Migrant Farmworker Sampling Methodology:

Strategies for Collecting Data in Migratory/Mobile Groups To Reduce Tobacco-Related Health Disparities

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"There is enormous potential to reduce heart disease, cancer, stroke, and respiratory disease among members of racial and ethnic groups, who make up the most rapidly growing segment of the United States population."

Surgeon General's Report, 1998

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September 1, 2011

While much useful research has been generated over the last decade, scientists still struggle with basic questions about how to study migrant farmworkers. Researchers and community advocates interested in uncovering the toll that farm work, and the added burden of tobacco use, takes on migrant farmworker populations face unique challenges. The nature of farm work in this nation means that the living and working patterns of farmworkers are not always amenable to standard survey methods; instead, scientists must develop innovative, context-sensitive approaches to studying this group. At the heart of this challenge is the very mobility of these workers, who travel both within the U.S. and across national borders to follow seasonal work.

How can we, as social scientists, design research strategies that not only reach a representative sample of migrant farmworkers but successfully follow them over time? How can we develop methodologies that will allow us to assess the impact of tobacco on this population? And how can these methodologies account for the differences within migrant populations—and agricultural production practices—within the various regions of the United States? These questions served as the organizing force behind the gathering of a number of researchers from a variety of disciplines in Los Angeles in March 2008. During this meeting, I had the pleasure and honor of working with a number of scientists whose own work has already made significant inroads into the study of migrant farmworker health. Together we considered the current best thinking on studying migrant populations and worked to push that thinking forward in further research on tobacco use among migrant workers.

It is with great pleasure that I present the report from that meeting. It is my hope that this document will be useful for researchers and community health advocates seeking to further our shared knowledge of migrant health and that this knowledge will, in turn, provide us with tools to address tobacco use and other health problems among migrant workers.

Sincerely,

Francisco O. Buchting

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Acknowledgements

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Executive Summary

Migrant farmworkers often face difficult and hazardous working conditions, a lack of health care and other benefits, and a hostile social and political environment. Tobacco use can place additional health burdens on this community. Very little research has been published on tobacco use in migrant farmworker communities. The research that has been conducted has shown smoking prevalence rates between 17% and 42% among migrant men. Tobacco use varies greatly by gender and may also be related to time spent in the U.S. In addition, some studies suggest that migrant youth may smoke at greater rates than their non-migrant counterparts. More research is essential to understanding the health burdens placed on migrant farmworkers.

Migrant farmworkers have often been considered a "hard to reach" population for research purposes. Researchers studying migrant worker populations must develop methods that take the mobility and working and living patterns of these groups into consideration.

This meeting was convened in order to:

- Identify obstacles/barriers in achieving adequate sampling of migrant farmworkers in research
- Summarize effective methodologies to adequately sample migrant farmworkers.
- Generate recommendations for carrying out robust research on migrant farmworkers.
- Address the question of whether methods need to be modified for conducting research on tobacco use in migrant farmworker populations.

Presentations and Discussions

The meeting began with a series of presentations and discussions addressing the state of knowledge on various topics relevant to sampling methodology in migrant farmworker populations.

Demographic characteristics of migrant farmworker communities. Varying definitions of "migrant farmworker" can hamper comparability of research. Migrant farmworkers can be defined based on industry, task, seasonality, and movement. Considering temporal aspects, questions of documentation, the definition of "household," and state and federal programmatic definitions further complicates the issue. While a uniform definition of "migrant farmworker" would allow for greater comparability, it would not account for the diversity of the migrant farmworker population or the varied aims of researchers.

A tool, such as a matrix or checklist of a multiplicity of terms and definitions could be used in planning and publishing research. Researcher could choose standard parameters and definitions from the matrix or list, preserving their flexibility to gear research to particular populations and questions, while at the same time allowing for comparability between studies.

Review of effective models/approaches to sample mobile/migratory farmworker populations. Employer-based sampling, household-based sampling, and network-based sampling have all been used to sample migrant farmworker populations. Each method has its benefits and limitations. Various sampling methodologies are appropriate depending on the farmworker demographics and mobility patterns, research question, and other characteristics. Respondent-Driven Sampling (RDS) may provide a useful tool for studying these populations. Regardless of sampling approach, it is essential to meaningfully involve community members in research.

Cultural, social, and environmental factors in conducting research in migrant farmworker communities. Cultural, social, and environmental factors must be taken into account in recruitment and sampling of migrant farmworker populations. Involving migrant farmworker communities in research projects can help locate and recruit participants and achieve adequate sampling. Issues to consider include language, years in the U.S., country of birth, acculturation, education, gender, and income. It is also important to consider fears and

sensitivities relating to anti-immigrant sentiment in the U.S., which can affect self image, access to resources, mental health, and other aspects of health. Notions of acculturation should be critically questioned in an era of globalization and consumerism; researchers should work to identify specific indicators and outcomes related to social, environmental, and cultural factors.

State of knowledge on tobacco use in migrant farmworker communities. Very little has been published on this topic, but the data that has been collected in a few studies suggests that migrant farmworkers can be understood as a light and intermittent smoking population. However, much more research is needed to draw any significant patterns. Age, years in the U.S., mobility, and gender may be associated with smoking behavior. The few published and unpublished studies on this topic do not use comparable definitions, making it harder to draw conclusions based on this data.

Recommendations

Meeting participants developed recommendations in four areas vital to ongoing research on migrant farmworker populations.

1. Addressing barriers to research on migrant worker populations:
    - Develop standard questions to further encourage comparability between studies.
    - Develop a tool (such as a matrix or checklist) to help ensure comparability of research.
    - Build funding stream for research on this population.
        - Identify new and nontraditional sources of funding (including federal funding, private foundations, and service providers).
        - Educate funders on the importance and feasibility of this work.
        - Partner with government and advocacy groups to fund and collaborate on projects that translate research into practical action.
    - Build professional researcher community.
        - Promote collaborations between researchers, institutions, community groups, NGOs.
        - Develop workforce by creating support and funding for students; build enthusiasm for field through the development of engaging practicums.
        - Improve researcher cultural competency.
    - Build awareness of migrant worker populations in public health research community and general public through the lay and scientific press.
    - Build and strengthen relationships between researchers and community advocacy groups by:
        - Involving advocacy groups in research design and execution.
        - Building capacity in community groups.
        - Sharing research results with community members, in a format and language they can use.
2. Provide recommendations for best models/approaches to achieve adequate sampling of migrant farmworkers, including pros and cons for each proposed method.
    - Establish an ongoing working group on sampling methodologies.
    - Test Respondent-Driven Sampling (RDS) to see if it can achieve adequate sampling in migrant farmworker populations.
3. Recommendations for longitudinal research, both in U.S. and transnational studies:
    - Conduct prospective, longitudinal studies that reach farmworkers in both the U.S. and in "sending" communities, which are essential to understanding this population.
    - Develop relationships and funding for international, prospective, longitudinal studies.
    - Develop effective and innovative tracking strategies.
4. Whether methods need to be modified when conducting research on tobacco use:
    - Consider cultural and spiritual/religious attitudes toward tobacco, smoking patterns (which may be inconsistent among these populations), political context and its effect on mental health, and various subpopulations.
    - Develop standard tobacco use questions to allow comparability between studies.

Background

In 1998, the *Department of Health and Human Services published Tobacco Use Among U.S Racial/Ethnic Groups, A Report of the Surgeon General*.[1] The report forcefully called attention to the need for addressing tobacco-related disparities among racial and ethnic groups. Over the last decade, research on tobacco use among these populations has increased. However, challenges remain in studying some populations. Research on migrant farmworkers presents unique challenges to researchers. This inherently seasonal and mobile population requires special approaches to sampling and follow-up, as well as attention to a variety of social, economic, and cultural determinants of health.

Literature Review

Despite the difficulties involved in studying this inherently seasonal and mobile population, research on the health of migrant worker and farmworker populations has increased over the past decades.[2] Although many gaps in research remain, the existing literature has begun to describe the social, economic, and cultural determinants of migrant farmworker health, as well as health outcomes. A significant determinant of health for the population is tobacco use, yet few studies exist on tobacco use in this understudied and at-risk population.

Demographic Characteristics and Health Profile of Migrant Farmworkers

While there is no authoritative census of migrant workers in the U.S., the population was estimated at 2.5 million in 1990.[1] This population is "migrant" in more than one sense. The National Agricultural Workers Survey (NAWS), a nationwide survey of farmworkers conducted by the U.S. Department of Labor, reports that, in 2001-2002, only 23% of the farmworker population was born in the United States; fully 75% were born in Mexico, while 2% were born in Central America, and 1% were born elsewhere.[3] This immigrant population may or may not remain in the U.S.; many return to their communities of origin after short or longer periods of working in the U.S., or cross borders repeatedly to obtain health care, visit family members, and so on.[4] Fifty-three percent of farmworkers are immigrants in the United States without legal authorization to work, 25% are U.S. citizens, 21% are immigrant permanent residents, and1% are immigrants with some other legal authorization to work in the U.S.[5]

Farmworkers are also considered to be migrant if, independent of country of origin, they travel long distances to seek work. In 2001-2002, 42% of crop workers surveyed by NAWS traveled at least 75 miles during the course of the year to get a job. Of these, 26% traveled only within the U.S., while 35% traveled across national borders.[6]

A variety of social, cultural, and economic conditions impact migrant farmworker's health.[7] Farmworker incomes are low: 30% of this population lives below the federal poverty line, and average family income for 2001-2002 was $15,000-$17,499.[8] Despite low incomes, few farmworkers access federal aid programs.[9] Many also lack primary education, with only 6% of farmworkers born outside the U.S. having completed 12th grade. The majority (81%) speak Spanish as a first language, and about half report inability to speak and read English. [NAWS].[10] Most are not covered by health insurance, unemployment insurance, or workers' compensation.[11]

Conditions at home and work also present health hazards. Housing conditions for this population are often inadequate and overcrowded.[12] At work, farmworkers face risk of traumatic injury, musculoskeletal disorders, acute and chronic disease from chemical exposures, as well as skin and eye problems. Migrant farmworkers also face significant mental health challenges related to working and living conditions as well as the stress of migration and anti-immigrant sentiment and racism.[13] In addition, migrant farmworkers confront serious barriers to accessing health care.[14] A study of farmworkers in 24 states found elevated mortality from injuries, tuberculosis, mental disorders, cerebrovascular and respiratory diseases, ulcers, hypertension, and

cirrhosis; along with reduced mortality from infectious diseases (other than tuberculosis), endocrine disorders, nervous system diseases, pneumoconiosis, arteriosclerotic heart disease, and all cancers combined (despite elevated mortality from some cancers). [15]

Tobacco Use

Very few studies have addressed the topic of tobacco use and health outcomes in this population. A smoking prevalence of 20% was reported for California farmworkers based on 2003-2004 NAWS data.[16] A ten-year study found smoking rates of 28.4% (1990) and 17% (2000) among male migrant farmworkers living in a labor camp in Mendocino County, California.[17] In North Carolina, one study found 38% of studied Mexican tobacco workers to be smokers.[18] A study of Mexican immigrants living in rural North Carolina found 16.8% were current smokers and 17.3% reported smoking in the last month.[19] In Idaho, 29% (42% men; 5.6% women) of migrant farmworkers studied were smokers.[20] Lee et al. reported a 12.5% prevalence of smokeless tobacco use among farmworkers based on NHIS data. [21]

Those studies that included analysis by gender found smoking prevalence to vary greatly between men and women. [22] For example, the Idaho study found a smoking prevalence of 42% among men, but of only 5.6% among women.[23] This pattern has also been found in studies of Hispanic, Mexican immigrant, and Mexican American communities more generally.[24] A few studies have found that smoking prevalence for farmworkers does not differ greatly from prevalence among the broader Hispanic or Mexican American population. [25]

A small number of studies have looked at tobacco use among youth who belong to migrant farmworking families. In a study of adolescents in a rural California community, Casas et al. found daily use of tobacco among 2.6% of Mexican American migrant farmworker 6th grade males and among 9.4% and 3.1% of 12th grade males and females, respectively. Lifetime tobacco use was reported by 15.8% of 6th grade boys, 13.5% of 6th grade girls, 58.5% of 12th grade males, and 57.8 % of 12th grade females. By 12th grade, 22.6% of migrant boys and 1.6 % of migrant girls had tried smokeless tobacco at least once. These researchers found a complex interaction between age and cultural identification as predictors of smoking behavior.[26] Similar rates were reported in another study by these researchers with a comparable population and were not found to significantly differ between migrant and nonmigrant adolescents.[27] Among rural South Texas migrant farmworker youth, Cooper et al. found that migrant youth were more likely to report frequent substance use than their nonmigrant counterparts: 45% of migrant middle school students and 48.4% of migrant high school students had smoked one or more days within the past month; 23.6% and 34.4%, respectively, had used snuff.[28] Among migrant adolescents (11-16 years of age) in San Diego County, California; 2% were current smokers confirmed by CO level measurement while 26% reported smoking at least once in the past. [29]

A key question for researchers has been whether smoking behavior changes with immigration. Some studies have found an association between acculturation measures and smoking status among Hispanic/Latino[30] and Mexican American women.[31] Caraballo et al. found that, of Mexicans living in the United States, those who identify as Mexican American smoke more than those who identify as Mexican.[32] In a study of migrant farmworkers in North Carolina, Spangler et al. found a non-significant positive relationship between English proficiency and number of cigarettes smoked per day.[33] Loury et al., however, found preimmigration use to be the single significant predictor for tobacco use among Mexican immigrants in North Carolina. [34]

Migrant Farmworker Sampling Methodology Meeting Outline

The Migrant Farmworkers Sampling Methodology Meeting was held March 14, 2008, at The California Endowment in Los Angeles. The meeting brought together 27 researchers from a variety of disciplines who are working on various aspects of research on migrant farmworkers. The purpose of the meeting was to:

- Identify obstacles/barriers in achieving adequate sampling of migrant farmworkers in research.
- Summarize effective methodologies to adequately sample migrant farmworkers.
- Generate recommendations for carrying out robust research on migrant farmworkers.
- Address the question of whether methods need to be modified for conducting research on tobacco use in migrant farmworker populations.

Prior to the meeting, participants reviewed a number of articles addressing tobacco use in migrant farmworker population, sampling migrant farmworkers, and sampling strategies for "hard-to-reach" populations in general. Once convened, the first half of the day-long meeting was spent in a series of four presentations and discussions, each addressing a separate aspect of the meeting topic. During the second half of the day, meeting participants split into working groups to develop recommendations for addressing four questions critical to the future of research on tobacco use in migrant farmworker populations. At the end of the day, the full group reconvened to further discuss its final recommendations.

Meeting Review Articles

The planning committee conducted a search of articles that address tobacco use and sampling issues in migrant farmworker populations. To prepare for the Migrant Farmworkers Sampling Methodology Meeting, participants reviewed the following articles to serve as a foundation for the discussion:

- Robert Magnani, Keith Sabin, Tobi Saidel and Douglas Heckathorn. Review of sampling hard-to-reach and hidden populations for HIV surveillance. *AIDS 2005*, 19 (suppl. 2):S67–S72.
- D. Villarejo and S. A. McCurdy. The California Agricultural Workers Health Survey. IN PRESS: TO BE PUBLISHED IN 2008 JOURNAL OF AGRICULTURAL SAFETY AND HEALTH LIMITED DISTRIBUTION THE FARMWORKER SAMPLING WORKGROUP WITH PERMISSION OF AUTHOR.
- Richard Mines, Jackie Hausman, Lisette Tabshouri. The Need for Targeted Surveys of Farmworkers: A Comparison of the California Health Interview Survey (CHIS) and the California Agricultural Worker Health Survey (CAWHS). April 2005. [Report for the California Program on Access to Care.]
- The California Farm Labor Force: Overview and Trends from the National Agricultural Workers Survey (NAWS). June 2005. Burlingame, California: Aguirre International. Available at: www.EPA.gov and at www.ucop.edu/hia.
- Farmworker Identification According to Public Law 104-299.
- Manuel Casas, Alfredo Bimbela, Carla V. Corral et al. Cigarette and Smokeless Tobacco Use among Migrant and Nonmigrant Mexican American Youth. *Hispanic Journal of Behavioral Sciences.*1998; 20: 102-121.
- Sharon P. Cooper, Nancy F. Weller, Erin E. Fox, and Sara R. Cooper. Comparative Description of Migrant Farmworkers versus Other Students Attending Rural South Texas Schools: Substance Use, Work, and Injuries. Journal of Rural Health. 2005; Vol. 21, No. 4.

Meeting Presentations and Discussions

The first half of the meeting was spent in a series of presentations of the state of knowledge on various aspects of sampling in migrant farmworker research.

Presentations included:

1. Demographic characteristics of migrant farmworkers communities, Alice Larson
2. Review of effective models/approaches to sample mobile/migratory or seasonal populations, Don Villarejo
3. Cultural/social/environmental factors in conducting research in migrant farmworker communities, Mark Schenkar
4. State of knowledge on tobacco use in migrant farmworker communities, Susan Gabbard

Each presentation was followed by a full-group discussion, in which participants shared their experiences and perspectives on the topics under discussion.

Recommendation Development

The second half of the meeting was spent in the development of recommendations for sampling migrant farmworker populations. Meeting participants broke into three working groups, with each group developing recommendations in the following areas:

1. Addressing barriers in conducting research on migrant farmworkers.
2. Providing recommendations for best models/approaches to achieve adequate sampling of migrant farmworkers.
3. Conducting longitudinal research, both in U.S. and transnational studies.
4. Whether methods need to be modified when conducting research on tobacco-use.

At the end of the day, the working groups reconvened to discuss final recommendations.

Presentations and Discussions

Presentation One

Who are we talking about when we say 'Migrant Farmworkers'?

Alice C. Larson, Larson Assistance Services, Vashon Island, WA

Attempts to define migrant farmworker communities face several challenges. This population may be categorized according to industry, task, seasonality, and movement.

Categorization by Industry. Defining migrant worker population in terms of industry raises questions about the definition of "agriculture." While the NAICS code 11 includes agriculture, forestry, fishing and hunting, programmatic and research definitions of migrant farm workers may exclude certain workers within this category. Crop agriculture is clearly included in all definitions of agriculture, but this definition can be complicated when considering the nursery or landscape, forestry, livestock, and fishery industries. On the other hand, food processing work is not considered part of the agricultural industry but is closely allied to it; workers in this industry (such as food processing plant workers) may fall within the scope of concern of researchers studying migrant populations.

Categorization by Task. Defining a research population in terms of work tasks complicates categorization by industry. Some workers within the agricultural industry may perform tasks that differentiate them from the broader population of migrant workers, including higher-waged or more highly skilled workers like aerial pesticide sprayers, animal trainers, farm managers, truck drivers, equipment operators, and so on.

Categorization by Seasonality. There are various and sometimes competing definitions of "seasonality." Definitions of "seasonal" farm workers may include:

- Workers with a number of short-term jobs at various farms over the course of the agriculture cycle
- Settled workers who do farm labor for only part of the year, potentially including:
  - Adult populations who work for most of the year in another industry, such as construction
  - Students who may work during summers or school breaks
- Workers who are employed by one grower but work at different sites according to the agricultural cycle
- Employees of farm labor contractors who work at seasonal tasks at several different farms over the course of the year
- Unpaid family members

Seasonality is important in considering issues of underemployment among study populations.

Categorization by Movement. Migrant workers are a subset of seasonal workers. Definitions of migrancy, however, may differ according to research or programmatic criteria. Migrant workers may be considered to include:

- Workers who relocate over the course of a specific time period
- Workers who live more than a certain distance from their place of work (generally ~75 miles)
- Workers who are unable to return to their normal residence at night due to distance of workplace.

Inclusion of Household Members. Studies on migrant farmworkers may or may not include family/household members. Definitions of "household" and "family" present methodological challenges:

- Family or household may be defined according to relationship, shared expenses, financial dependence, and/or proximity
  - May include extended family
  - Multiple solo males boarding together may or may not be considered a "household"
  - Families may be spread over more than one dwelling
- Dwellings may include more than one family or household

Discussion One

A key question for researchers is whether we are looking at comparable populations and by extension, if our findings are comparable.

Task. Defining by task is key to understanding these populations. It is important and relatively easy to exclude some occupations (such as aerial sprayers) from the definition of study populations. In addition, defining by task can provide more information on health risks; we do not assume that manufacturing workers are all doing the same task, and we should not make that assumption when it comes to agricultural workers. Potential resources for definition by task may exist in workers' compensation (WC) "risk codes" in the states where farmworkers are covered by WC. These codes clarify the question of who is doing the work of producing agricultural commodities for sale.

Temporal Aspects. Researchers and programs have "look-back periods" of varying lengths. The "look-back period" is the length of time in which one has to have worked as a farmworker in order to still be considered a farmworker for research or programmatic purposes. Research and programs may have various "look-back periods;" in the case of cross-sectional studies such as NAWS, there is no such period. While long look-back periods do not help understand current working conditions, in the context of employment patterns, where workers may "scallop" in and out of farm work, look-back periods may be an important consideration in research.

Categorization by Mobility. There are several caveats to consider when defining populations based on patterns of movement.

- The definition of migrancy also differs depending on national or international perspectives. Immigrants to the United States may or may not be considered "migrants" if they remained settled once in this country.
- The current economic context means that any job can be "seasonal;" in the urban sectors, this is called "temporary" or "contingent" employment. Workers follow the jobs and rarely have only one job, or a permanent job.
- The category of "migrant" may itself be a nostalgic, romantic concept that is largely irrelevant from a public health perspective; instead, it may be more important to understand the risks of agricultural work per se.
- On the other hand, migrant status may have important health effects due to the disruptions caused by movement, perhaps especially in terms of mental health issues which may have broad implications in terms of substance use.

The question of migrancy may or may not be relevant depending on the research question. Researchers should remain flexible and carefully consider the role of migrancy in their study design.

Inclusion of Household Members. The definition of family members is important both in terms of eligibility for programs and research questions. Family members, including non-child dependents, share the social and material conditions of farmworkers.

Programmatic Definitions. Various programmatic definitions of "migrant farmworkers," meant to specify eligibility for federal, state or other services may be at odds with research goals and definitions.

Some programmatic definitions may help researchers to define farmworker populations for their own research. For example, farmworkers can be considered a special category by virtue of their exclusion from national legislation such as the Fair Labor Standards Act and the National Labor Relations Act, as well as workers' compensation programs in almost all states. One way to define research populations could be to look at which populations are excluded from such legislation.

However, programmatic definitions may also complicate or conflict with research design (or with workers' own economic or political aims, as in the case of North Carolina Christmas tree workers who are seeking non-agricultural status in order to gain access to overtime pay). For example, it may make sense to consider the health risks faced by certain food processing workers (usually considered to be industrial rather than agricultural workers) as part of research on agricultural workers. In another example, dairy workers in Wisconsin are mostly mobile workers originating from Mexico and according to researcher definitions and common sense, would be considered migrant farmworkers, but according to government programs, they are not.

Furthermore, there are myriad definitions of migrant workers used by various federal and state

programs. Although there have been attempts to standardize these definitions across programs, they have been unsuccessful. There is variance not only between programs but also within programs, as various sites may implement broad criteria differently.

Finally, government definitions of migrant farmworkers are based in a history of exclusion of this population from a range of rights, services, and benefits. It can be problematic for researchers to base criteria for population definition on this precedent.

Although adoption of federal and/or state definitions is not the best option, it would still be useful for researchers to have some basis for a common definition of this population to foster comparability of results.

Emergent Themes

- The development of uniform definitions, questions, and research instruments could save labor and allow for easier comparisons across research.
- Different research questions may require a different definition of migrant farmworkers.
- A discussion of various research definitions is complicated by the existence of definitions utilized by federal and state programs.
- It would be useful for researchers to have a tool, such as a checklist or matrix, that would indicate characteristics of populations under study using standardized definitions.
    - Terms from the matrix or checklist could be published with study results.
    - This tool would allow for comparability while maintaining researcher flexibility in study design.
    - Large-scale surveys, such as NAWS, could include questions meant to classify respondents by the various definitions of the checklist or matrix.
    - One drawback of this plan is that it could allow for the exclusion/invisibility of fringe populations.
- Research is needed to help understand how migrant farmworkers define themselves.

Presentation Two

Effective Models to Sample Migratory Farm Labor Populations: A Review

Don Villarejo, California Institute for Rural Studies, Davis, CA

Employment-based and household-based sampling models have successfully been used to study farm worker populations. Each of these models presents various opportunities and challenges to researchers.

Employment-based samples

- California Farm Labor Force Study (April 1969). Participating employers identified workers as potential research subjects; researchers selected a random sample of 3,488 workers stratified by earnings. Migratory workers were defined as those who worked in more than one agricultural area of California, or in an area distant from their regular residence. Migrant workers were undersampled in the study; only 36% of migratory workers were interviewed, compared to 63% of non-migratory workers.
- Napa and Mendocino Counties Study (2006). Used farm labor housing combined and cluster sampling of employers (farm owners and labor contractors) to identify employers. Conducted interviews with random samples of employers and workers to assess demand for housing.
- National Agricultural Workers Survey (NAWS). Used multi-stage stratified sampling of crop workers to assess number of workers in perishable crop agriculture. Used three 10-12 week cycles of interviews (February, June, October) at various levels, with samples proportional to size of labor force (crop region level) and labor expenditures (farm labor areas and counties), as well as simple random samples (of employers per county and workers per employer).

Drawbacks to employer-based sampling include difficulties in compiling lists of employers, farms and/or labor contractors due to expense and operator turnover. It is generally difficult to contact employers, and very little is known about the differences between cooperating and non-cooperating employers. In addition, workers who are injured or ill during surveys are excluded; interviewing workers at residences and performing physical examinations may be difficult because residences may be widely dispersed.

Household-based samples

Household-based sampling utilizing careful mapping of migrant worker dwellings has proven to be a model methodology for a community-based, cross-sectional survey that includes a physical examination. It involves advance mapping of all identifiable sleeping quarters presumed to be occupied by migrant workers during peak season; dwellings are randomly sampled when workers are present.

- Early examples include a Colorado Migrant Council study with support from Milbank Memorial Fund and Parlier, California study carried out in the early 1990s.
- Agricultural Workers Health Survey (CAWHS). Researchers mapped dwellings in seven sample communities and took a random sample of dwellings, and a simple random sample of eligible workers living in each dwelling (except women who were oversampled to ensure adequate representation).

Issues with household-based samples include the expense of verifying dwelling locations. Results are good where workers are concentrated but difficult or impossible when workers are dispersed in cities. It may be difficult to determine the true number of inhabitants per dwelling; however, sick or injured workers are included. Although there is greater response among year-round workers, migratory workers are probably underrepresented. Benefits include high response rates and the ability to carry out comprehensive physical exams with efficiency and reasonable expense.

Discussion Two

Household-based Sampling. In locations where a majority of agricultural workers live in camps, such as North Carolina, household sampling is complicated. For example, camps with populations even as high as 2,650 may be difficult to find and transitory. Both people and the camps themselves may disappear. For example, blueberry workers stay in camps for a harvest period of only two weeks. In general, researchers must assume a 30% loss of sample due to crop cycle, out-migration, and health issues. However, participation rates can be very high once access is attained. Building reciprocal relationships with community partners and known service providers and advocates is essential to conducting research in camps, as it is very difficult to find camps, gain access, and win trust without significant within-community partnerships.

Targeted Sampling. Targeted sampling uses an initial ethnographic mapping of a study population to identify particular subgroups from which to sample. Magnani et al. have argued that the ethnographic mapping is too expensive and time consuming to be practical, but some researchers have had success using variants of this model to sample migrant farmworker populations. For example, a version of targeted sampling can be used to improve the universe of employers, households, venues. Farmworkers approached at neutral venues may be willing to give information on employers that is otherwise unavailable, including "fly-by-night" employers. In addition, workers' knowledge of hidden housing may be used to improve listings of households in community mapping projects. Partnerships with community-based organizations can be essential in carrying out targeted sampling.

In a North Carolina study of poultry workers, lack of access to employers led researchers to adopt an ethnographic approach to determine where workers lived (generally speaking). Mapping found that 2/3 of workers lived in an identified neighborhood, and 1/3 lived in dispersed agricultural dwellings. Sampling was then done in neighborhoods according to size of neighborhood and estimated number of poultry worker residents; dispersed agricultural dwellings were randomly sampled.

Respondent-Driven Sampling. Respondent-Driven Sampling (RDS) and similar methods (such as link-trace and random walk-through sampling) are based on a snowball sampling-type strategy, but various structures imposed on the snowballing method allow selection probabilities to be calculated. These sampling methods have proven useful in reaching many "hard-to-reach" populations, such as injection drug users, sex workers, etc. In addition, they help researchers develop a good sense of social networks of populations under study.

In RDS, "seed" participants are given coupons with unique identifiers to pass on to a limited number of eligible peers; if peers enroll in the study, seeds may receive a payment. Each round of recruits is given another set of coupons until sample "equilibrium" is achieved (i.e., the sample exhibits stable population indicators). Selection probabilities can be calculated because relationships between seeds and recruits can be traced through the coupons and because each respondent is asked to estimate his/her number of recruitable peers.

One study of indigenous Mexicans working in California agriculture conducted by Rick Mines used RDS to build on earlier ethnographic work. Within six weeks, the method had successfully reached 400 participants. A study from Mexico used RDS to find migrants at home during December and January, reaching 1300 workers across five states in Central Mexico over this two-month period.

Despite these successes, RDS may not work in all communities. This method is designed to work in stable communities, which raises questions about its use in highly mobile migrant communities, such as in North Carolina. Some communities might not function in accordance with the assumptions on which RDS is based. For example, in farmworker communities, respondents may not be able to accurately estimate the size of social networks. Because respondents' estimates of social network size are used to calculate sampling probability, lack of reliable estimates may undermine the use of RDS.

It is essential to have a good biostatician on the research team to adequately use the RDS method.

Affect of Mobility on Sampling Strategies. It is self-evident that the mobility of migrant populations complicates research. Researchers, often working in partnership with migrant communities, are developing interesting insight into mobile populations and tools for studying them.

The agricultural cycle determines in large measure when migrant workers are present in a particular location. Researchers may choose a cross-sectional study during peak season or take repeated measures over the duration of the growing season. One group of researchers found that sampling in November allowed them to reach a very vulnerable segment of the population.

Voluntary or forced return to country of origin may mean that migrant workers in individual studies are lost to follow up, and that, more broadly, the long term health consequences of migrant work are hidden as workers return home when they are old or ill. However, innovative research such as Rick Mines' Binational Health Survey has followed workers across national borders. Working with community members as co-researchers can also provide important tools for transnational research. Many indigenous villages in Mexico, for example, maintain excellent records of emigrants and organize social support networks in the U.S.

Innovative researchers may be able to obtain data on mobile populations from a variety of sources, including consulates, telephone records (this was done in Mexico but may be harder in the current political context in the U.S.), or money transfer companies such as Western Union.

Working with Community Partners. The current political climate places hardship on migrants that, in turn, affect research. At times of great anti-immigrant sentiment, people will try to remain hidden. At the same time, there is little research being conducted on the health outcomes and needs of this population, and journals and funders may exhibit little interest. This unfortunate state of affairs should encourage rather than discourage research. Researchers must strive to develop innovative research plans and above all, to build alliances with the communities we study.

Regardless of sampling methodology, researchers are most effective when they work in reciprocal partnerships with community members. Migrant workers have often been referred to as a "hard to reach" population; the use of this term, however, mostly reflects researchers' own limitations. Reaching migrant populations requires establishing relationships and building trust well before the beginning of a research project. Researchers should ask community members, "What can we do to help?" and follow through on commitments. Working with community members in planning and implementing research and disseminating results will allow researchers to be more successful in carrying out relevant and useful research.

Emergent Themes

- Researchers' selection of sampling methodology should depend on the research question and population under study.
- Employer-based, housing-based, targeted, or respondent-driven sampling techniques may each be appropriate in different contexts.
- The mobility of migrant workers presents challenges that can and have been addressed by innovative researchers, and studying this diverse population requires creative solutions.
- It is absolutely essential to work with migrant farmworker communities in meaningful ways.

Presentation Three

Cultural, social, and environmental factors in conducting research in migrant farmworker communities

Mark Schenkar, University of California Davis, Davis, CA

Researching migrant populations requires special efforts to locate and recruit participants, achieve random representative samples for research, and address population-specific cultural, social, and environmental factors.

It is difficult but important to devise random, representative samples for research. Farmworkers may be hard to identify and locate, and no existing list or sampling frames exist. Nonrandom sampling methods are problematic because of lack of generalizability and limited ability to use probability statistical methods. The MICASA study achieved a representative sample by enumerating all farmworker dwellings and residents within its randomly-selected geographical scope, and comparing characteristics of a random sample to the full enumerated population. MICASA looks at occupational and environmental risks, health status, and behavior changes over time in this population.

Cultural, social and environmental factors should be contemplated in recruitment and sampling. Researchers must consider cultural factors such as language, years in the U.S., birth country, and acculturation status, as well as social factors like education and literacy levels, gender, income, and fears and sensitivities related to anti-immigrant political climate. Also important are environmental factors including mobility of workers, their housing situations, and their often complex occupational histories. These factors may function as barriers between researchers and participants and also will vary within migrant farmworker populations. Looking at such factors, MICASA found, for example, gender differences in education, years in the U.S., and acculturation status.

A community-based approach builds support and rapport with hired migrant farmworkers and other community members. MICASA's local field team of interviewers are former farmworkers or from farmworker families. In addition, the project gets advice and feedback from a community advisory board, and involves the community through collaborations and public activities.

Discussion Three

There was broad agreement among the group on the importance of working with the community. The discussion focused, however, on a controversial topic: the concept of acculturation among immigrant populations. In addition, participants addressed the varied impacts of employers' attitudes on research.

Acculturation. A lively discussion on acculturation pointed out some of the problems and nuances associated with the concept. Many members of the group disliked the use of the term acculturation. The process it connotes is a complex and dynamic one that is confounded by SES and environmental factors. It may even be rendered meaningless by the globalization of consumer and media cultures and the enduringly transnational lives of migrants.

Acculturation patterns are not stable, and not only differ between ethnic groups but within them. For example, Korean immigrants may see health outcomes improve with acculturation while Latino immigrants show a decline. In this case, the political and social climate faced by immigrants must be taken into consideration. We need to study various groups of immigrants, including Jamaicans, Haitians, Russians, and various Asian groups, in order to better understand the concept of acculturation.

Acculturation becomes a particularly problematic concept in the context of globalization or transnationalism. Media and products increasingly cross borders, meaning that there is already a great deal of homogenization and/or cultural sharing across nations/populations prior to emigration. In addition, it may be helpful to conceptualize migrants' lives as transnational lives. Unlike the traditional/historical model, we can no longer argue that there is a unidirectional acculturation. Families and com-

munities in sending countries still have an active role in immigrants' lives, and there is active transnational exchange through the internet, radio, travel, money transfer and so on. A project on Brazilian migrant workers shows, for example, the use of internet radio for multidirectional information exchange. This project suggests that as the nature of work becomes more stable and contingent, workers have had to change their strategies as well.

It is also important to consider what aspects of U.S. culture immigrants will be exposed to. An anti-immigrant political and social climate may influence the acculturation processes, creating bad outcomes as people receive negative messages about their presence in the country to which they have immigrated. Some other aspects of culture that may be important to consider are patterns of civic engagement (that may be shaped by legal and political climate, including visa rules); impact on behavioral health and self esteem because of criminalization of immigrants; cultural concepts of risk, body, and health; lack of social cultural supports; and the potential to build elements within community to promote health.

When speaking of acculturation, we should remember that culture is not a thing, but a system of shared beliefs. Culture is not monolithic, even within narrowly-defined groups, and it changes in different ways over time. Material culture may change easily, but other aspects of culture may be more basic and important, including family connections and health beliefs.

Because the concept of acculturation is complicated, findings related to measures of acculturation are often hard to address. For example, what aspects of acculturation account for the finding from the MICASA study reported by Schenkar, that time in the U.S. is the single strongest predictor of cigarette smoking among the women studied? Further research is needed to take a closer look. Measures may be flawed; for example, using a language measure as part of acculturation measures is problematic in a place like California, where Spanish speakers may not need to acquire English language skills even after 20 years in the U.S. Like SES, acculturation may be highly associated with numerous health outcomes, but we really need to understand what is going on rather than just control for it in our analyses. In considering acculturation and cultural influences on health behavior, we have to tease out the specific indicators and outcomes.

Political Constraints on Research: Role of Agribusiness. The role of agribusiness, growers' organizations, and employers in general is an issue that can affect the ability of researchers to carry out effective studies.

Workshop participants' experience working with growers is mixed. Research on some topics germane to migrant farmworkers (i.e., pesticides, tobacco) are controversial and politically charged. In cases such as these, growers are unlikely to want to cooperate with researchers. However, some researchers have had good experiences working with growers' organizations. It may be better to make contact with growers' organizations before findings are released, as news coverage may create resentment among growers and endanger further research.

It is important to consider each case individually, keeping in mind that there is great variability both within and between firms/growers. Agribusiness is often organized vertically, and upper level management may have very little idea about what goes on in the field. This varies by case, however. In one Michigan study, farmers knew a lot about worker conditions while in central Washington, large growers had very little information about their workers.

The California Endowment has found that having all players involved is key to project success. Relationships of familiarity and trust have been built to the point that California Rural Legal Assistance can observe violations in the field and gets them fixed by talking with management.

Emergent Themes

- Working with community members in meaningful, mutually-beneficial ways is essential to carrying out research on migrant farmworker populations.
- Building partnerships with growers' organizations can also assist in research, depending on the particular context of research and the questions under study.
- Researchers must pay attention to the particular social and cultural dynamics of the population under study and look for specific health indicators and outcomes related to those dynamics.

Presentation Four

An Introduction to Farmworker Tobacco Use

Susan Gabbard, JBS International, Burlingame, CA

Very little is published on tobacco use among migrant farmworker populations, and what is published is hard to find. There is existing data that could be analyzed, but little funding exists for this analysis, and the data "ages" quickly as migrant populations rapidly change.

Issues that emerge as central to the small number of existing studies include ethnicity, country of origin, acculturation, risk factors, secondhand exposure in children, prenatal exposure, and occupational exposure to nicotine through contact with green tobacco. There are a few surveys relevant to the topic of migrant worker tobacco use. However, for two of these surveys, NAWS and CAWHS, analysis on smoking data have not been published. In surveys of California Migrant Housing Residents, North Carolina male tobacco workers in housing camps, and Texas farmworker high school students, smoking was only a secondary focus. Comparing these studies can be difficult, as populations, study designs, tobacco-use questions, data collection methods, and reporting differ between studies. Some cautious comparisons show varying "current smoker" and "ever smoked" rates. Studies that report age at uptake show it to be in the late teens, and most show cigarette-per-day figures in the single digits. NAWS data show the highest smoking rates among "FTC" and "shuttle" migrant workers, slightly lower rates among settled migrant workers, and the lowest smoking rates among recent immigrant migrant workers.

Discussion Four

A brief discussion followed the presentation, adding a variety of observations.

- Farmworkers can be understood as a light and intermittent smoking population.
- Smoking rates may go up or down with immigration, there may be a regression to the mean.
- It is important to pay attention to gender; Mark Schenker has found the number of years in the U.S. to be the first predictor of use among women.
- Researchers should look at the tobacco industry's history of promoting products to migrant workers.
- Much of the NAWS data has not been analyzed; academics should consider applying for NIH R03 grants to perform secondary analysis.
- The Framework Convention on Tobacco Control may offer possibilities for transnational studies that could help us understand changes in smoking patterns with international migration.
- Standard measure of tobacco use should be used in studies with migrant farmworkers in order to compare across studies and aggregate study data when possible.

Recommendations

1. Addressing barriers to research on migrant worker populations

- Develop standard questions to further encourage comparability between studies.
- Develop a tool (such as a matrix or checklist) to help ensure comparability of research for:
  - Definition of population
  - Tasks
  - Look-back periods
  - Time in U.S.
  - Definition of migrancy
  - Mobility
  - Demographic characteristics
  - Tobacco use behavior
  - Other key factors
- Build funding stream for research on this population.
  - Identify new and nontraditional sources of funding (including federal funding, private foundations, and service providers).
  - Educate funders on the importance and feasibility of this work.
  - Partner with government and advocacy groups to fund and collaborate on projects that translate research into practical action.
- Build professional researcher community.
  - Promote collaborations between researchers, institutions, community groups, NGOs.
  - Develop workforce by creating support and funding for students; build enthusiasm for field through the development of engaging practicums.
  - Improve researcher cultural competency.
- Build awareness of migrant worker populations in the public health research community and general public through the lay and scientific press.
- Build and strengthen relationships between researchers and community advocacy groups by:
  - Involving advocacy groups in research design and execution.
  - Building capacity in community groups.
  - Sharing research results with community members, in a format and language they can use.

2. Provide recommendations for best models/approaches to achieve adequate sampling of migrant farmworkers, including pros and cons for each proposed method.

- Establish an ongoing working group on sampling methodologies.
- Test Respondent-Driven Sampling (RDS) to see if it can achieve adequate sampling in migrant farmworker populations.

3. Recommendations for longitudinal research, both in U.S. and transnational studies

- Conduct prospective, longitudinal studies that reach farmworkers in both the U.S. and in "sending" communities, which are essential to understanding this population.
- Develop relationships and funding for international, prospective, longitudinal studies.
- Develop effective and innovative tracking strategies.

4. Whether methods need to be modified when conducting research on tobacco use:

- Consider cultural and spiritual/religious attitudes toward tobacco, smoking patterns (which may be inconsistent among these populations), political context and its effect on mental health, and various subpopulations.
- Develop standard tobacco-use questions to allow comparability between studies.

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Appendix A: Meeting Participants

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