger, heat index < 80; 2) caution, heat index ≥ 80 and < 90; 3) extreme caution, heat index ≥ 90 and < 105; and 4) danger, heat index ≥ 105.

Housing security measures addressed feeling secure, locks for the dwelling, storage, and communication. The first measure of housing security was based on participants' responses to an interview item which asked how secure the doors and windows of their dwelling were for protecting their belongings and themselves ("¿Qué tan seguras son las puertas y ventanas de su vivienda para proteger sus pertenencias (ejemplo: dinero, documentos) y usted?"). If either of the two interview participants answered, "not secure," the camp was coded as "belonging and self are not secure." Measures of dwelling locks included whether participants had a key to the exterior doors of their dwelling, whether the dwelling doors had locks, and whether the dwelling windows had locks. A final measure was the sum of the three individual lock measures. Measures of storage included whether the participants felt they had sufficient space for storing personal items, sufficient space for storing food in the refrigerator, and sufficient space for storing food and cooking equipment in the kitchen. A final measure was the sum of the three individual storage measures. Measures of communication included whether participants had access to a phone for emergencies, had access to a phone for personal calls, or had limited phone access; and whether a mobile signal was always available.

Hygiene measures addressed cleanliness, odor, and drinking water. A lack of cleanliness was assessed using eight dichotomous measures: whether the camp was unclean upon participants' arrival, and, at the time of the inspection, the bathroom was not clean, the shower had mold, the kitchen was not clean, the buildings had roach infestation, the

buildings had mouse infestation, the outside trash receptacles were without tight-fitting lids, and a working washing machine was not available. These were summed to a total score, with lower scores indicating cleaner housing. An additional measure was the sum of the eight individual hygiene measures. Odor included two dichotomous measures: whether participants, while in the camp, could smell animals in a nearby concentrated animal feeding operation (CAFO); and whether their sleeping room had a musty or mildew smell. The survey included a dichotomous measure of whether the participants drank the tap water in their camp; participants who did not drink the tap water were also asked whether each item on a list of possible concerns was a reason that they did not drink the tap water.

A single measure of privacy concerns was constructed with the values: no privacy concerns, one privacy concern, two privacy concerns, and three or four privacy concerns. Camps were rated as having one privacy concern for each of the following: if the toilets were not separated by a solid barrier, if toilets did not have doors or curtains, if showers were not separated by a solid barrier, and if showers did not have doors or curtains.

Eight camp characteristics were included as predictors in this analysis. H-2A status was a dichotomous measure indicating whether any farmworkers with H-2A visas were living in the camp. Housing type had the values: any barracks in the camp versus no barracks in the camp. Camps with barracks could also have non-barrack housing, such as houses and trailers. Non-barracks camps had only houses or trailers. Number of camp residents was classified into three categories: 1 to 10, 11 to 20, and 21 or more. Number of housing units in the camp had the values 1, 2, and 3 or more. Presence of female residents was a dichotomous measure, as was the presence of a posted NCDOL certificate of inspection. All camps inspected by the NCDOL should post the certificate of inspection; as all of the camps included in this study housed migrant farmworkers, all should have been inspected. Hidden camp is a dichotomous measure: a camp was classified as hidden when it was obstructed from view from any public road by natural or constructed structures (e.g., dense trees, barns), or more than 0.15 miles from any public road. The hidden status of each camp was based on direct observation by the project data collection teams to indicate whether the camp was obstructed from view, and information from Google Earth satellite imagery to indicate whether the camp was more than 0.15 miles from any public road.. Geographic information system (GIS) software (ESRI ArcInfo (Version 9.3 ESRI Redlands, CA; Google Earth Pro, Mountain View, CA; and Atlas. ti 6.0; Cologne, Germany) were used in providing the analysis for this measure. The final measure was data collection period, which had the values of early season (June through mid-July), mid season (mid-July through August), and late season (September and October).

Analysis

Descriptive statistics were used to describe the various camp characteristics. Bivariate associations of discrete housing quality attributes with camp characteristics were assessed using chi-square tests or Fisher's exact tests when necessary. Continuous housing quality attributes whose distributions were approximately normal were examined using analysis of variance (ANOVA). All statistical analyses were performed using SAS 9.2 (Cary, NC). A p-value of less than 0.05 was considered statistically significant.

RESULTS

Camp Characteristics

About two-thirds of the participating camps had residents with H-2A visas (Table 1). Housing in about one-third of the camps included a barracks. Almost half of the camps had 10 or fewer residents, with one-quarter having 11 to 20 residents, and one-quarter having 21

or more residents. A majority of camps (61.1%) had one housing unit, with one-fifth having two housing units, and one-fifth having three or more housing units. About one-quarter of the camps had female residents. About one-third had a NCDOL certificate of inspection posted. More than one-third of the camps were hidden. About one-quarter (28.5%) of the camps were assessed in the early season, 44.6 percent in the mid season, and 26.9 percent in the late season.

Housing Quality

The housing provided to farmworkers had shortcomings in safety, security, cleanliness, and privacy (Table 2). In terms of safety, sleeping rooms in most of the camps had water damage. Almost three-quarters of the camps had housing with holes or other structural damage. About 20% of the camps had housing that leaked when it rained. The heat index measured in the housing presented no danger in 12.2 percent of the camps, while in 35.0 percent of camps it warranted caution, in 44.4 percent of the camps it warranted extreme caution, and in 8.3 percent of the camps it was dangerous.

Most of the farmworkers did not feel that their belongings or self were secure. Farmworkers in fewer than one-third of the camps had keys to the exterior doors of their housing. Twenty-one percent of camps had housing without locks on the doors, and one-quarter had windows without locks. Almost three-quarters of the camps had insufficient storage for the farmworkers' personal possessions (Figure 1). One-quarter of the camps had insufficient refrigerator storage, and one-quarter had insufficient kitchen storage. Farmworkers in almost all of the camps had emergency telephones available. Almost all also had telephones available for personal use, and few had limited telephone access. However, in one-third of the camps, mobile telephone signal was not always available.

Cleanliness was lacking across the camps. Farmworkers in 27.3 percent of the camps did not feel the camps were clean when they arrived. Bathrooms in 28.4 percent of the camps were not clean when they were inspected, and showers in 35.0 percent of the camps had mold (Figure 2). Kitchens in 20.8 percent of the camps were not clean when they were inspected (Figure 3). Almost three-quarters of the camps had signs of roach infestation (Figure 4), and 55.2 percent had signs of mouse infestation. Outside trash receptacles did not have tight-fitting lids in 42.6 percent of the camps (Figure 5). Working washing machines were not available in 42.1 percent of the camps. Farmworkers in 6.0 percent of the camps reported animal smells. Sleeping rooms had a musty smell in 18.6percent of the camps. Toilet or shower privacy was lacking in 42.6 percent of the camps (Figure 6).

Farmworkers in 56 (30.9%) of the camps reported not drinking the tap water (Table 3). Reasons given for not drinking the tap water included concerns about chemical (13.3%) and biological contamination (6.1%). Bad taste (15.5%), bad odor (7.7%), discoloration (5.0%), and the presence of sediment (4.4%) were also given as reasons for not drinking the tap water.

Relationship between Housing Quality and Camp Characteristics

The total number of structural problems was consistent across all of the camp characteristics. The feeling of belongings and self not being secure, and the absence of locks were also consistent across the camp characteristics. Finally, the presence of animal odors and musty or mildew smells was consistent by camp characteristics.

In contrast, other housing quality attributes were related to the key camp characteristics. The heat index was greater in camps assessed in the mid-season (July and August) than in those assessed in the early or late season: the heat index was at the danger level in 13.6 percent (n=11) of camps assessed in the mid-season, compared to 8.0 percent (n=4) of those

assessed in the early season and none of the camps assessed in the late season ($p < 0.001$). Almost three-quarters of camps in which at least some residents had H-2A visas always had a mobile signal available (71.2%, n=86) compared to only about half of camps in which no residents had H-2A visas (55.2%, n=32) (p=0.042).

The camp's total score on lack of cleanliness was related to several camp characteristics. The mean score was lower (that is, conditions were cleaner) in camps with residents having H-2A visas (2.9) than in those in which no residents had H-2A visas (4.1) ($p < 0.0001$); in camps with no barracks (3.0) than in those with barracks (3.7) (p=0.022); and in camps with one housing unit (3.0) than in those with two housing units (3.3) or three or more housing units (4.0) (p=0.033). Similarly, the mean score on lack of cleanliness was lower in camps with an NCDOL certificate of inspection posted (2.8) than in those without the certificate posted (3.5) (p=0.022); in camps that were not hidden (3.0) than in those that were hidden (3.7) (p=0.013); and in camps assessed in the early season (2.3) than in those assessed in the mid-season (3.6) or late season (3.6) (p=0.0002). In contrast, camps with female residents present had higher mean scores for lack of cleanliness (3.9) than those with no female residents (3.0) (p=0.012).

The number of toilet and shower privacy concerns reported was also related to camp characteristics. Camps with no barracks had fewer privacy concerns (96, or 75.0%, with no privacy concerns; five, or 3.9%, with three or more privacy concerns) compared to camps with barracks (nine, or 16.4%, with no privacy concerns; 10, or 18.2%, with three or more privacy concerns) ($p < 0.0001$). Smaller camps also had fewer privacy concerns: 72 camps (80.9%) with 10 or fewer residents had a privacy score of zero, compared to 25 camps (53.2%) with 11 to 20 residents, and eight camps (17.0%) with 21 or more residents ($p < 0.0001$). Of the camps with one building, 72 (63.7%) had a privacy score of zero, compared to 21 (58.3%) of those with two buildings, and 12 (35.3%) of those with three or more buildings (p=0.002). Finally, camps that were not hidden had better privacy scores (74, or 67.3%, had a score of zero) than hidden camps (26, or 38.8%, had a score of zero).

More workers in camps in which at least some residents had H-2A visas drank the tap water (97, 78.9%) compared to camps in which no residents had H-2A visas (28, 48.3%) ($p < 0.0001$). More workers in camps having no female residents drank the tap water (101, 73.7%) compared to camps having female residents (24, 54.5%) (p=0.022).

DISCUSSION

Housing safety, security, hygiene, and privacy may affect the quality of life and personal dignity of migrant farmworkers. For example, quality of life is lessened when holes are present in the walls of the room in which one sleeps, the ceiling leaks when it rains, or the temperature is so hot as to be dangerous; personal dignity is lessened when personal belongings must be piled on the floor and no privacy is available when bathing or using the toilet. This analysis found that much of migrant farmworker housing in eastern North Carolina is deficient in the domains of safety, security, hygiene, and privacy. Structural problems were present in almost all of the buildings. The heat index was generally uncomfortable, if not dangerous. Farmworkers did not feel secure for their safety or that of their possessions. Few farmworkers had a key to the exterior door for the building in which they lived; often these buildings did not have door or window locks. Farmworkers seldom had sufficient storage for their personal possessions, and often did not have sufficient storage for their food. A lack of cleanliness in kitchens, in bathrooms, and in the general camp was common. Over 40 percent of the camps did not provide privacy for farmworkers when bathing or toileting. Despite these shortcomings, not all of the camps assessed had poor-quality housing. Housing in several of the camps was in excellent repair, providing a

safe, clean, and private environment for farmworkers. The presence of this good-quality housing in some of the camps highlights the potential for such housing in all of the camps.

The housing provided to migrant farmworkers in North Carolina is an important component of their compensation and of their work environments. The lack of safety, security, hygiene, and privacy experienced by many of these migrant farmworkers can affect their mental and physical health [22]. The housing provided to many migrant farmworkers in North Carolina is an occupational injustice [23].

Findings in Context

The housing attributes reported here reflect the existing literature on farmworker and migrant farmworker housing. For example, the Housing Assistance Council [24] found that over half of farmworker housing was crowded; 22 percent of housing units lacked a toilet, bathtub, stove, or refrigerator; 22 percent had serious structural damage; 36 percent had broken windows or torn screens; 29 percent had evidence of water leakage; and 19 percent had signs of rodent or insect infestation. The Housing Assistance Council included migrant and seasonal farmworker housing in their analysis. Their results were based on data collected in the 1990s and were not peer-reviewed. Documentation of migrant farmworker housing conditions is limited. These earlier studies in Minnesota [21] and North Carolina [4] reported conditions that reflected a lack of safety, security, hygiene, and privacy. Our previous analysis of these data considered housing attributes that reflected formal regulations [5]. This analysis adds to the literature on migrant farmworker housing by considering attributes that reflect general quality of life and personal dignity, rather than merely regulatory standards. This analysis is also based on a relatively large sample of farmworker camps, and it considers a broad range of housing quality attributes.

Some camp characteristics were associated with the measures of housing quality attributes. The most consistent of these was the presence of farmworkers with H-2A visas. Camps in which at least some residents had H-2A visas had better cell-phone access, they were cleaner, and more workers drank the tap water. Camps in which a NCDOL certificate of inspection was posted were cleaner than other camps. Other camp characteristics related to *less* cleanliness were having barracks, being larger (greater number of units), having women present, and being hidden. The association of better housing conditions with the presence of farmworkers having H-2A visas reflects previous analyses [25, 5] as does the association with having a posted NCDOL certificate of inspection [5]. The association between the presence of women in the camps and less cleanliness may reflect the fact that women are not recruited by the H-2A visa program, and, as a result, some women may be forced to reside in camps of lesser quality and in camps that are less likely to be inspected by NCDOL.

The association between the presence of barracks, as well as larger camp size, and worse conditions is not consistent across studies. Vallejos and colleagues [4] report that camps with more residents (11 or more versus 10 or fewer) have worse sleeping room (crowding), bathroom conditions (number of showerheads), and general facility conditions. However, Arcury and colleagues [5] report that camps with barracks had fewer housing regulation violations. The characteristics of barracks and larger camps may be related. These are camps in which housing was built specifically for farmworkers. Therefore, they are often built to meet regulations. However, several conditions considered in this analysis, such as privacy in bathing and toilet facilities, are not included in housing regulations. Therefore, large camps with barracks, although meeting regulations, may not provide the same level of privacy that is present in a small camp in which the housing is an old farmhouse or trailer. The old farmhouse or trailer may have only one bathroom (which increases the chances that it does not meet regulations for number of toilets and shower heads), but the one bathroom has a door for privacy.

The general access to telecommunication for migrant farmworkers indicates a great improvement over previous research, which found that migrant farmworkers had limited access to telephones and that this limited access was associated with poor mental health [26]. However, it does not appear that the increased access to telephones was provided by the employers who own the camps. Rather, migrant farmworkers have addressed this problem by purchasing cell phones.

This study should be evaluated in terms of its limitations. The data came from one region of one state in one year. The history of migrant farmworker housing is different for other regions [27]; therefore, generalizations to other regions should be made with caution. This study used a cross-sectional design; therefore, causal relationships can only be inferred. Although all identified migrant farmworker camps were asked to participate in the study, not all migrant farmworker camps were identified; the conditions in unidentified camps may differ from those in the camps identified for the study. Data collectors were not allowed into a number of camps; the conditions in these camps may have been either better or worse than those in the camps that participated in the study. Finally, farmworkers who volunteered to participate in the study may differ from those who did not volunteer.

This study also has several strengths. Data were collected at a large number of camps representative of the agricultural region of eastern North Carolina, ensuring an accurate view of the housing conditions for migrant farmworkers. The data collectors for this study were familiar with the farmworker communities. This allowed access to the majority of camp sites and uninhibited data and sample collection during the camp visit.

Implications

The results of this analysis have implications for migrant farmworker housing policy and practices. These results indicate the need to enforce existing regulations. A previous analysis documents widespread violation of migrant farmworker regulations in North Carolina [5]. Several housing attributes included in this analysis, such as the walls and ceiling being in good repair, adequate storage for personal belongings, a lack of cockroach infestation, and exterior trash containers with tight-fitting lids are addressed by current migrant housing legislation [28]. Adequate resources must be provided so that these regulations are enforced. As noted in previous reports [5], fewer than 10 housing inspectors are employed by NCDOL to inspect all of the migrant farmworker housing across the entire state. This number is not adequate to complete pre-occupancy inspections currently required by migrant housing regulations; and inspections cannot be conducted when migrant farmworkers are present. Post-occupancy inspections are needed to ensure that migrant farmworker housing is maintained in good repair across the entire season. More rigorous enforcement of housing standards should be supported with penalties that are sufficient to serve as deterrents.

These results also demonstrate the need to expand current migrant housing regulations so that farmworkers are provided at least a minimum in quality of life and personal dignity. For example, in terms of current regulations, mold-covered walls in a shower are not a violation, although they are a health and cleanliness hazard. Migrant farmworkers need to be given the resources to keep their bathing facilities clean. These resources could include cleaning supplies and the time to clean, or a cleaning service. Current housing regulations require only a minimum number of bathing and toileting facilities: one showerhead for every 10 workers, and one toilet for every 15 workers. These regulations do not require privacy for showers or toilets. Given that few people want to shower or sit on a toilet in the company of others, regulations guaranteeing privacy to farmworkers must be implemented.

Regulations, when they are enforced, improve the lives of farmworkers. Safety, security, and hygiene were better in camps in which workers with H-2A visas lived and in which a

NCDOL certificate of inspection was posted. Violations of housing regulations also were fewer in camps in which workers having H-2A visas lived and in which NCDOL certificates of inspection were posted [5]. Employers of workers with H-2A visas adhere more to regulations for pesticide safety and for paying appropriate wages than do other agricultural employers [5, 29]. Employers with workers having H-2A visas are monitored for adherence to regulations by the H-2A visa programs of which they are members and by the Farm Labor Organizing Committee (FLOC). FLOC has a union contract with most employers who hire workers with H-2A visas in North Carolina. Employers who do not adhere to regulations can be held responsible by this union, and they may be denied the opportunity to hire workers with H-2A visas in the future. More rigorous enforcement should be supported with penalties that are sufficient to serve as deterrents.

CONCLUSION

Much of migrant farmworker housing in eastern North Carolina is deficient in the domains of safety, security, hygiene, and privacy. These housing conditions may affect farmworker quality-of-life and dignity. The housing provided to migrant farmworkers is a component of their work environment and of their compensation; the poor quality of the housing in which migrant farmworkers must live is an occupational injustice. Safety, security, and hygiene were better in camps in which workers having H-2A visas lived and in which NCDOL certificates of inspection were posted. Current housing regulations should be expanded to address safety, security, hygiene, and privacy in migrant farmworker housing. The program of community-based participatory research of which this analysis is a part continues to provide a foundation of systematically documented information on which the policy needed to improve the work and living environments of migrant farmworkers can be based.

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Figure 1.
Migrant farmworker sleeping room showing lack of adequate storage, Eastern North Carolina, 2010.

Figure 2.
Migrant farmworker shower showing accumulation of mold, Eastern North Carolina, 2010.

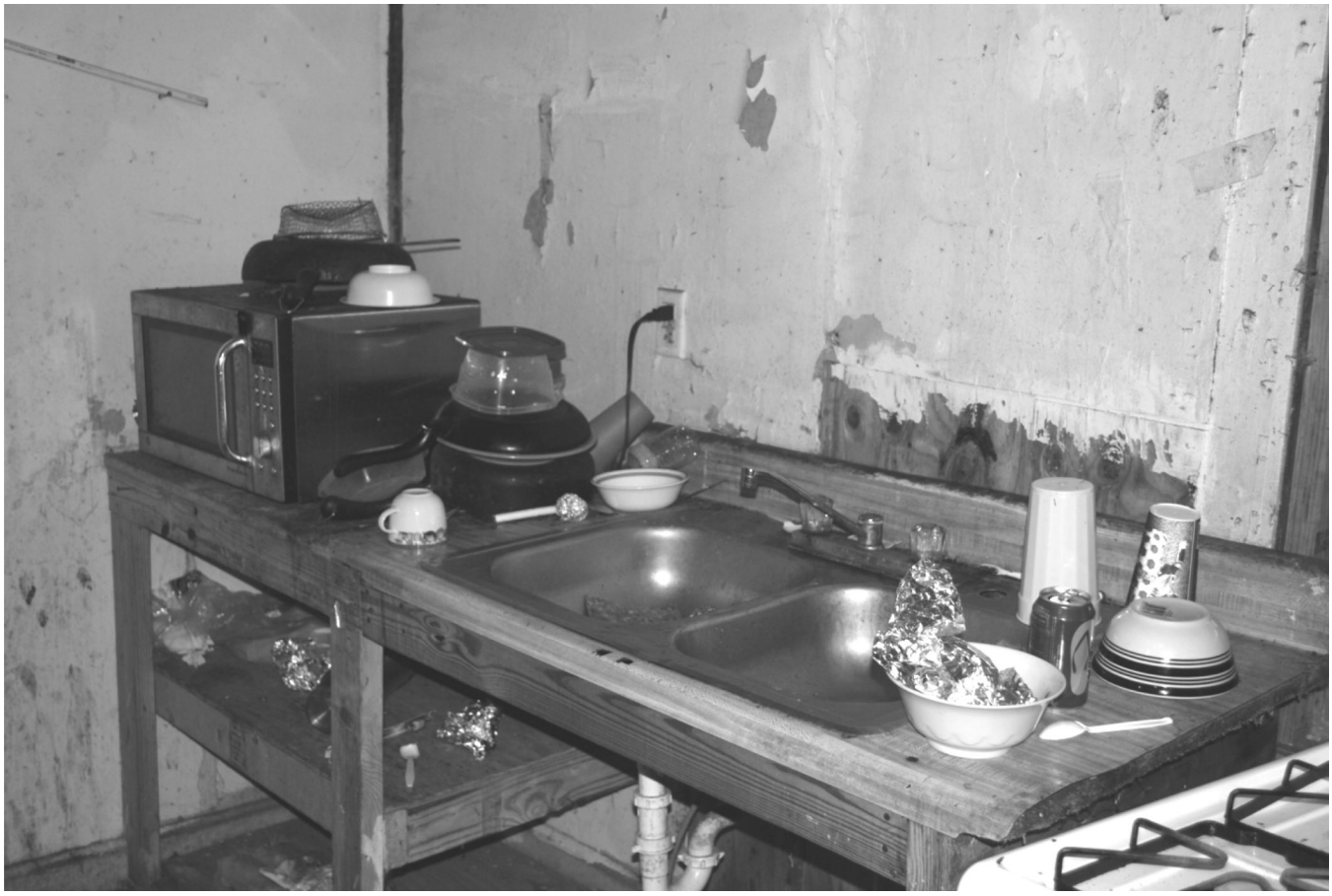

Figure 3.
Migrant farmworker kitchen showing lack of adequate storage and lack of cleanliness, Eastern North Carolina, 2010.

Figure 4.
Cockroaches found in migrant farmworker kitchen, Eastern North Carolina, 2010.

Figure 5.
Exterior trash container without a tight-fitting lid, migrant farmworker camp, Eastern North Carolina, 2010.

Figure 6.
Migrant farmworker bathroom showing lack of privacy for toilets, Eastern North Carolina, 2010.

Table 1

Characteristics of Migrant Farmworker Camps, Eastern North Carolina, 2010 (n=183)

Camp Characteristics	*n*	%
Camps with H-2A Visas Present	125	68.8
Housing Type		
Barracks present	55	31.1
No barracks present	128	69.9
Number of Camp Residents		
1 to 10	89	48.6
11 to 20	47	25.7
21 or more	47	25.7
Number of Camp Housing Units		
1 housing unit	113	61.1
2 housing units	36	20.0
3 or more housing units	34	18.9
Female Residents	44	24.7
NCDOL Certificate of Inspections Posted	62	34.4
Hidden camps	67	37.9
Data Collection Period		
Early season (June - mid July)	51	28.5
Mid season (mid July - August)	83	44.6
Late season (September - October)	49	26.9

Table 2

Housing Quality Indicators in Migrant Farmworker Camps, Eastern North Carolina, 2010 (n = 183)

Housing Quality Indicators	*N*	%	mean	SD
Structural Problems				
Water damage in sleeping room	96	52.5		
Holes or other damage in floors, walls, or ceiling	127	69.4		
Dwelling leaks when it rains	36	19.7		
Total Structural Problems			1.4	0.9
Heat Index				
No danger	22	12.2		
Caution	63	35.0		
Extreme caution	80	44.4		
Danger	15	8.3		
Feeling Secure				
Belongings and self are not secure	156	85.2		
Locks				
No key to exterior doors	127	69.4		
Dwelling doors do not lock	38	20.7		
Dwelling windows do not lock	44	24.0		
Total Locks			1.1	0.9
Storage				
Insufficient personal storage	131	71.6		
Insufficient refrigerator storage	47	25.6		
Insufficient kitchen storage	46	25.1		
Total Storage Score			1.2	1.0
Communication				
Insufficient emergency phone	8	4.4		
Insufficient phone for personal calls	10	5.6		
Limited phone access	10	5.6		
Mobile signal not always available	61	33.3		
Lack of cleanliness				
Camp not clean upon arrival	50	27.3		
Bathroom not clean	52	28.4		
Shower mold	64	35.0		
Kitchen not clean	38	20.8		
Roach infestation	133	72.7		
Mouse infestation	101	55.2		
Outside trash receptacles without tight-fitting lids	78	42.6		
Working washing machine not available	77	42.1		
Total Cleanliness Score			3.2	1.9
Odor				
Animal smell in camp from CAFO	11	6.0		

Housing Quality Indicators	*N*	%	mean	SD
Musty or mildew smell in sleep room	34	18.6		
Toilet and Shower Privacy Concerns				
No privacy concern	105	57.4		
One privacy concern	34	18.6		
Two privacy concerns	29	15.8		
Three or four privacy concerns	15	8.2		

Table 3

Drinking Water Concerns in Migrant Farmworker Camps, Eastern North Carolina, 2010 (n = 181)

Drinking Water Concerns	*n*	%
Does Not Drink Tap Water	56	30.9
Reasons for Not Drinking Tap Water		
Chemical contamination	24	13.3
Biological contamination	11	6.1
Bad taste	28	15.5
Bad odor	14	7.7
Discolored	9	5.0
Sediment	8	4.4
Other reasons	16	8.8