

**LAKE APOPKA
FARMWORKERS
ENVIRONMENTAL
HEALTH PROJECT**
*Report on Community
Health Survey*
May 2006

With deep gratitude for and acknowledgement of their tremendous contribution to Florida's vegetable crop production, the Farmworker Association of Florida would like to dedicate the Lake Apopka Farmworkers Environmental Health Project's *Report on Community Health Survey* to the former Lake Apopka farmworkers. This report is a compilation of the data analysis of 148 environmental health surveys conducted with the former Lake Apopka farmworker community from January – December 2005. We would like to thank all of the survey participants, community members who were trained as interviewers, Farmworker Association staff, and volunteers who contributed to this project.

The survey design, implementation, analysis, and report were made possible through funding from the *Presbyterian Committee on the Self-Development of People* and the *United States Environmental Protection Agency*.

Ron Habin, Ph.D.
Principal Investigator

Geraldean Matthew
Project Coordinator
Farmworker Association of Florida

"Farm worker families bear many burdens to make a living in agriculture. Past and present pesticide exposure leaves a toxic legacy that denies them a safe and healthy environment. This survey is another bleak reminder of the failure to meet even their most basic health needs."

- Marion Moses, Ph.D., author of Designer Poisons



The Farmworker Association of Florida
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**LAKE APOPKA FARMWORKERS
ENVIRONMENTAL HEALTH PROJECT**
*Summary of Community
Health Survey*
May 2006

The *Lake Apopka Farmworkers Environmental Health Project* was developed in response to the health concerns expressed by the community of former Lake Apopka farmworkers in the aftermath of the closing of the vegetable farms on the north shore of the lake in 1998. Their concerns emanated from two sources:

1) The high rates of illness, disease, and recurring health problems experienced first-hand by individuals and/or observed by the community in their friends, family, and former co-workers who were and continue to be suffering from a variety of ailments; and 2) The unprecedented bird mortality on Lake Apopka in the winter of 1998-1999, which eventually linked the tragic bird deaths to organochlorine pesticides found on the farm fields – the same chemicals to which the former farmworkers themselves had been exposed during the length of their working careers.

Lake Apopka, as Florida's most polluted large lake, rose to international attention in the 1990's because of wildlife studies on the lake's alligator population that discovered drastically reduced reproductive rates, along with genetic deformities, among the lake's alligators. Fifty years of farming on the north shore of Lake Apopka resulted in pesticide and fertilizer run-off that were blamed for the lake's distinctive pea green color. Yet, the more insidious problem would remain invisible. A spill of DDT, in 1980 into a percolation pond at what is now the Tower Chemical Superfund site at Gourd Neck Springs in the south quadrant of the lake, is likely responsible for the breakdown components, DDD and DDE, that were discovered in tissue samples from the studied alligators. Other pesticides that were once commonly used on the farms of Lake Apopka, such as toxaphene, have since been banned, yet, residues and breakdown products remain, and their cumulative and synergistic properties – either on wildlife or on people - have never been seriously studied.

Efforts over the years to encourage local, state and federal agencies to undertake a health assessment and/or study of the Lake Apopka farmworker community met with no response or action, yet, the community continued to recount stories of debilitating illnesses and even death among their members. While research into the impacts on wildlife on Lake Apopka were on-going, human health problems, especially that of former Lake Apopka farmworkers, were summarily ignored. Hence, in 2005, the staff of the Farmworker Association of Florida (FWAF), under the direction of local community leaders and Dr. Ron Habin, an independent anthropologist, designed and implemented a health survey in which 148 former Lake Apopka farmworkers were interviewed to assess their health problems, and their exposure to pesticides and other environmental contaminants. Through the work of this project and the release of this report, it is hoped that some of the people's concerns may at last be heard and addressed. Ideally, this project will generate increased interest in the community's concerns leading to constructive actions that will improve the health of individuals and the community as a whole.

Survey participants.

GENDER		AGE							RACE/ETHNICITY						
M	F	0-19	20-29	30-39	40-49	50-59	60-69	70+	African Amer.	Mex-ican	Mex.-Amer.	Puerto Rican	Other Hisp.	Haitian	Cau-casian
32%	68%	0%	2%	15%	27%	19%	20%	17%	78%	13%	1%	3%	2%	2%	1%

Respondents' length of time worked on farms.

0-5 yrs.	6-10 yrs.	11-15 yrs.	16-20 yrs.	21-25 yrs.	26+ yrs.
37%	19%	11%	14%	8%	11%

Farm work. The farmworkers surveyed worked primarily in the vegetable crop industry. The major crops grown on Lake Apopka farmlands were: carrots, radishes, corn, cabbage, different types of lettuce, parsley, cilantro, collards, potatoes, beans, bell peppers, cauliflower, celery, broccoli, cucumbers, peas, tomatoes, and beets. The workers performed various jobs on the Lake Apopka farms, including: plowing, hoeing, planting, harvesting, loading, box-making, washing, grading, sorting, branding/bagging, canning, transporting, and applying pesticides and fertilizer.

Pesticide exposure. Ninety-two percent (92%) of the participants surveyed indicated that they were exposed to pesticides in the workplace through such routes as: spray from an airplane, pesticide drift, touching plants with pesticide residues, and inhaling pesticides, among others.

Methods of pesticide exposure.

Touched plants wet from pesticides/dew/rain	87%	Unpacking plants or cuttings	68%
Sprayed by airplane/drift from spray	80%	Washing/cleaning plants/trees/crops	66%
Through hands, skin lacerations	76%	By not washing hands	64%
Entered a sprayed area without notification	74%	When planting, potting, or replanting	60%
Smelling, breathing in, poor ventilation	68%	Pesticide drift into homes, neighborhoods	36%

In addition to prior pesticide exposure on the farms, some community members continue to be exposed to environmental toxins through their consumption of different types of potentially contaminated fish/wildlife in and around Lake Apopka.

Respondents' consumption of fish/wildlife.

	Fish	Wild Vegetables	Turtles	Rabbits	Raccoons	Alligators
Current Consumption (May 1998 to present)	47%	25%	22%	20%	11%	9%
Previous Consumption (prior to May 1998)	68%	47%	33%	29%	16%	12%

Other exposures. Not only were the respondents exposed in the past to agricultural chemicals in their workplaces, but they continue to be at high risk of exposure to a variety of contaminants through various exposure routes due to the multiple neighboring polluting industries and hazardous sites located in the surrounding community. These sources of continuing exposure to pervasive toxins in their environment include: potential pesticide drift from several nurseries located adjacent to residential areas; volatile organic compounds from nearby fiberglass and plastics manufacturing companies and other industries located within the community; two local industrial landfills; two Superfund sites on Lake Apopka; two city sewage treatment plants; and a Stericycle medical waste incinerator.

State of health. When asked to characterize the current state of their health, **83% of respondents stated that they were in either "fair" or "poor" health.** Eighty-five percent (85%) feel their exposure to pesticides has affected their health, and 79% feel their exposure to pesticides is directly related to their current health problems. The following table illustrates the health problems identified by 30% or more of the respondents.

Health problems of Lake Apopka farmworkers.

Arthritis	70%	Nervousness	42%
Frequent sinus problems	60%	A lot of coughing	40%
Throat problems	58%	Earaches/ear infections	39%
Allergies	53%	Asthma	38%
Rheumatism	49%	Sadness a lot	38%
Urinary urgency at night	49%	Uncontrollable anger	37%
Diabetes	47%	Loss of memory	36%
Skin problems/recurrent rashes	46%	Acid reflux	33%
Overweight	46%	Urinary tract/bladder infections	31%
Bladder urgency	45%	Constipation	30%

In addition, there have been concerns about the apparently high number of community members diagnosed with Lupus, a serious auto-immune disease. The results of the survey indicated that 11% of the respondents live in homes where one or more persons have Lupus.

The former Lake Apopka farmworkers surveyed have multiple barriers that hinder them from proper treatment of health problems, such as limited financial resources, lack of adequate transportation, cultural inhibitions, and/or language difficulties. The survey revealed a clear discrepancy between the percentage of people reporting an illness or disease, and those actually treating their health problem with some form of prescription medication, as illustrated in the following table.

Health problems treated with prescription medications.

Symptom/illness	Respondents suffering from this ailment	Respondents taking prescription for ailment
Arthritis	70%	54%
Throat problems	58%	for chronic cough
Coughing	40%	
Allergies	53%	34%
Rheumatism	49%	37%
Diabetes	47%	32%
Skin problems/rashes	46%	30%
Thyroid	18%	14%
Lupus	11%	>1%

In addition, more than 56% of respondents reported that they *regularly* take some form of over-the-counter cough medicines (syrup or cough drops), and more than 49% of respondents reported that they *regularly* use over-the-counter creams to treat skin rashes.

Reproductive health. Of those surveyed, 13% indicated that they had a child born with a birth defect, 21% had one or more problem pregnancies, 14% had complicated pregnancies, 16% had miscarriages, and 8% had reproductive problems.

Multigenerational health problems. A great concern to the farmworker community is whether their exposure to workplace chemicals has produced multi-generational health effects, in particular effects on the cognitive abilities of their children. Of those respondents who have children, 26% have a child/children with a learning disability. Of those who have grandchildren, 37% have a grandchild/grandchildren with a learning disability. Organochlorine pesticides, such as those implicated in the bird deaths on Lake Apopka, are generally considered to be endocrine-disrupting chemicals, similar to those that have had impacts on the offspring of wildlife that have been exposed to these contaminants in the wild and/or in research studies.

Deaths. One area of information missing from this project is the number of former Lake Apopka farmworkers who have died, prior to, during, or after the closing of the farms, their ages at the time of death, and the cause of death on record. This is significant information that warrants further investigation. Any future health study of former Lake Apopka farmworkers should include analysis of the records of the deceased.

Conclusion. The results of this community health survey raise many questions: How many community members may be suffering from diseases that have gone undiagnosed? Which illnesses can be linked to pesticide exposures or immune system suppression due to exposures over long periods of time? What part do organochlorine pesticides play in the health problems of this community? Have endocrine-disrupting chemicals had an impact on the second or third generations of farmworker families? What cumulative and synergistic impacts have exposure to the various agricultural chemicals had on the community's overall health? What health hazards have these farmworkers endured to enable us to have an affordable and reliable food supply?

These are just some of the questions raised by this report. One conclusion that we can draw is that more study needs to be done. Fifty years of providing food for the people of this country should be

repaid by focusing attention on the health needs of this hard-working group of people. We recognize that there is no easy solution to the complex health problems experienced by the former Lake Apopka farmworkers. However, our collective hope is that, through the release of this document, enough effort and resolve will be generated to undertake significant and positive next steps to assist the community in their quest for answers regarding their health. With that in mind, we submit the following recommendations.

PROPOSED ACTIONS NEEDED TO ADDRESS THE IDENTIFIED PROBLEMS IN THE LAKE APOPKA FARMWORKER COMMUNITY

Though the causes and sources of people's illnesses are of significant importance in the long term, the most pressing and immediate issue of concern for the former Lake Apopka farmworker community is their current state of health. In the eight years since the closing of the farms on Lake Apopka and the devastating bird death incident that followed, there have been no actions, interventions, or other efforts on the part of state and/or local government to address in any comprehensive way the community's actual and/or perceived health problems. Aside from a recommendation in 1999 that individuals refrain from eating large quantities of Brown Bull-head Catfish from Lake Apopka, there has been no outreach to this population to even determine the nature and extent of illness and disease that they are experiencing. The following is a list of actions and/or steps, arising out of the results of this work, that are herein proposed to be undertaken by appropriate agencies in order to remedy the years of neglect that this community has experienced.

Actions to Address the Health Needs of the Lake Apopka Farmworker Community

- Improve the accessibility of the community to local health care clinics and local health department facilities including:
 - shorter waiting times for appointments
 - financial assistance for those unable to pay even minimum fees
 - increased availability of specialists to address people's specific health needs, such as, dermatologists, rheumatologists, endocrinologists, and auto-immune specialists
 - reliable and consistent sources and resources for obtaining critical prescription medications (blood pressure and diabetes medications, for example)
 - improved diagnosis of diseases, including requiring a questionnaire about work history within the medical history requirements
 - access to timely testing to improve disease diagnoses and health care treatment
 - availability of transportation alternatives for those with serious mobility issues

Develop and conduct a comprehensive community health study of the former Lake Apopka farmworkers to look at both the health of adults and the incidence of health problems in their offspring, and to test participants for body burden levels of toxicity. Any such study should include input from the community and have two clear objectives

- to determine the extent and nature of chronic and acute illness and disease present within and among this community,
 - to explore the relationship between exposure to environmental toxins and the community's health, both individually and intergenerationally.
- Conduct more targeted testing and monitoring of soil, well water, groundwater, and air pollutants in South Apopka, and in the surrounding communities, especially those adjacent to Lake Apopka. Report these results to the community. Clean up areas of contamination.
 - Develop an educational and outreach campaign specifically designed for this community to:
 - meet as frequently as necessary with concerned community members to respond to their questions and health concerns, and work together to resolve problems
 - to inform them of their health care options
 - to discuss preventative and treatment measures, and to open frank and honest dialogue between health care providers and community residents

- o improve communication at all levels with the goal of improving health care outcomes

PROPOSED CHANGES NEEDED TO ADDRESS THE GENERAL HEALTH OF FARMWORKERS

Based on the survey data collected, anecdotal stories of health problems, and more than 20 years of experience working with various farmworker communities, we make the following recommendations to improve overall farmworker health:

Health Education/Training

- Ensure better training for health care providers in agricultural areas on the detection, treatment, and reporting of pesticide exposure and pesticide-related illnesses.
- Allocate more government dollars to grants to community-based organizations to conduct health outreach and pesticide trainings with farmworkers.
- Improve employer-provided training, in appropriate languages, about pesticide safety for farmworkers and pesticide applicators. Trainings should be conducted by independent persons or groups where possible, to prevent conflict of interest.

Health and Agricultural Practices Research

- Fund more scientific health studies of farmworker populations, focusing on the cumulative and synergistic effects of pesticide exposure, as well as the physical and cognitive multigenerational effects of chronic pesticide exposure.
- Strengthen farmworker housing regulations, and implement more stringent requirements when housing is on the site of or neighboring farms/fields.
- Increase research into sustainable agriculture practices.

Increased Enforcement of Farmworker Protections

- Increase enforcement of the laws protecting farmworkers, through the hiring of a sufficient number of state agricultural inspectors, in order to adequately monitor facilities throughout the state, and to impose greater penalties for violations of those protections when they occur.
- Allocate more government dollars for enforcement of farmworker health and safety protections.
- Conduct farm inspections without giving prior notice to farm operators.
- Impose greater restrictions on the water, air, and soil pollution caused by farming.
- Enforce implementation of the WPS provision that information about workplace chemicals be provided to farmworkers, in the appropriate language and in a format that they can take to their health care provider.
- Improve re-entry interval signage appropriate for illiterate workers.

Other

- Conduct independent evaluation of pesticides' effects on the environment and human health, prior to their authorized use.
- Implement a tax on agricultural pesticide manufacturers and consumers to be used for training, research, and enforcement to protect farmworkers.
- Revise zoning laws so that residential areas are not so close to polluting industries and environmentally-contaminated sites.

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Background. In 1998, the state of Florida closed approximately 15,000 acres of farmland on Lake Apopka that it had purchased for restoration purposes, since decades of chemical runoff had made Lake Apopka the *most contaminated large lake* in Florida. In 1996, when the Lake Apopka Restoration Act was passed, the Farmworker Association of Florida (FWAF) began working with Lake Apopka farmworkers and local agencies to anticipate the needs of the community regarding the impending layoffs of more than 2,500 workers. Initially after the closing of the farms, FWAF's work with this population focused mainly on retraining, re-employment, and relocation assistance. However, in the winter of 1998-1999, approximately 1,000 fish-eating birds were found dead on Lake Apopka, following unseasonal flooding of the farms. After intensive investigation, in June 2001, the U.S. Fish and Wildlife Service issued a report that concluded that elevated levels of *organochlorine pesticides* were responsible for the bird deaths. These are the *same chemicals* that farmworkers were exposed to for more than 50 years while working on the vegetable farms. More than \$100 million government dollars were spent buying out the farms, with additional taxpayer money spent on investigating the bird deaths. However, none has been spent on researching the effects of organochlorine and other pesticides on the health of the Lake Apopka farmworkers. Numerous studies have also documented reproductive abnormalities and immune suppression in Lake Apopka alligators, fish, and turtles. Though extensive research has been done on Lake Apopka wildlife, nothing has been done to assess the health of thousands of farmworkers who lived and worked on and/or around the fields for decades. The *Lake Apopka Farmworkers Environmental Health Project* was created to address workers' growing and on-going health concerns.

**For a more detailed background on the Lake Apopka farm buyout, cleanup efforts, the South Apopka community, and the health of farmworkers and wildlife in the area, please see Appendix A.

About the survey. The survey instrument that was used to document the community health problems (see Appendix B) was created with the input of community leaders (former Lake Apopka farmworkers), staff of the Farmworker Association of Florida, and an independent anthropologist, Dr. Ron Habin, who served as the Principal Investigator for the project. The survey was pilot-tested and subsequently, during multiple community meetings, project leadership made recommendations for revising some of the questions and vocabulary, and adding

other items to the survey. Project staff also conducted two oral readings with community leaders, who made suggestions for making the questions more understandable and culturally appropriate. In addition, the survey was reviewed by a special education reading teacher, who recommended specific vocabulary changes to accommodate appropriate reading and comprehension levels. The survey was also reviewed by two physicians (one English-speaking and one bilingual, Spanish/English) to assure proper wording of questions and grouping of symptoms. In total, the survey went through eight full revisions to incorporate the comments and suggestions that were made, and to format the survey.

The actual survey design was finalized in early February 2005. Between January and March, a total of five training sessions were held, during which eight community leaders were trained on interviewing techniques and on how to conduct the survey. The total number of surveys completed by the end of the project was 148. Survey participants were each given a \$10 gift card in exchange for their participation. The process of interviewing participants took at least one hour per survey. Two persons conducted the interview together – one person completed the actual interview, asking the questions and writing down the responses, while the other person operated a tape recorder to ensure proper documentation of the participant's responses. The survey materials were assigned a number and no participants' names were put on the surveys. The Principal Investigator worked with the interviewers on several occasions to emphasize the importance of thorough completion of the surveys, consistency in the presentation of survey questions, and proper recording of responses.

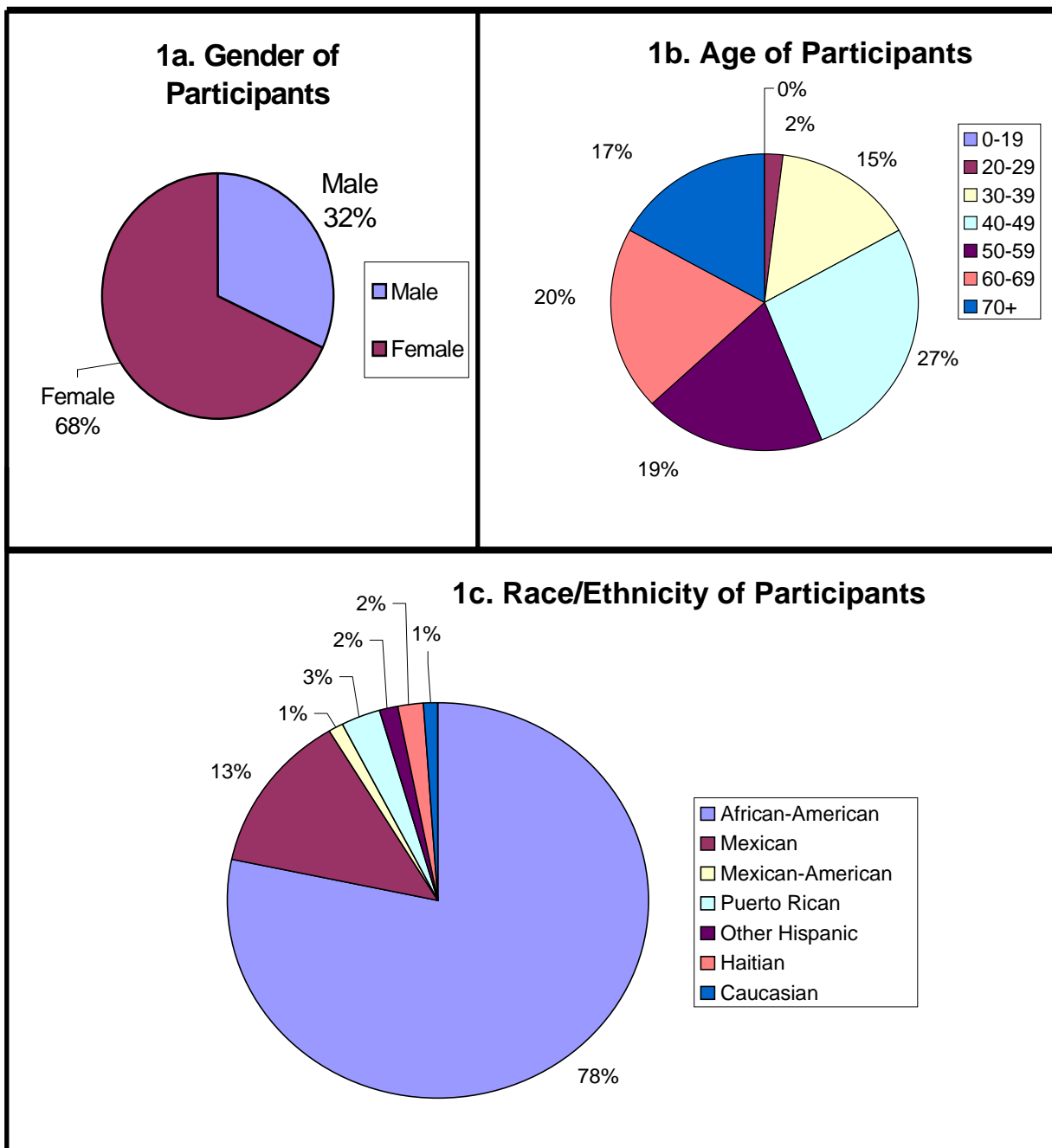
Survey participants. The survey was designed to document the health problems of African-American, Hispanic, and Haitian former Lake Apopka farmworkers, many of whom are experiencing significant and life-threatening health problems which they believe to be connected to their exposure to multiple sources of environmental contamination—direct pesticide spray in the fields; pesticide drift into the fields where they were working, as well as labor camps, and residential areas; utilization of agricultural pesticide containers in the home for various purposes; consumption of contaminated fish and other wildlife; toxic waste from nearby chemical manufacturers; potential groundwater contamination; an industrial landfill; a Stericycle medical waste incinerator; and two Superfund sites on Lake Apopka.

The participants were selected by the following methods: identifying former co-workers of the project leaders and interviewers; consulting a list of displaced Lake Apopka farmworkers provided by the Department of Labor during FWF's project with Central Florida Jobs and Education Partnership (1998—1999); referral of other former Lake Apopka farmworkers by survey participants; and word-of-mouth. The African-American participants were, for the most part, long-time residents of South Apopka. They were more likely to have a longer employment period working on the muck farms around Lake Apopka (as much as 30-40 years in some cases), and to be part of multigenerational farmworker families. The African-American farmworkers were more likely to have been exposed to very high levels of

organochlorine pesticides in the decades before these chemicals were banned in the United States.

The survey was translated into Spanish and Creole for those participants with limited English proficiency, and who preferred to respond to the survey in their native language. The Hispanic and Haitian survey participants arrived in the Apopka area more recently (generally since 1978), and worked on the Lake Apopka farms for a shorter period of time (generally 1-5 years). At the same time, in more recent years, these communities were more likely to have lived in labor camps neighboring the farms. All of the farmworkers interviewed live at or below the poverty level and have little formal education. Most do not have health insurance. Included in the group of survey participants were several undocumented immigrants who spoke little English.

Chart 1. Demographics of Survey Participants



Analysis, strengths, and limitations of the survey. Both quantitative and qualitative analysis of the survey data was conducted by a team of four FWAF staff members, the Project Coordinator and the Principal Investigator. The survey analysis is focused on workplace exposure to chemicals. The survey documented multiple health problems within the community, including doctor-diagnosed conditions, as well as self-assessment. Also, the survey results are based on farmworker households, not solely on individuals' health problems.

One of the significant strengths of the survey was training community leaders to be interviewers. Since the interviewers were familiar with most of the respondents, they were able to elicit and document personal information about people's health problems. This, also, put participants more at ease when talking about their personal and sensitive health issues. It is important to note however, that there were at least ten survey participants who ultimately decided that they did not want to participate in the survey because the questions were too personal. There were even occasions when participants' insisted that their survey be torn up because they did not want their personal health information to be included in the survey findings. Also, there were several occasions where participants did not want to answer the questions about reproductive health problems and problem pregnancies.

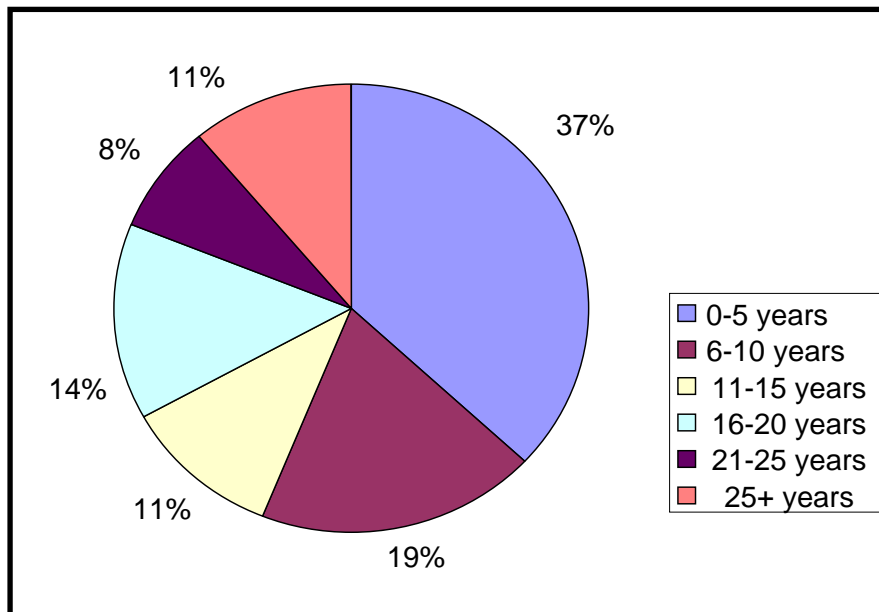
The survey participants were mostly African-American. There are several reasons for this. Most of the African-American community members that worked on the Lake Apopka farms are settled in the Apopka area, and most were easily identified and located. The Hispanic and Haitian communities were less likely to have put down permanent roots in the Apopka area. Most Hispanic former Lake Apopka farmworkers have relocated to other areas. Most Haitian former Lake Apopka farmworkers either relocated, or began working in other industries (such as hospitality) before the farms closed. Many Haitians were reluctant to participate because of a long-time misunderstanding that, following the closing of the farms, they were entitled to monies from the state that they never received.

FWAF staff and the Principal Investigator have interpreted the survey results based on data collected and their expertise, particularly that of the Project Coordinator, Geraldine Matthew. Ms. Matthew has been an employee of FWAF for 14 years, and has been a community organizer for 20 years. She is part of a multigenerational farmworker family, and as a child, would play in the fields while her mother worked. At the age of 16, Ms. Matthew got her first job as a farmworker, although she had been helping her mother in the fields since age six. She worked on the Lake Apopka farms for 34 years. Ms. Matthew has diabetes, and was just recently diagnosed with Lupus. She has two daughters with Lupus, a son with a thyroid problem, and a brother with a serious birth defect. Also, one of her daughters had a stroke at age three, and later was diagnosed with a brain tumor. Ms. Matthew not only served as the Project Coordinator, but also provided invaluable insight into the customs and realities of the Lake Apopka farmworker community, from exposure to chemicals, to common health practices and problems, to the subsistence consumption of wildlife from in and around Lake Apopka.

Based on Ms. Matthew's knowledge of the community's traditions and practices, there are some findings that appear to be underreported, as noted later in the report. In addition, some figures may be underreported due to respondents providing an answer they felt was appropriate or acceptable, rather than factual. Lastly, it is important to note that, at times and in various instances, it either was or seemed to be difficult for some respondents to speak freely about their health problems due to the sensitive and personal nature of the questions.

Farm work. The farmworkers surveyed worked primarily in the vegetable crop industry. The major crops grown on Lake Apopka farmlands were: carrots, radishes, corn, cabbage, different types of lettuce, parsley, cilantro, collards, potatoes, beans, bell peppers, cauliflower, celery, broccoli, cucumbers, peas, tomatoes, and beets. They performed various jobs on the Lake Apopka farms, such as: plowing, hoeing, planting, harvesting, loading, box-making, washing, grading, sorting, branding/bagging, canning, transporting, and applying pesticides and fertilizer.

Chart 2. Length of Survey Participants' Employment in Farm Work



Exposure to pesticides. Survey participants were exposed to workplace chemicals in numerous ways. Not only were they exposed at the worksite, but they also, in many cases, unknowingly brought these chemicals home on their clothes and shoes, which, in turn, exposed their children and others in the home to the pesticides. Common practices, such as washing work clothes with the family laundry and bringing home pesticide containers for domestic use, further exposed their families and/or housemates. Twenty-six percent (26%) of respondents indicated that they brought home pesticide containers for such uses as: holding drinking water or laundry detergent; storing things, such as food, clean clothing, diapers, and/or dirty laundry; or for use as a trashcan or mop bucket. This 26% is likely to be an underreported figure, since washing out pesticide containers to use for other purposes was a common practice in both the African-American and Hispanic communities.

Principal Investigator's comment:

After conferring with our community organizers and survey administrators, we believe that the aforementioned results (26%) may be underreported. Potential reasons that some survey participants may not have responded fully to this question include: not making the cognitive connection between bringing home large jug containers and their previous pesticide content; feeling ashamed or frightened of their previous use of pesticide containers for domestic purposes; not wanting to admit to something that could be construed as stealing; answering the question the way they thought the survey interviewer wanted to hear; and simply forgetting some of the particulars of daily existence many years ago.

Ninety-two percent (92%) of the participants surveyed indicated that they were exposed to pesticides in the workplace. The routes of exposure are detailed in Chart 3. It is important to note that there were few or no regulations that were being implemented to protect farmworkers' health and safety before the passage of Field Sanitation laws in 1987, and the federal Worker Protection Standards (WPS) in 1992. WPS regulations were not implemented until 1995. Prior to these dates, the use of pesticides and the provision of proper field sanitation facilities were widely unregulated. Later, even with the passage of strengthened health and safety protections, it was still years before toilets were common in the fields. Also, it was years before farmers commonly began practicing proper and effective posting of the re-entry intervals to notify workers of when they could safely enter pesticide application areas.

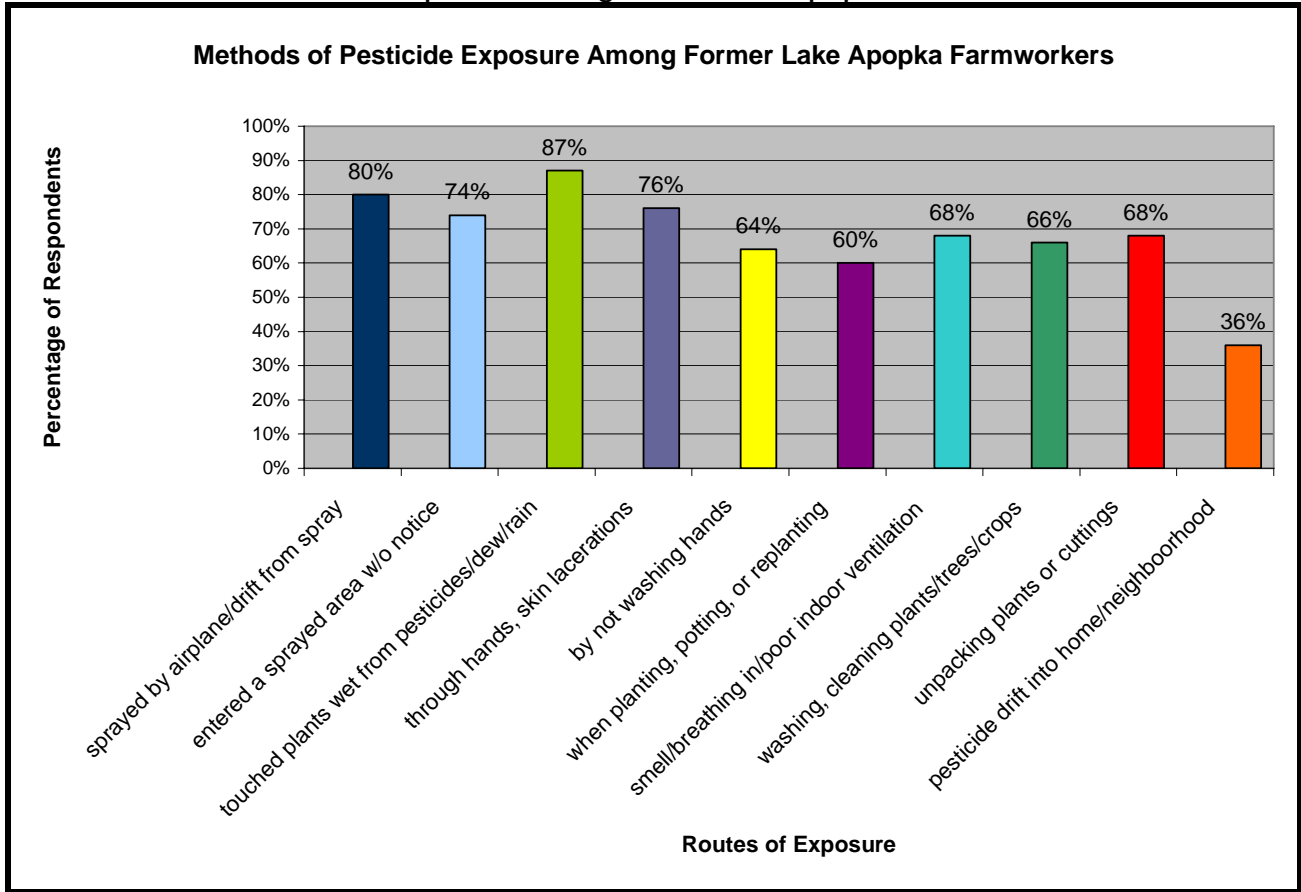
In 1999, four years after the implementation of the WPS, the Farmworker Association of Florida and the Farmworker Health and Safety Institute (FHSI) conducted 248 workplace assessment surveys and analyzed the data collected. The purpose of the surveys was to document violations of WPS and Field Sanitation laws. FHSI's report ***FARMWORKERS AT RISK: The Worker Protection Standard Four Years Later. Is It Really Protecting Our Nation's Farmworkers?*** highlights the following findings:

- only 54.5% of the farms surveyed conducted pesticide safety trainings for farmworkers.
- only 24.6% of the farms surveyed provided written information on pesticides.
- more than 60% of the farm operations surveyed did not inform farmworkers about the re-entry time after an area had been sprayed.
- farmworkers from 42.7% of the farms reported that they had been sprayed with pesticides (directly or indirectly).
- farmworkers from 51.4% of the farms reported that they had worked in an area still wet with pesticides.
- 22% of the farms improperly stored pesticides or other toxic chemicals on the site.
- farmworkers from 76% of the farms had access to a toilet at the worksite, but only 48.7% had access to a sink for washing their hands.

The Farmworker Association continues to identify innumerable employer violations of farmworker health and safety protections. However, at present, there are only 20 pesticide safety inspectors in Florida, under the Florida Department of Agriculture and Consumer Services, responsible for monitoring the practices of

more than 40,000 growing operations, plus golf courses. In 2005, only 600 farms (less than 2% of the total) were inspected for compliance with worker health and safety protections.

Chart 3. Methods of Pesticide Exposure Among Former Lake Apopka Farmworkers



Respondents' comments (excerpted from taped interviews):

We were in the fields when they were spraying.

Due to the fact of them spraying us, it got into our system.

No one ever told the workers what kind of pesticides and the dangers we were exposed to.

No, they didn't let us know. They'd just come over and begin spraying while we were working When we were working, they were spraying those fields.

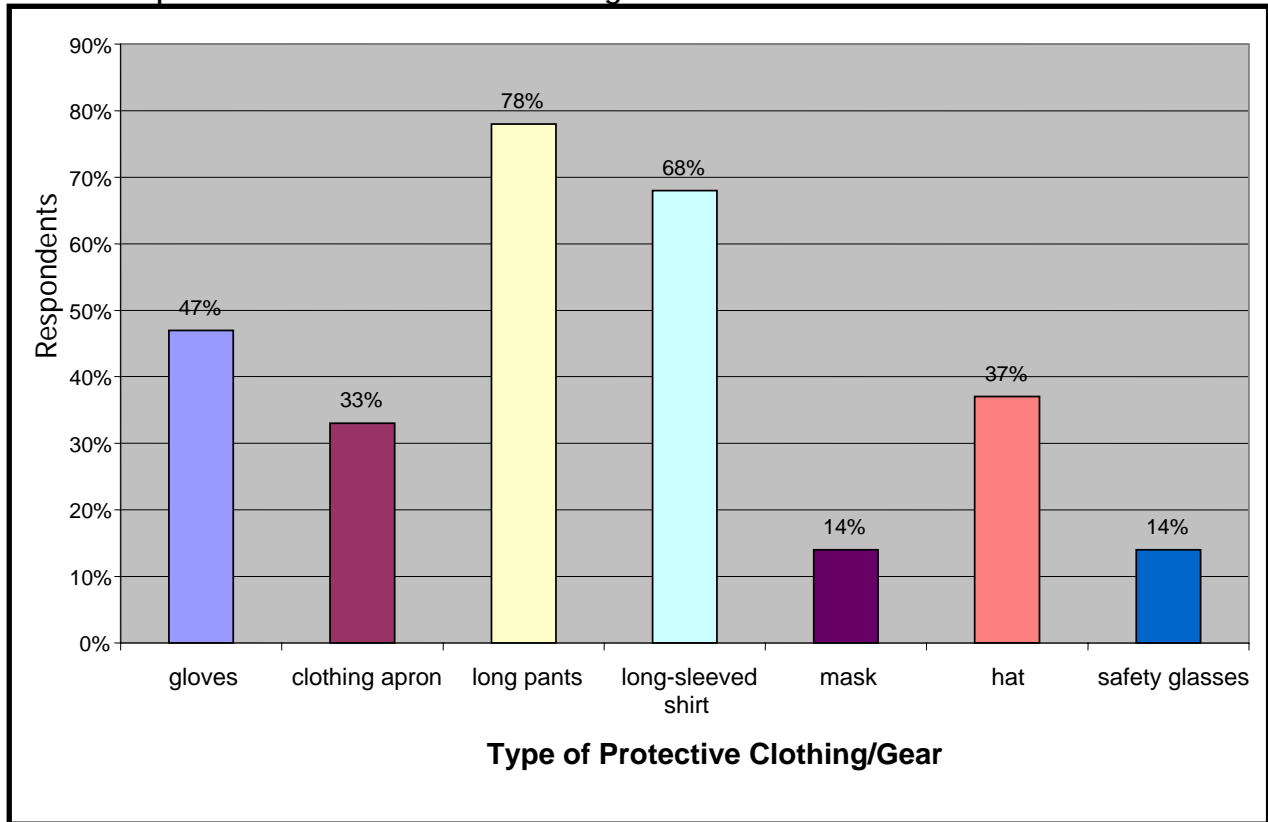
We used to live across from the packing building. When planes spread the pesticides, they were wet, but no one told us to seek shelter.

I told the news lady from channel 2 who came out to talk to me that I do believe some of my sickness is from the chemicals that were on the farm I was working in the carrot house and I stayed sick all the time. I had to keep going to the doctor because I just couldn't work out there. I would switch out of the carrot house and go to the field. I just couldn't deal with the wetness, the doctor told me that I had to stay out of the wetness.

When I was working in the muck, I got sick over the thing. I didn't know what was wrong, why they were spraying over me like that I know I was poisoned breathing that stuff (pesticides).

Although the importance of wearing protective gear is currently taught in pesticide trainings, prior to the implementation of the WPS in 1995, there was little education about precautionary measures passed on to farmworkers. The Lake Apopka workers customarily wore long pants and long-sleeved shirts as a way to protect themselves from pesticides and the elements. Gloves were not worn frequently by those picking most crops in the fields because it slowed down their pace of work and they were paid by piece rate which generally netted them very low wages, often below the hourly minimum wage. On the other hand, gloves were commonly worn by workers in the carrot packinghouse and those picking corn. Aprons were worn (mostly by women) to have a place to collect their tickets indicating how much they'd picked that day. Chart 4 indicates survey participants' responses regarding protective gear that was worn consistently on the job.

Chart 4. Respondents' Use of Protective Clothing/Gear



Exposure to other environmental contaminants. Not only were the respondents exposed in the past to agricultural chemicals in their workplaces, but they continue to be exposed to a variety of contaminants through various exposure routes due to the multiple neighboring polluting industries and hazardous sites located in the community. These sources of continuing potential exposure to pervasive toxins in their environment include: consumption of contaminated fish and wildlife from in and around Lake Apopka; potential pesticide drift from several

nurseries located adjacent to residential areas; volatile organic compounds from nearby fiberglass and plastics manufacturing companies and other industries located within the community; two local industrial landfills; two Superfund sites on Lake Apopka; two city sewage treatment plants; and a Stericycle medical waste incinerator.

The following chart (Chart 5) indicates community members' reported consumption of different types of fish and wildlife in and around Lake Apopka, and the frequency with which they consume(d) that fish and wildlife. Previous consumption denotes prior to the closing of the Lake Apopka farms, and current consumption indicates after the farms' closure. Despite community education about pesticides, water and soil contamination, fish advisories, and the bird deaths, a high percentage of community members continue to eat the wildlife for two primary reasons: 1) they are low-income, and the wildlife is an easily-available supplement to their diets; and 2) the custom is a tradition throughout many generations in the African-American communities, and even in the Hispanic community.

Chart 5. Respondents' Consumption of Fish and Wildlife In/Around Lake Apopka

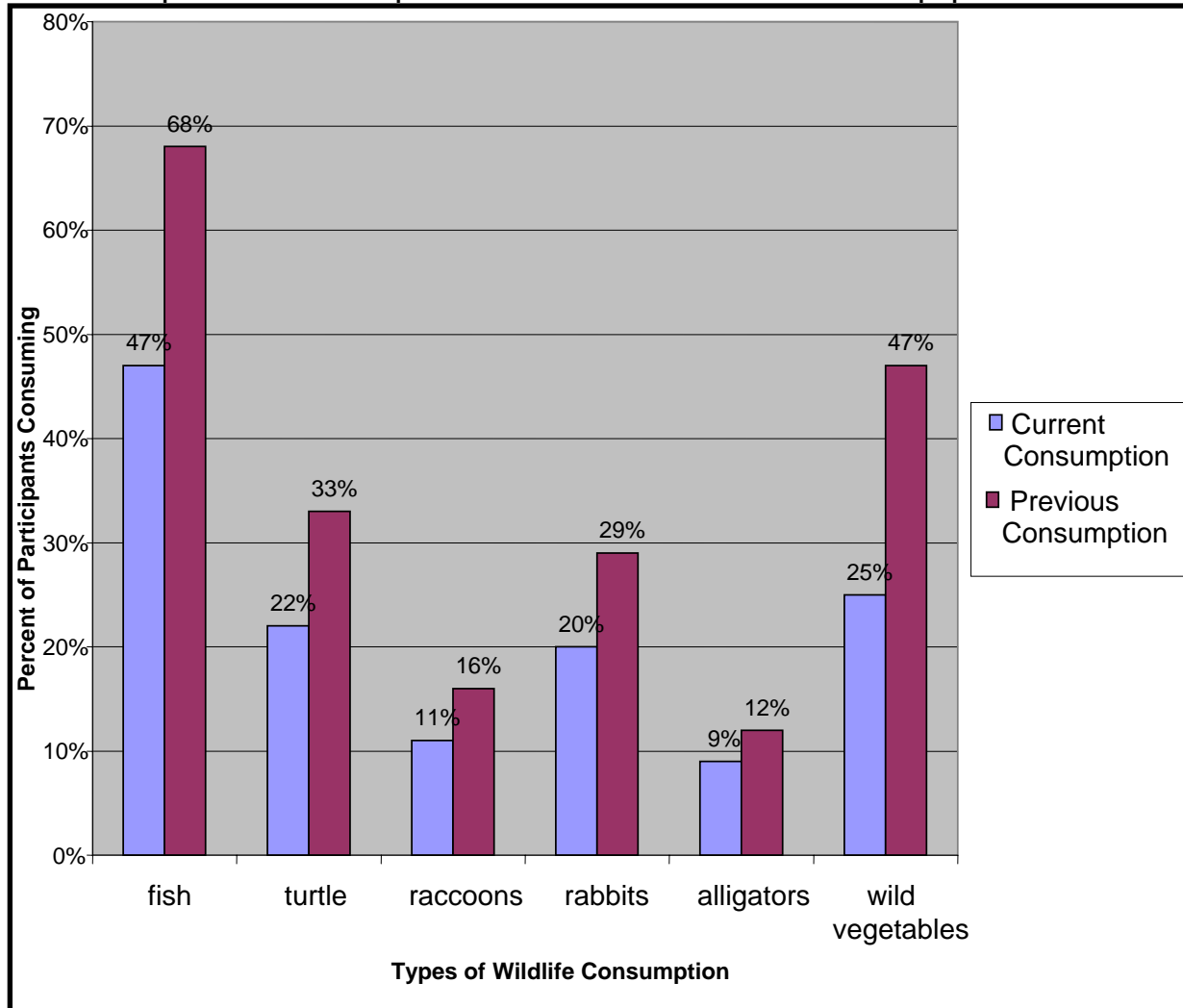
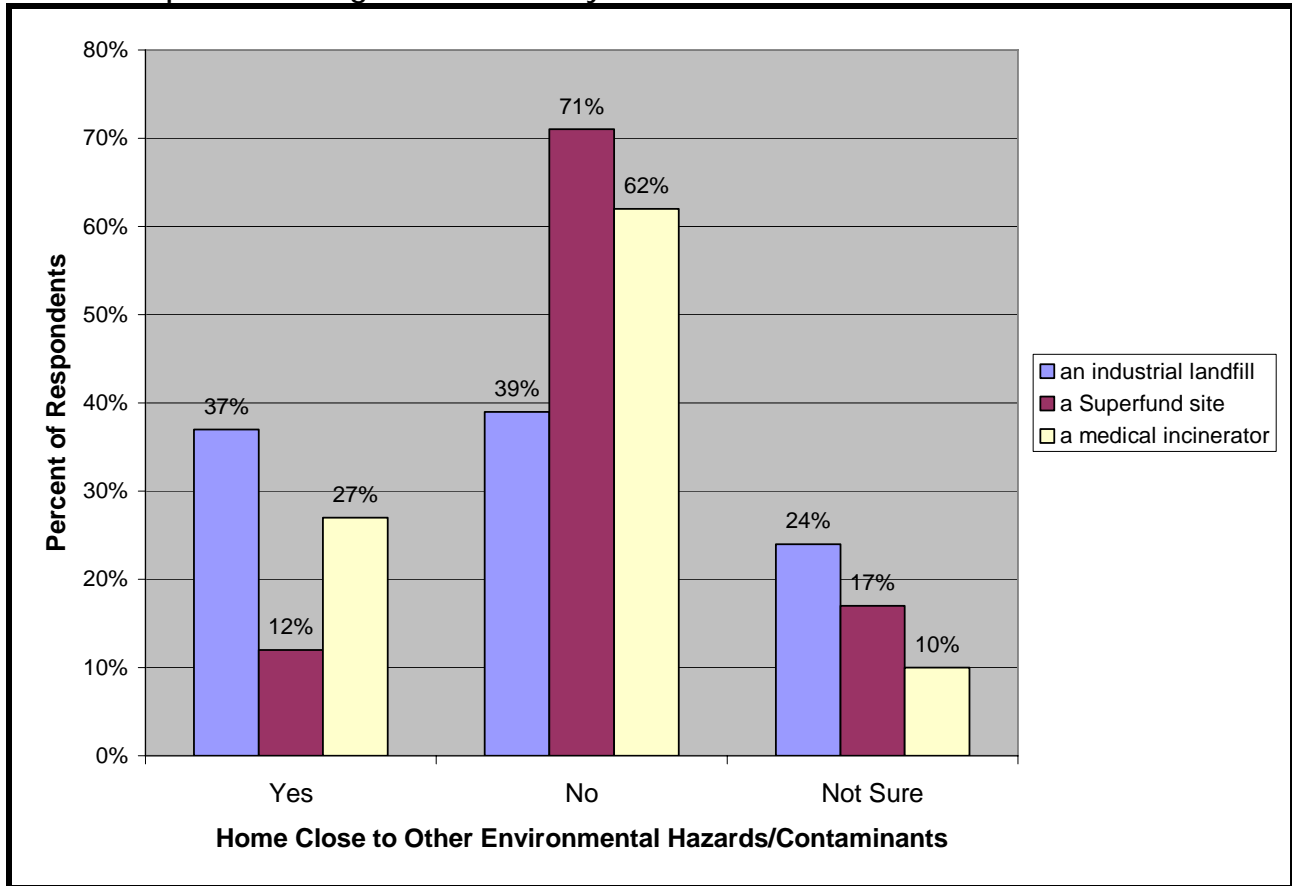


Chart 6 shows the percentage of respondents living near the landfill, the incinerator, or a Superfund Site. Positive responses may be underreported, because many participants were unsure of their proximity to these contaminated sites.

Chart 6. Respondents Living in Close Proximity to Other Environmental Hazards/Contamination



State of health. When asked to characterize the current state of their health, 83% of respondents stated that they were in either "fair" or "poor" health, as noted in Chart 7. Although 6% believe themselves to be in excellent health, when questioned further the survey revealed that nearly all nine of these respondents indicated multiple health problems. Thus, Charts 7 and 8 indicate the community's perception about their state of health, and about whether they believe that exposure to pesticides has adversely impacted their health.

Principal Investigator's comment:

The most powerful means of anthropological data collection is simply listening, without bias. Because people's perceptions of their lives are sacrosanct, some of the most important questions on the community health survey are those about how respondents feel about the current state of their health. Profoundly, over 80% of participants answered that they were either in fair or poor health. People's perceptions of their lives are the personal construct of their life experience within a particular cultural milieu; therefore, it is vitally informative that a large majority of the studied community believes themselves not to be physically well.

Chart 7. Self-Identified State of Health

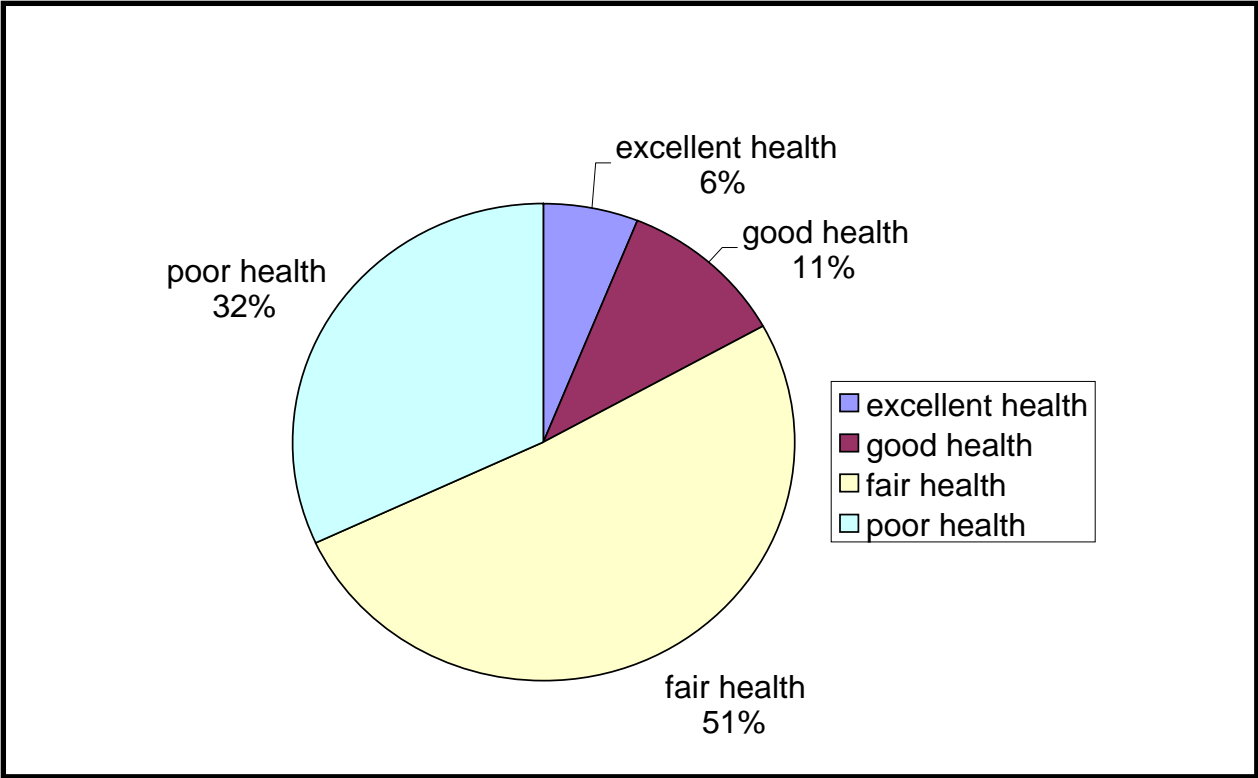
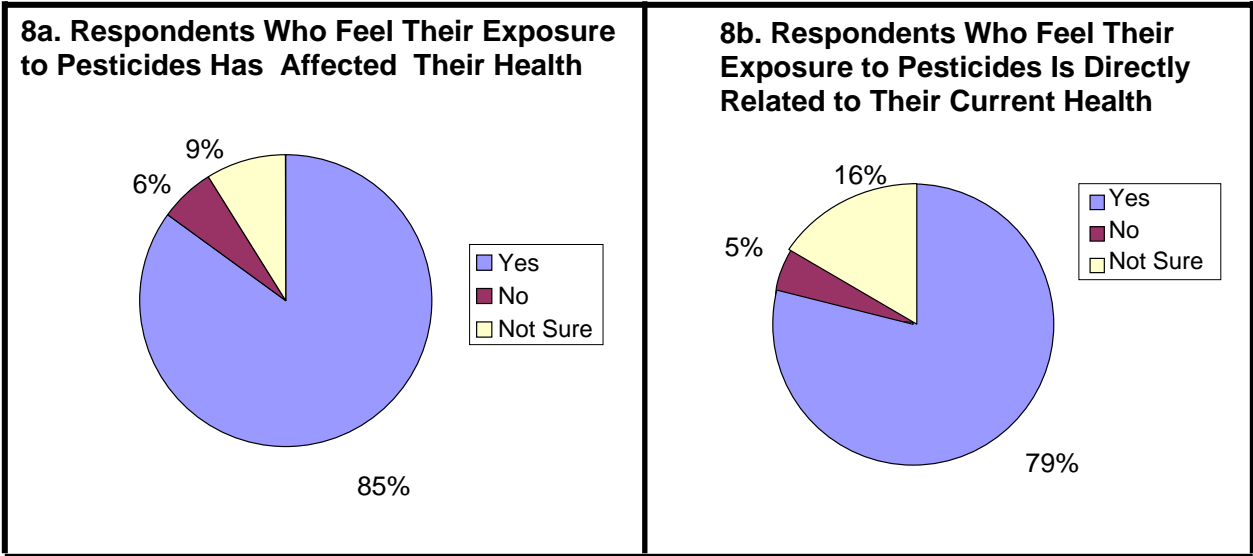


Chart 8. Community's Perception of Connection Between Pesticide Exposure & Health Problems



Unfortunately, current scientific studies have fallen short of establishing conclusive correlations between exposure to specific pesticides over long periods of time and particular human health outcomes. The data collected from this survey suggests that cumulative exposure to pesticides over a period of time can potentially be implicated in long-term human health effects. However, due to the lack of corroborated scientific support, doctors are hesitant to make definitive links between pesticide exposure and health problems of farmworkers. Often, health care providers in the Apopka area do not even ask questions about occupational history or consider occupational exposure to chemicals when treating a patient, as documented in the Together for Agricultural Safety Project's *Health Care Provider Interview Summary 2000*. In fact, most physicians, and other health care personnel, reported that they did not know about Florida's required reporting procedures for cases of suspected or confirmed pesticide poisoning. There is a lack of training on the diagnosis, treatment, and reporting of pesticide exposure for health care professionals in agricultural areas.

Respondents' comments (excerpted from taped interviews):

Before working there (Lake Apopka farms) I was healthy.

No, I did not go to a doctor. I did not know that I was working in something so deadly. I did not know that I would have all these aches and pains.

My husband and I have been seriously affected by our exposure to pesticides, working on the farms at Lake Apopka.

It was hard work and everybody in my family seemed to be sick one way or the other.

I was a healthy man. I am sure pesticides hurt my feet.

I can't tell if I have fair health or poor health. The only thing I know is that I'm hurting all the time and it did not come until I worked on the Lake Apopka farm.

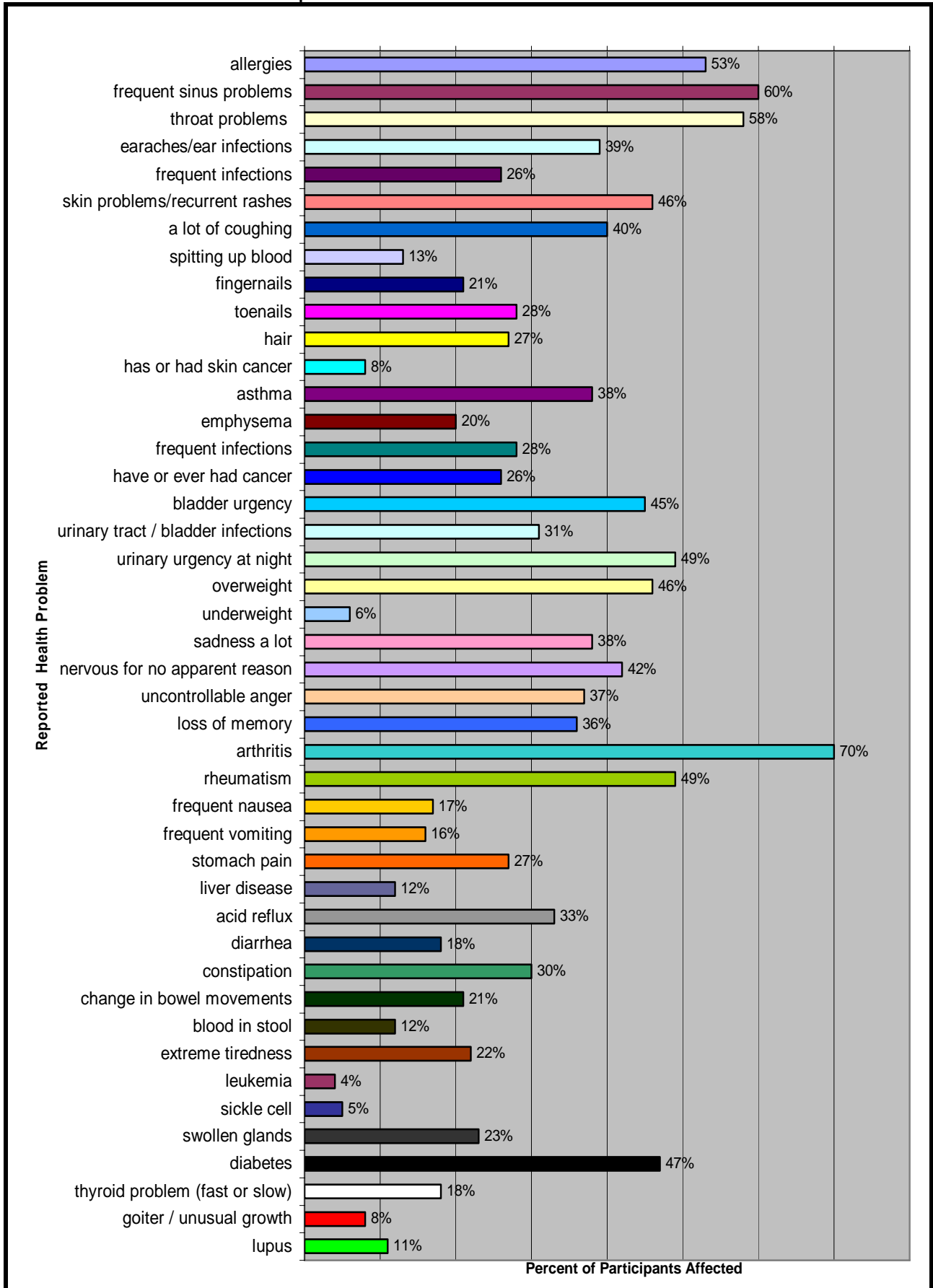
My health started to fail when I worked on the (Lake Apopka) farm.

My Daddy died on that muck, he was ate up with cancer.

I do believe that my children have the effects of the chemicals in their systems.

General health problems. The responses related to health problems detailed in the following chart (Chart 9) reflect the respondent's household, rather than solely the individual worker. For example, a respondent may have indicated that his/her son has asthma. Because the community has identified multiple health problems among farmworker children and grandchildren, the survey focused on farmworker families/households, not just individuals.

Chart 9. Health Problems of Respondents



Lupus. The African-American former Lake Apopka farmworker community has expressed concern that the rate of Lupus in the area may be higher than average. Although Chart 9 indicates 11 % of respondents live in homes where one or more persons have Lupus, the actual number of family members/housemates with Lupus reported in the survey was 22 out of 148 households, which is 14.8%.

Lupus is an auto-immune disease that can be very debilitating for its victims. In 1998, the Greater Florida Chapter of the Lupus Foundation of America established a local office in Apopka because more and more people in the area were being diagnosed with the disease. Though a blood test can determine the presence of the disease, it is difficult to make an initial diagnosis, because many of the symptoms of Lupus mimic those associated with other diseases. Lupus is sometimes referred to as “the disease with 1000 faces.” Precursor symptoms to those of Lupus are headaches, severe fatigue, weight gain or loss, hair loss, high blood pressure, and changes in color of the fingers in the cold. Skin rashes are a common symptom of Lupus, as is joint pain, which is often misdiagnosed as arthritis or rheumatism. Extreme fatigue, chest pain, swelling of the feet and legs, and weight gain are, also, symptoms of the disease.

People that have Lupus often go years, at great expense of their time and money, suffering from a variety of ailments, before they are tested for and given a conclusive diagnosis of Lupus. Farmworkers that may be suffering from these common symptoms, do not have health insurance to pay for the necessary doctor’s visits and testing to determine the cause or nature of their illnesses. Additionally, specialists that can diagnose and treat Lupus are not readily available at the local health clinics that the community customarily accesses.

Medication. Most of the respondents experience multiple barriers, such as financial, transportation, and/or language difficulties, that further contribute to their health care disparities. The fact of the community’s pervasive exposure to toxic agricultural chemicals and other contaminants in their environment must be considered along with the other circumstances of their living situation, including the general lack of: health insurance; access to quality, affordable health care and trained medical specialists; and the financial means and/or resources to purchase necessary medications. Chart 10 indicates the percentage of respondents taking prescription medications for particular illnesses.

Chart 10. Respondents Taking Doctors' Prescriptions

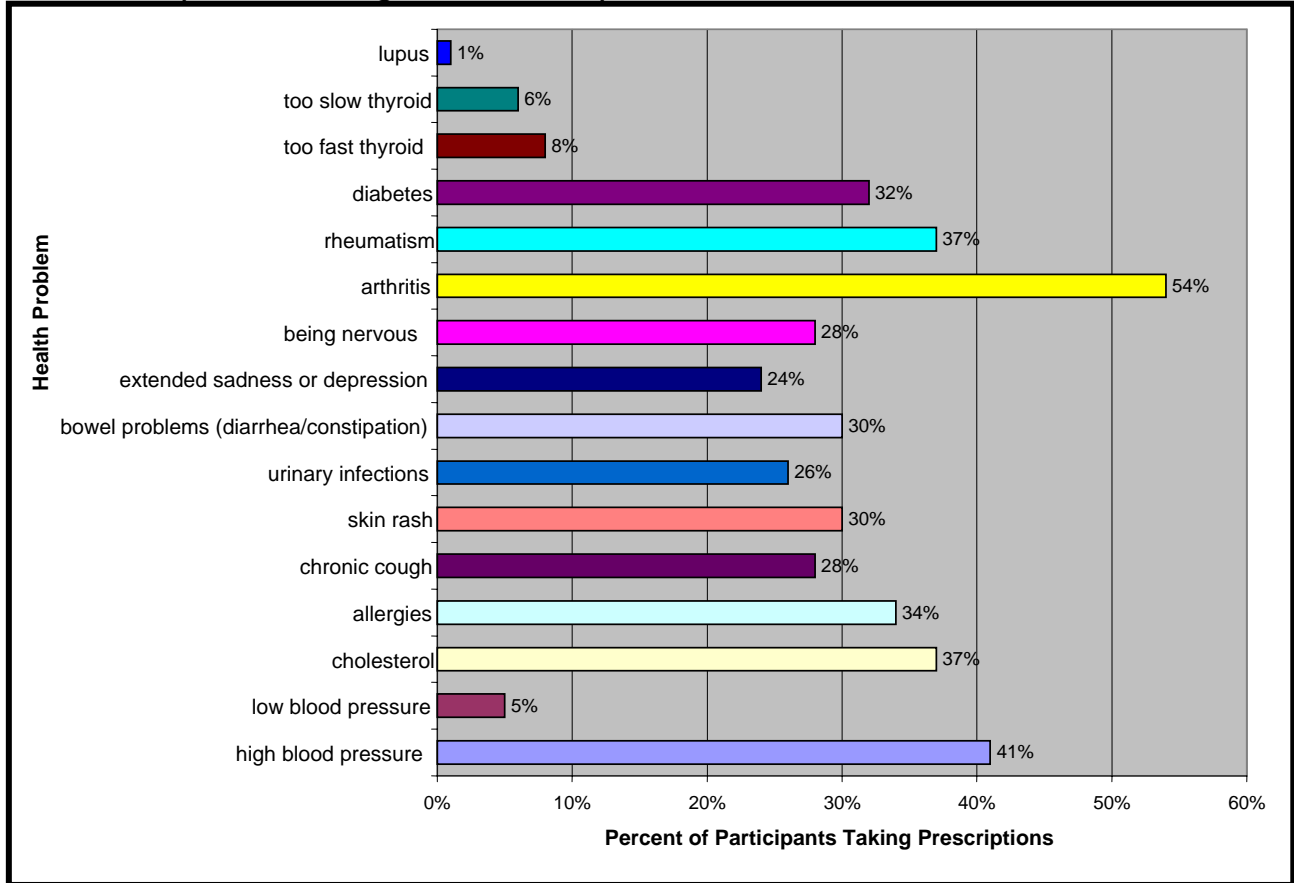


Chart 10, showing prescription medication use, compared to Chart 9, indicating reported health problems, demonstrates that many people are not taking prescription medications to treat the illnesses from which they are suffering. For example, 18% of respondents have one or more persons in their home with a thyroid problem, but only a combined 14% of respondents reported taking prescription medication for the problem. Also, 11% of the households have one or more persons in the home with Lupus, yet only 1% of the respondents reported access to appropriate prescription medications to treat the disease. The high rate of usage of prescription medicines for such health problems as high blood pressure, cholesterol, allergies, arthritis, rheumatism, and diabetes is indicative of the community's poor health overall.

Health Problem	Respondents suffering from this ailment	Respondents taking prescription for ailment
Arthritis	70%	54%
Throat problems	58%	for chronic cough 28%
Coughing	40%	
Allergies	53%	34%
Rheumatism	49%	37%
Diabetes	47%	32%
Skin problems/rashes	46%	30%
Thyroid	18%	14%
Lupus	11%	>1%

In addition to the disparities between those suffering from throat problems (58%) and coughing (40%) and those taking prescription medicine for chronic coughing (28%), more than 56% of respondents reported that they *regularly* take some form of over-the-counter cough medicines (syrup or cough drops). Similarly, while 46% of respondents indicated on-going problems with skin rashes and 30% use a prescription for skin problems, more than 49% of respondents reported that they *regularly* use over-the-counter creams to treat skin rashes.

Reproductive health problems. Charts 11, 12, & 13 depict respondents' experiences with the following reproductive health problems: birth defects, problem pregnancies, and problems with conception. Some participants did not want to answer questions about their reproductive health because of the sensitive nature of the questions. This reluctance on the part of some respondents may have resulted in some of the figures being underreported.

Chart 11. Respondents who Have Children Born with Birth Defect(s)

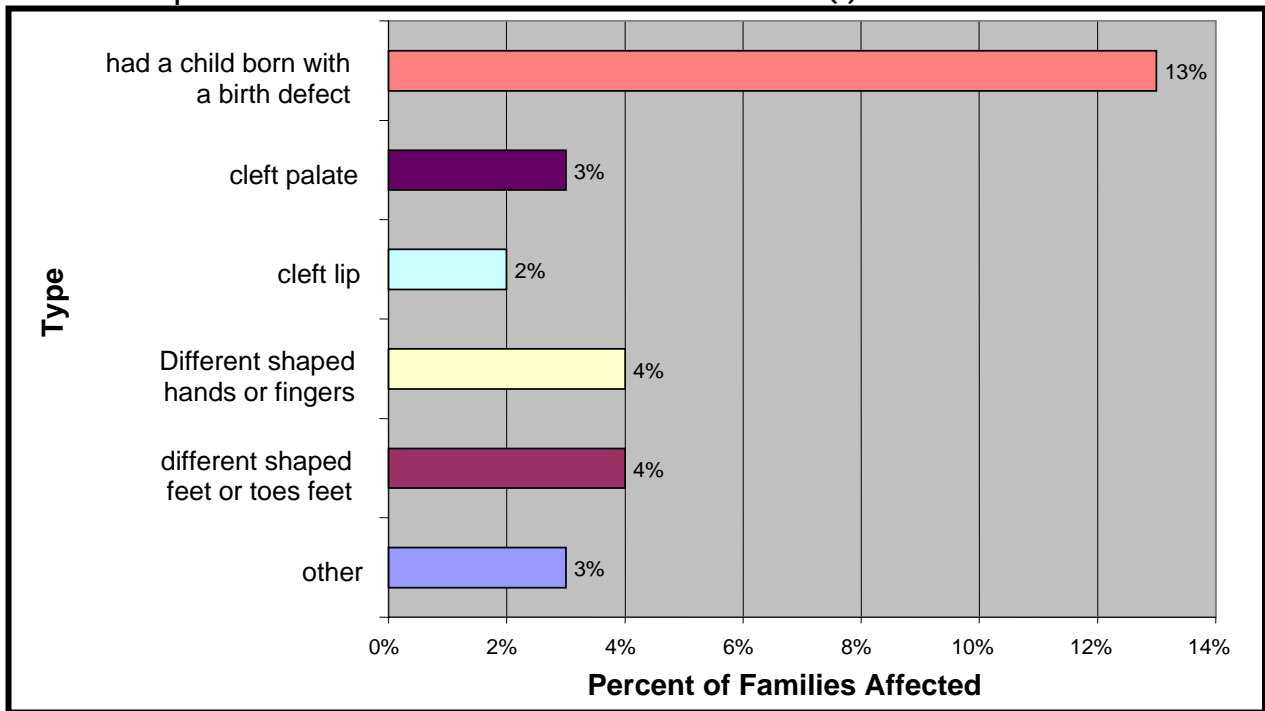


Chart 12. Respondents With Problem Pregnancies

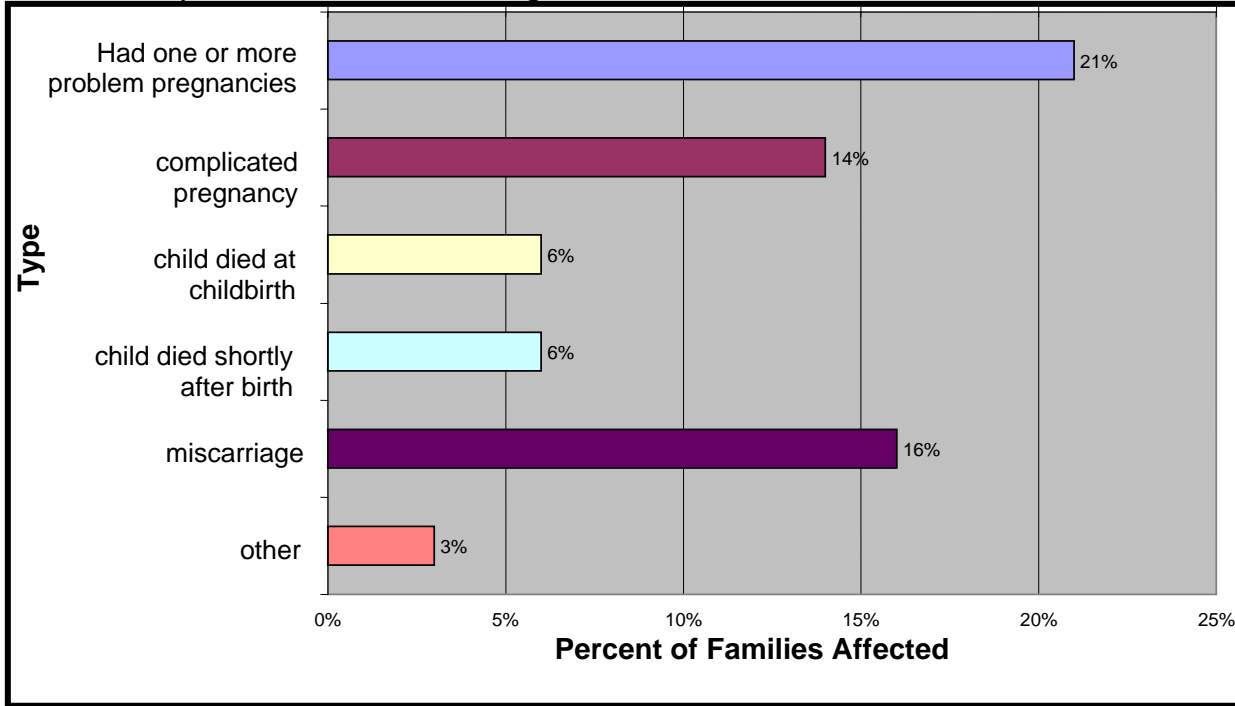
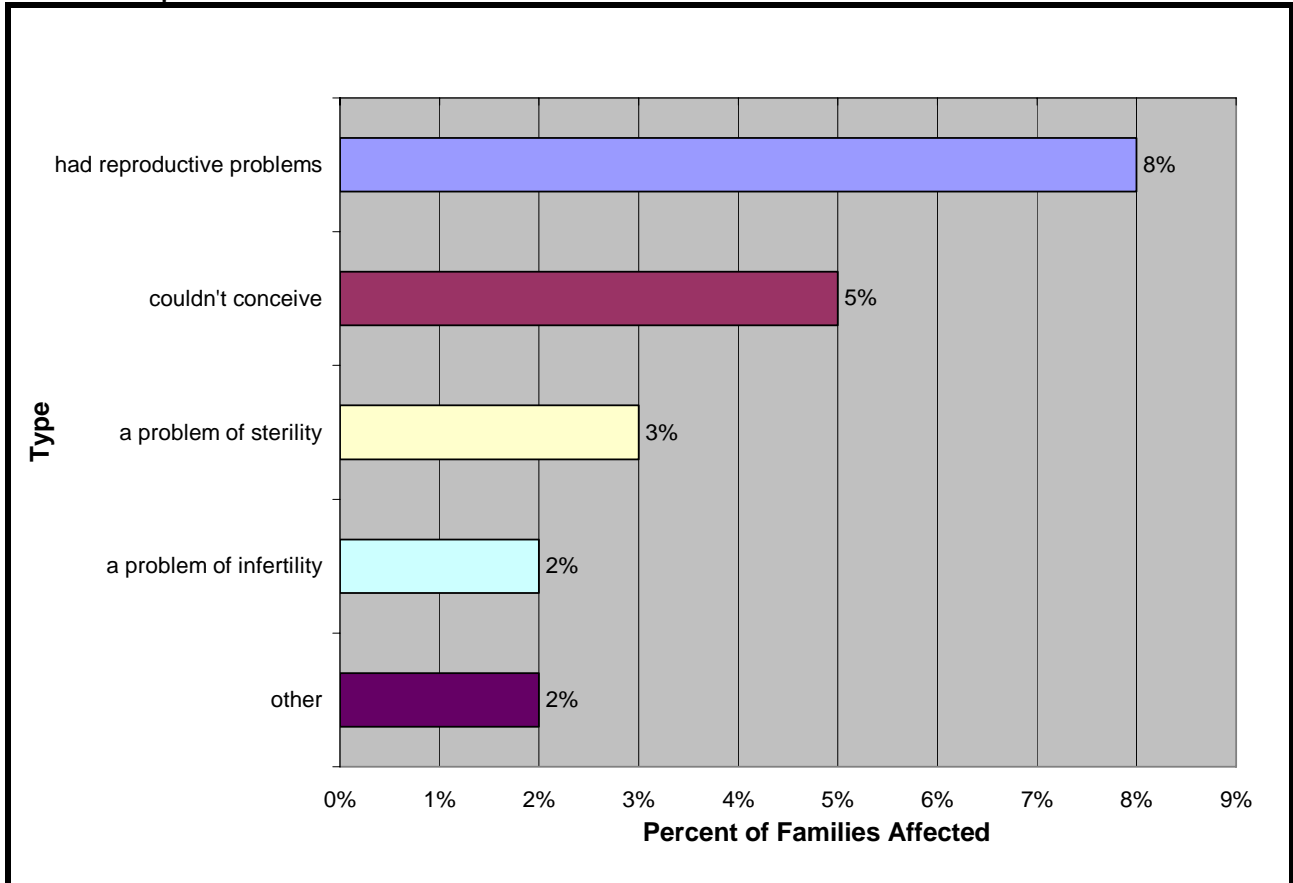


Chart 13. Reproductive Health



A non-profit organization, Birth Defect Research for Children, has done comprehensive studies of birth defects in concerned communities across the country. Their surveys indicate elevated rates of birth defects related to environmental exposures of the mother and/or father to differing types of contamination and/or pollutants. Additionally, three high-profile and recent, widely-publicized cases of birth defects in babies born to mothers working on the same farm in Immokalee, Florida, only serves to emphasize the need to research this area in greater depth.

Yet, Florida has lagged behind the curve in tracking, documenting, and investigating the incidence of birth defects in the state. In 1996, the state Department of Health received a grant to implement a statewide birth defect registry. Only recently has the registry made its data available to the public. In spite of this, any detailed analysis on the number of birth defects recorded and possible links to environmental influences is lacking. Florida is the third largest agricultural state in the country, with a correspondingly high rate of pesticide application. Tracking of birth defects in relation to environmental exposures of both mother and father has yet to be investigated.

Cognitive health problems. A great concern to the farmworker community is whether their exposure to workplace chemicals has had multi-generational effects, in particular effects on the cognitive abilities of their children. Charts 14 and 15 indicate the number of respondents who have children with learning disabilities and the number of respondents who have grandchildren with learning disabilities. The learning disabilities reported by the respondents include Attention Deficit Disorder, inability to read or write, slow learning, speech impairment, confusion/inability to comprehend, and hyperactivity. More than 75% of the cases documented through the surveys were diagnosed by physicians, teachers, and other school personnel; the remaining were assessed by parental observation.

Chart 14. Respondents Who Have Children with Learning Disabilities

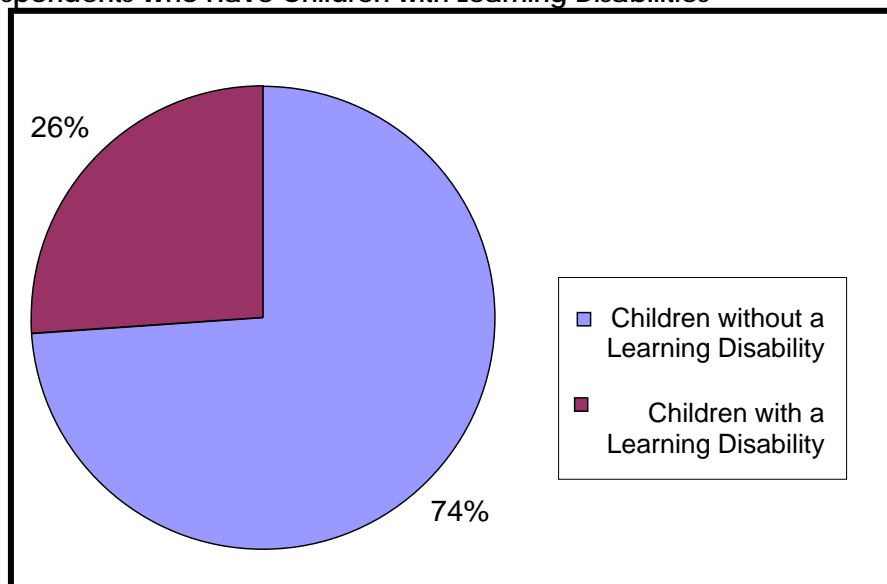
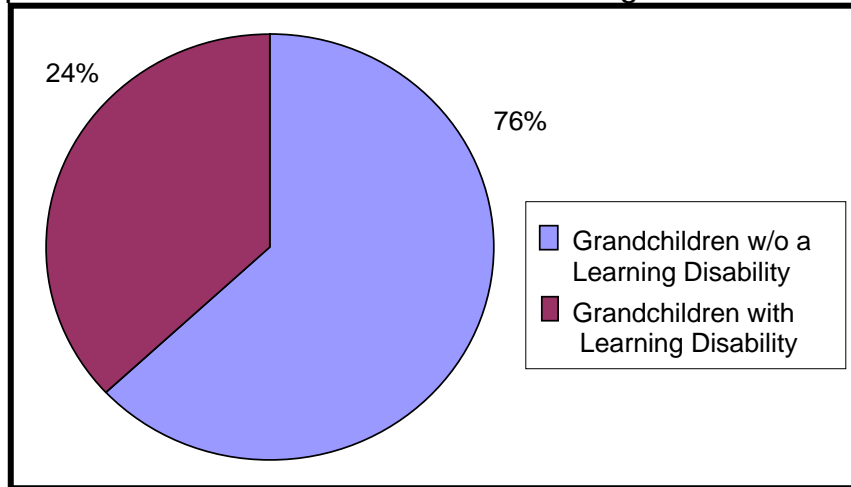


Chart 15. Respondents Who Have Grandchildren with Learning Disabilities

*Principal Investigator's comment:*

The results of the survey questions about learning disabilities demonstrate a disturbingly high propensity of former farmworkers to produce learning disabled children. The former farmworkers of Lake Apopka have a noticeably high proportion of their children and grandchildren showing demonstrative behavior that is formally diagnosed as learning disabled. Of all households queried, a full 26% report at least one learning disabled child in residence. A significant number of children are challenged in the fundamental cognitive areas of reading, writing, and/or speaking.

The results of our survey also demonstrate a frightening multi-generational trend. Of all households surveyed, 24% report at least one learning disabled grandchild. That statistic nearly mimics our findings of learning disabled children. Further, out of all households with grandchildren, a stunning 37% report at least one grandchild with a learning disability.

Deaths. One area of information missing from this project is the number of former Lake Apopka farmworkers who have died, prior to, during, or after the closing of the farms, their ages at the time of death, and the cause of death on record. This is significant information that warrants further investigation. Anecdotal accounts from community members suggest a high mortality rate of former farmworkers, in addition to, a notable number of severely disabled former workers who might not have been in a position, due to serious health problems, to undergo the survey interview process. Valuable data sets, therefore, could be missing that would lend further weight to any conclusions about health impacts that might be drawn as a result of this survey. Any future health study of former Lake Apopka farmworkers should include analysis of the records of the deceased.

Conclusion. The *Lake Apopka Farmworkers Environmental Health Project* arose out of the need of the community to be heard and for their health concerns to be addressed. These concerns emanated from two sources: 1) People's direct experience and observations of friends, family, co-workers, and themselves who

appear to be suffering, at unusually high rates, from a variety of illnesses, diseases, and recurring health problems; and 2) The unprecedented bird mortality in the community which was eventually definitively linked to organochlorine pesticides on the farm fields to which the farmworkers themselves had been exposed during their working careers. Much research time and money went into identifying the causes of the bird deaths, yet there has been no comprehensive study of the health effects on farmworkers. This is an imbalance and injustice that needs to be rectified. For years, multiple requests to local, state, and national government agencies to conduct an assessment of Lake Apopka farmworker health went unheeded. With this project and report, it is hoped that some of the people's concerns may at last be heard and addressed. Ideally, this project will generate increased interest in the community's concerns leading to constructive actions that will improve the health of individuals and of the community as a whole.

The results of this community health survey raise many questions: How many community members may be suffering from diseases that have gone undiagnosed? Which illnesses can be linked to pesticide exposures or immune system suppression due to exposures over long periods of time? What part do organochlorine pesticides play in the health problems of this community? Have endocrine-disrupting chemicals had an impact on the second or third generations of farmworker families? What cumulative and synergistic impacts have exposure to the various agricultural chemicals had on the community's health overall? What health hazards have these farmworkers endured to enable us to have an affordable and reliable food supply?

These are just some of the questions raised by this report. One conclusion that we can draw is that more study needs to be done. Fifty years of providing food for the people of this country should be repaid by focusing attention on the health needs of this hard-working group of people. We recognize that there is no easy solution to the complex health problems experienced by the former Lake Apopka farmworkers. However, our collective hope is that, through the release of this document, enough effort and resolve will be generated to undertake significant and positive next steps to assist the community in their quest for answers regarding their health. With that in mind, we submit the following recommendations.

**PROPOSED ACTIONS NEEDED TO ADDRESS THE IDENTIFIED PROBLEMS
IN THE LAKE APOPKA FARMWORKER COMMUNITY**

Though the causes and sources of people's illnesses are of significant importance in the long term, the most pressing and immediate issue of concern for the former Lake Apopka farmworker community is their current state of health. In the eight years since the closing of the farms on Lake Apopka and the devastating bird death incident that followed, there have been no actions, interventions, or other efforts on the part of state and/or local government to address in any comprehensive way the community's actual and/or perceived health problems. Aside from a recommendation in 1999 that individuals refrain from eating large quantities of Brown Bull-head Catfish from Lake Apopka, there has been no outreach to this population to even determine the nature and extent of illness and disease that they are experiencing. The following is a list of actions and/or steps, arising out of the results of this work, that are herein proposed to be undertaken by appropriate agencies in order to remedy the years of neglect that this community has experienced.

Actions to Address the Health Needs of the Lake Apopka Farmworker Community

- Improve the accessibility of the community to local health care clinics and local health department facilities including:
 - shorter waiting times for appointments
 - financial assistance for those unable to pay even minimum fees
 - increased availability of specialists to address people's specific health needs, such as, dermatologists, rheumatologists, endocrinologists, and auto-immune specialists
 - reliable and consistent sources and resources for obtaining critical prescription medications (blood pressure and diabetes medications, for example)
 - improved diagnosis of diseases, including requiring a questionnaire about work history within the medical history requirements
 - access to timely testing to improve disease diagnoses and health care treatment
 - availability of transportation alternatives for those with serious mobility issues

Develop and conduct a comprehensive community health study of the former Lake Apopka farmworkers to look at both the health of adults and the incidence of health problems in their offspring, and to test participants for body burden levels of toxicity. Any such study should include input from the community and have two clear objectives

- to determine the extent and nature of chronic and acute illness and disease present within and among this community,
 - to explore the relationship between exposure to environmental toxins and the community's health, both individually and intergenerationally.
- Conduct more targeted testing and monitoring of soil, well water, groundwater, and air pollutants in South Apopka, and in the surrounding communities, especially those adjacent to Lake Apopka. Report these results to the community. Clean up areas of contamination.
 - Develop an educational and outreach campaign specifically designed for this community to:
 - meet as frequently as necessary with concerned community members to respond to their questions and health concerns, and work together to resolve problems
 - to inform them of their health care options
 - to discuss preventative and treatment measures, and to open frank and honest dialogue between health care providers and community residents
 - improve communication at all levels with the goal of improving health care outcomes

PROPOSED CHANGES NEEDED TO ADDRESS THE GENERAL HEALTH OF FARMWORKERS

Based on the survey data collected, anecdotal stories of health problems, and more than 20 years of experience working with various farmworker communities, we make the following recommendations to improve overall farmworker health:

Health Education/Training

- Ensure better training for health care providers in agricultural areas on the detection, treatment, and reporting of pesticide exposure and pesticide-related illnesses.
- Allocate more government dollars to grants to community-based organizations to conduct health outreach and pesticide trainings with farmworkers.
- Improve employer-provided training, in appropriate languages, about pesticide safety for farmworkers and pesticide applicators. Trainings should be conducted by independent persons or groups where possible, to prevent conflict of interest.

Health and Agricultural Practices Research

- Fund more scientific health studies of farmworker populations, focusing on the cumulative and synergistic effects of pesticide exposure, as well as the physical and cognitive multigenerational effects of chronic pesticide exposure.
- Strengthen farmworker housing regulations, and implement more stringent requirements when housing is on the site of or neighboring farms/fields.
- Increase research into sustainable agriculture practices.

Increased Enforcement of Farmworker Protections

- Increase enforcement of the laws protecting farmworkers, through the hiring of a sufficient number of state agricultural inspectors, in order to adequately monitor facilities throughout the state, and to impose greater penalties for violations of those protections when they occur.
- Allocate more government dollars for enforcement of farmworker health and safety protections.
- Conduct farm inspections without giving prior notice to farm operators.
- Impose greater restrictions on the water, air, and soil pollution caused by farming.
- Enforce implementation of the WPS provision that information about workplace chemicals be provided to farmworkers, in the appropriate language and in a format that they can take to their health care provider.
- Improve re-entry interval signage appropriate for illiterate workers.

Other

- Conduct independent evaluation of pesticides' effects on the environment and human health, prior to their authorized use.
- Implement a tax on agricultural pesticide manufacturers and consumers to be used for training, research, and enforcement to protect farmworkers.
- Revise zoning laws so that residential areas are not so close to polluting industries and environmentally-contaminated sites.

APPENDIX A

Background on Lake Apopka Farms and the Farmworker Community

Lake Apopka Farms. For over half a century, the north shore of Florida's fourth largest lake, Lake Apopka, was cultivated for the agricultural production of vegetables, including corn, carrots, cucumbers, radishes, and lettuce. During World War II, in an effort to increase crop production to support the war effort, the northern marshlands of the lake were drained to expose the rich muck soil bottom. A series of dikes and levees was constructed to separate some 20,000 acres of land from the lake itself. Water from the lake was pumped on to the fields for irrigation purposes and then, back into the lake to keep the water from flooding the cultivated fields. Thus, crops that were planted in this fertile soil were grown on land that was actually below the normal lake level. In the 1950's, the lake was so healthy that it was considered one of the premier bass fishing lakes in the country. However, the alternating cycles of flooding and draining of the fields with lake water resulted in decades' worth of run-off of fertilizers and pesticides. The result was that Lake Apopka became noted as the state's most polluted large body of water.

Public pressure to clean up the lake began as early as the late 1960's. Algae blooms in the phosphorous-rich water gave Lake Apopka its notorious pea-green color, but the color was just the visible symptom of a lake ecology that had drastically been altered. By the 1980's, the once-abundant bass population was gone, and in its place was a burgeoning population of shad, generally considered a "trash" fish. Recreation on the lake had virtually come to a halt, and the former tourist industry had gradually disappeared. Though many different solutions were proposed to clean up the lake, none were economically feasible and the lake continued to deteriorate. Finally, in the 1980's, the St. Johns River Water Management District (SJRWMD), the government agency charged with oversight of the water body, implemented a pilot Marsh Flow-way Project in an effort to address the problem. The District converted former farm land into a man-made marsh to serve as a filtering system. Lake water was pumped into the flow-way, and the natural filtering processes served to rid the water of the suspended phosphorous particulates. At the end of the cycle, cleaner, filtered water was pumped back into the lake. The pilot project was considered successful, allowing for construction of the full two-stage project to go forward. The Marsh Flow-way Project, once completed, is projected to "recycle" the total volume of lake water through the flow-way system twice yearly.

In addition to the Flow-way project, the SJRWMD imposed stricter regulations on the farming operations in an effort to reduce the nutrient load to the lake. A combination of this pressure on the farmers, growing public impatience for a solution to the lake's problems, and the increased visibility of this local dilemma, led to the passage of legislation for the allocation of state monies to purchase the farmlands on the lake. In 1996, then Governor Lawton Chiles signed into law the Lake Apopka Restoration Act, with a mandate to the SJRWMD to pursue land purchases from the growers. By the end of two years, with a combination of state and federal monies totaling over \$100 million, the District had acquired most of the 15,000 acres of farmland that were to be included in the restoration project. Farm owners, that had originally obtained their lands for dollars on the acre, received millions of tax-payer money for the land, equipment, and buildings from which they had profited for years.

The SJRWMD conducted environmental analyses on the farm lands prior to completing contracts with the farmers. A. Duda & Sons Farms, the first to be purchased, incurred significant costs in environmental clean-up in order to comply with the standards that were set by the District. The other growers, seeing this, negotiated with the agency for

contracts that set financial limits to the amount of clean-up costs for which they would be responsible.

The End of Farming. May 31, 1998 was the official culmination of farming on Lake Apopka. After 50 years of the seasonal cycle of planting, harvesting, and packing of produce, all cultivation of crops came to a halt. Workers, who earned a living from these farming operations for years and even generations, lost their livelihoods and some, who lived in company-provided housing, even lost their homes. The Farmworker Association of Florida began working to address the needs of some 2,500 Lake Apopka farmworkers in 1996 with the passage of the law. In multiple meetings and conversations with local and state agencies and officials, FWF was finally able to advocate for a retraining/re-employment program which was implemented in the summer of 1998. Later, through the Federal Relocation Act, the organization was able to help secure relocation assistance for some 70 farmworker families. However, farmworkers' concerns were soon to change focus in the winter following the farm closures.

Bird Mortality. Altering the decades-old pattern of flooding in the summer and draining of the fields in the winter, the SJRWMD, in the winter of 1998, flooded portions of the purchased farm lands for the purpose of attracting migrating water fowl. That winter, the Audubon Society's Annual Christmas Bird Count on Lake Apopka tallied the largest number of migrating birds ever recorded at an inland location. However, it was also during these birding trips that participants began to notice dead and dying birds. What followed was one of the worst bird death disasters in recorded U.S. history. By the end of the winter, over 1,000 fish-eating birds had died, including Great Blue Herons and Bald Eagles, with the majority being White Pelicans. Local, state and federal agencies were mobilized into action, and the fields were drained to lessen their attraction to water fowl.

Extensive soil and water testing revealed a 10-acre "hot spot" of the pesticide toxaphene on a former air strip of one of the farm lands. Toxaphene, which had been banned years earlier, was one of several organochlorine pesticide compounds that were identified in the tested bird tissue. Others included endrin, aldrin, dieldrin, DDD and DDE. The U.S. Fish and Wildlife Service (USFWS), under the Migratory Bird Act and with \$1.5 million in government funding, undertook an intensive investigation that lasted for several years. Finally, in June 2001, a report by the USFWS determined that, indeed, organochlorine compounds were responsible for the unprecedented bird mortality. However, there still remained unanswered questions as to the impacts to the second generation of the birds that had survived though they had been exposed to the toxins.

Farmworker Health. Farmworkers were regularly exposed to the same chemicals implicated in the bird deaths. Yet, in all the discussion of the death of the birds, human health, specifically that of the farmworkers, was not addressed. FWF tried to work with local agencies to enact precautionary measures for the community, who were known to continue to fish from the lake and to eat their catch. Overtures to the local health department to alert the community to avoid the lake and its environs were not acted upon for eight months. And, then, the action was inadequate at best. The health department issued a statement discouraging people from eating too many Brown-bullhead catfish, as their assessment was that other fish from the lake did not pose a threat to human health.

Fishing was and continues to be a food source for farmworkers and other people in the communities surrounding Lake Apopka. In general, the traditional way of preparing their catch included use of the whole fish. Toxins are stored in the fatty tissue of most organisms. This becomes significant if farmworkers, who were exposed to pesticides in

their work environments, then risked further impacts to their health through the consumption of fatty tissue in both fish and wildlife. Though any single mode, method or dosage of exposure may not prove a health risk, the combination of factors increases the body burden of chemical contamination that can lead to suppression of the immune systems in humans.

Long concerned about the impacts of pesticide exposure on workers, the Farmworker Association of Florida, in conjunction with a university, attempted multiple times to secure funding for a comprehensive health study with the former farmworkers. To date, such a study has yet to be funded. Thus, many pressing questions still remain and farmworkers' health concerns and health problems continue to go unaddressed.

Sources of Contamination. For years, clean-up efforts on Lake Apopka focused on the phosphorous content of the lake. However, the algae blooms from phosphorous excesses were only the most visible of the lake's problems. Two Superfund sites are located in the vicinity of Lake Apopka. The Tower Chemical Company superfund site, a 30-acre site on the south shore of Lake Apopka at Gourd Neck Springs, is notorious for a chemical spill that released DDT into a wetland adjacent to the lake. In 1980, the EPA investigated the site and determined that there had been significant contamination to both surface water and ground water. The Drum Chemical Company Superfund site, on the north shore of the lake and across from the farm land, is a site of chemical contamination, resulting from the commercial operations of the cleaning of pesticide drum containers. To date, both sites have been only partially remediated and are being periodically monitored by the EPA. In 1999, monitoring wells at the Drum Chemical Company Superfund site indicated movement of a plume of contaminated groundwater below the site.

Alligators and Lake Apopka (Endocrine Disruption). Researcher, Dr. Louis Guillette, of the University of Florida, was also interested in Lake Apopka. His research on alligators on the lake, beginning in the late 1980's and into the 1990's, uncovered disturbing data. Reproductive rates of alligators on the lake were far below that of similar alligator populations on pristine Lake Woodruff. Even more startling were the genetic abnormalities he was finding. Male alligators with elevated estrogen levels and stunted sexual organs, female alligators with abnormal hormone levels, and genetic mutations of both males and females were at statistically high levels in the alligator populations he studied. Continued research led him to conclude that breakdown components of DDT – DDD and DDE – were implicated in the mutations and abnormalities. His work became one of the seminal pieces of research in the ever-unfolding evidence of the impacts of hormone-disrupting or endocrine-disrupting chemicals in our environment and on the health of wildlife.

Our Stolen Future, a renowned book by Theo Colborn, Dianne Dumanoski, and John Peterson Myers is a chronicle of similar findings in wildlife colonies around the world. Endocrine-disrupting chemicals mimic hormones in the body and link to receptor cells, fooling the body and activating certain hormonal reactions. Many organochlorine pesticides are included in the category of endocrine-disrupting chemicals. It is significant to note that endocrine-disrupting chemicals impact the offspring of individuals that have been exposed.

Other Relevant Research

Pesticide Studies on Children in Mexico. Until very recently, few, if any, studies explored the impacts that pesticides have on human health. During the late 1990's, Dr. Elizabeth Guillette conducted an innovative study on Yaqui Indian children in a rural area of Sonora, Mexico. Two populations of the same tribe of people lived in two very different

environments. One community lived in the valley and worked in farm fields in which pesticides were regularly applied. The other, genetically similar, community of people lived in the mountains in a relatively pristine environment. Working with the children in each community, Dr. Guillette devised a series of games to test the children's cognitive abilities and motor skills. The results were dramatic. Children who had been in the exposed environment performed distinctly poorer on all tests, including the drawing of human figures. The mountain children were not only able to perform all tasks more rapidly and better, but the figures they drew, unlike their valley counterparts, looked more like humans, with eyes, arms, legs and hair.

Students' Project. In 2005, following Dr. Guillette's guidance, two students from Lake Brantley High School in Orlando undertook a school science project based on Dr. Guillette's study of the Yaqui children. Working in the Apopka area, they initially conducted a screening of parents that led to a grouping of participants into four categories. One category included children whose parents had worked for five or less years in agriculture; the second category was children whose parents had six or more years of employment in farm work; the third group included children whose parents consumed fish and/or wildlife from in or around Lake Apopka; and the fourth group served as the control, with no known exposures. The high school students played similar games with the more than 30 children, ages 3-5, in the study. The age limits of the children involved in the project were decided in order to control for influences that attending school might have on behavior.

Their results were dramatic and clearly observable, and corroborated those of the study conducted by Dr. Guillette. Children of parents who were subject to the greatest risks of exposure to pesticides because of their length of time working in agriculture not only had slower response times to activities engaged in, but were less able, when asked to draw figures of family members, to make drawings resembling humans. The statistics demonstrated the disparities in the abilities of the children whose parents were subjected to the greatest exposures in their workplaces compared to those who had no known exposures.

Relevance to Lake Apopka. The results of Dr. Guillette's study and the students' science project raise some alarming questions with relevance to the Lake Apopka farmworker community. There is evidence to support the possibility that, not only are the former workers' experiencing health outcomes that could be related to past exposures to work place chemicals and pesticides, but their children and grandchildren, may also, in turn be feeling the affects. The emerging science links endocrine-disrupting chemicals to impacts on offspring. The difficulty of studying this phenomenon is partially due to the importance of the timing of the incidence of exposure in the development of the fetus. Critical times in fetal development are more vulnerable to toxic impacts than others. Certainly, there are sufficient questions posed to warrant a critical study on the health of the offspring of the former Lake Apopka farmworkers.

In Conclusion. The majority of the agricultural production operations on Lake Apopka ended in the summer of 1998. Since then, the SJRWMD has undertaken preliminary measures to begin the lake restoration efforts. A protected tract of land on the south shore of the lake has opened to the public as the Oakland Nature Preserve. Losing its rural character, the area surrounding Lake Apopka has recently experienced a wave of unprecedented growth and development. New communities are being constructed on tracts of land that once supported orange groves. A new highway was built connecting Highway 441 to the Florida Turnpike and other points to the west. Yet, amid all the progress, there remain disturbing and unanswered questions. What is the true legacy of

the years of farming on Lake Apopka? What are the impacts on the wildlife on the lake? What long-term effects have years of pesticide and agricultural chemical use had on the health of the lake and its people? How much of the current state of health of the former Lake Apopka farmworkers and their families can be attributed, in whole or in part, to their years of work on contaminated farm lands? These are questions that need to be asked, and a community's concerns that need to be addressed. Though the news and attention that put Lake Apopka in the headlines for years has quieted down, there remains buried in the rich muck soil, a story whose pages have yet to be opened.

The Lake Apopka Farmworkers Environmental Health Project is an attempt to open a dialogue on the community's health. After years of providing food to feed a nation, the people deserve no less.

APPENDIX B**Lake Apopka Farmworkers Environmental Health Project**

Hello Mr.or Ms. _____. My name is _____.

I've come today to try to understand how exposure to chemical pesticides and environmental contamination has affected our former farmworker community. This health survey is being conducted by the Farmworker Association of Florida. I wonder if you would agree to talk with me for about an hour? If you decide to help us, I will be happy to give you a food gift certificate to thank you for your time.

(If their answer is no, or if they are unsure, discontinue the interview.)

(If yes) Before we begin, I would like to hand you a copy and read our consent form. This form means that you have agreed to be interviewed and that your answers can be used as part of a public survey. Your name will be kept **absolutely confidential**.

I also want to tell you that you can change your mind about this interview at any time. For example, you could discontinue the interview today or call the farmworker's office in the future (the phone number is on the consent form) to discuss your questions or concerns with either staff member Ms. Geraldean Matthew or Sister Gail Grimes. Is that clear?

Good, now let's read the consent form. *(Read the consent form.)* If you agree, please sign on the bottom lines of each copy. You'll get to keep a copy and so will I.

Lake Apopka Farmworkers Environmental Health Project

Informed Consent Form

It is my job as an interviewer to listen to people in their homes as they talk about their experiences as farmworkers in the Lake Apopka area.

Thank you for participating in the **Lake Apopka Environmental Health Project**, which is conducted by the Farmworker Association of Florida. Our goal is to learn if there is any relationship between previous pesticide exposure of former farmworkers on the muck and around the lake, and people's current health conditions. Hopefully, this work will lead to a local health care system that is more knowledgeable about farmworker health problems.

If you decide to help out, the following will happen:

1. You will be asked to participate in a tape-recorded interview.
2. You may ask me any questions about the study or your part in it at any time.
3. Your name will not be on the survey in any place. I will, however, write and tape record your answers as part of a large survey whose results may be shown to the public. Remember, I won't use your name.
4. If you change your mind about this interview and say no, you can withdraw your consent and discontinue it at any time. Even if you change your mind later about the use of this interview, let us know by calling the Farmworker Association of Florida in Apopka at 407-886-5151 and asking for either staff member Ms. Geraldean Matthew or Sister Gail Grimes.

(Note: FWAF office makes 2 copies each of this sheet.)

Survey # _____

**Lake Apopka Farmworkers Environmental Health Project
Participant Consent and Signature**

I have reviewed the above information and have had it carefully explained to me. I understand the purpose of this study as well as my role as a participant. I hereby give my informed consent to take part in it . I understand that I will be given a copy of this form to keep.

Participant's name (print)

Date

Participant's signature

Street Address _____

P.O. Box _____

Phone _____

Interviewer's signature

Date

This is to show that I have received the gift certificate for my participation.

Participant's signature

Certificate #

Lake Apopka Farmworkers Environmental Health Project

Community Health Survey

1. Survey # _____

2. Age _____

3. Gender: a) Male _____ b) Female _____

4. Race/Ethnicity: a) African American (black) _____

b) Hispanic – b1) Mexican _____ b2) Mexican-American _____

b3) Puerto Rican _____ b4) Other _____

c) Haitian _____ d) White _____

5. How long have you lived in this house? _____

6. Who else lives in your house? *(please list)*

Name	Relation	Age
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. Before this house, did you live nearby? Y/N _____ Where? _____

How long? _____

8. When you worked on the farm around Lake Apopka, what kind of work did you do?

8A. What kind of crops did you work with?

9. How long did you do this farm work?

10. Are you working now? Y/N _____

11. *If yes*, what kind of work are you doing now? _____

Survey # _____

12. Do you smoke or chew tobacco? Y/N _____ What do you smoke or chew?

Did you used to smoke or chew tobacco? Y/N _____ What did you used to smoke or chew? _____

What are the total number of years you have been smoking? _____

What are the total number of years you have been chewing? _____

13. Do you drink liquor, beer, or wine? Y/N _____ What do you mostly drink?

Did you used to drink liquor, beer or wine? Y/N _____

What did you used to drink? _____

What are the total number of years that you have been drinking? _____

Interviewer use a check mark

14. When you need medical attention, where do you go?

- a) local clinic _____
- b) private doctor _____
- c) hospital emergency room _____
- d) urgent care center _____
- e) company nurse _____
- f) local healer _____ who would that be and what is their title? _____
- g) take care of it at home _____
- h) other _____

15. How often do you get medical attention?

- a) at least once a month _____
- b) every three months _____
- c) every six months _____
- d) once a year checkup _____
- e) only go when I don't feel well _____
- f) don't go to the doctor _____

15A. If you live with a child or children, spouse, parent, or friend or friends:

When they need medical attention, where do they go?

- a) local clinic _____
- b) private doctor _____
- c) hospital emergency room _____
- d) urgent care center _____
- e) company nurse _____
- f) local healer _____ who would that be and what is their title? _____
- g) take care of it at home _____
- h) other _____

16. Do you get preventive checkups like:

- a) mammograms? (women) _____
- b) PAP smears? (women) _____
- c) blood pressure check ups? _____
- d) cholesterol checks? _____
- e) prostate exams? (men) _____

17. Do you think you are getting good health care from whomever you see?

Y/N _____

17A. If not, why not? _____

17B. Do you have to travel long distances for healthcare? Y/N _____

If yes, how far do you travel? _____

18. Do you feel that you are in:

- a) excellent health? _____
- b) good health? _____
- c) fair health? _____
- d) poor health? _____

19. Why are you in (either excellent, good, fair, or poor) health? _____

20. When you were doing farm work, did you bring home pesticide containers?

Y/N _____

20A. *If yes, what did you use them for?*

a) to hold drinking water _____

b) to hold laundry detergent _____

c) as a trash can _____

d) as a place to keep clothing or children's clothing, like underwear, socks, or other clothing? _____

if yes, what types of clothing? _____

e) as a place to store food like sugar, flour, or other food? _____

if yes, what types of food? _____

g) other use _____

21. Do you or anyone in your household suffer from any of the following conditions?

a) allergies _____ *if yes, who?* _____

b) frequent sinus problems _____ *if yes, who?* _____

c) throat problems like coughing _____ *if yes, who?* _____

d) ear aches or ear infections _____ *if yes, who?* _____

e) frequent infections _____ *if yes, who?* _____

f) skin problems, recurrent rashes _____ *if yes, who?* _____

22. Do you or anyone in your household suffer from:

a) a lot of coughing? _____ *if yes, who?* _____

b) spitting up blood? _____ *if yes, who?* _____

22A. *If yes, is there a pan by the bed for spitting?* Y/N _____

If yes, what's that experience like? _____

Survey # _____

23. Do any of your farmworker relatives or friends outside of your household have these same health problems?

- a) a lot of coughing _____ *if yes, who?* _____
- b) spitting up blood _____ *if yes, who?* _____

23A. Do they have a pan by their bed for spitting? Y/N _____

23B. Do they have any other health problems? Y/N _____ *If yes, what are they?*

23C. Could you refer them to us to participate in the survey?

(Interviewer make sure the referred person worked on Lake Apopka farms.)

24. Do you or anyone in your household have problems with:

- a) skin? _____ *if yes, who and what problem?* _____
- b) finger nails? _____ *if yes, who and what problem?* _____
- c) toe nails? _____ *if yes, who and what problem?* _____
- d) hair? _____ *if yes, who and what problem?* _____
- e) has or had skin cancer? _____ *if yes, who and what problem?* _____

25. Do you or anyone in your household suffer from:

- a) asthma? _____ *if yes, who?* _____
- b) emphysema? _____ *if yes, who?* _____

26. Do you or anyone in your household get frequent infections? Y/N _____

If yes, who? _____ *If yes, what kind of infections?* _____

27. Do you or anyone in your household have, or ever had cancer? Y/N _____

If yes, who? _____ *If yes, what kind of cancer?* _____

28. Do you or anyone in your household have urinary problems?

- a) having to go to the bathroom a lot _____ *if yes, who?* _____
- b) urinary tract or bladder infections _____ *if yes, who?* _____
- c) urinary urgency at night _____ *if yes, who?* _____

29. Is anyone in the household overweight? Y/N _____ *If yes, who?* _____

29A. Do they have any health problems related to their weight? Y/N _____ *If yes,*
what is/are the problem(s)? _____

29B. Is anyone in the household underweight? Y/N _____ *If yes, who?* _____

29C. Do they have any health problems related to their weight? Y/N _____ *If yes,*
what is/are the problem(s)? _____

30. Do you have children? Y/N _____

- a) *If yes, how many?* _____
- b) How many of your children have a learning disability? _____
- c) What is the learning disability? _____
- d) How do you know they have this disability or disabilities? _____

31. Do you have grandchildren? Y/N _____

- a) *If yes, how many?* _____
- b) How many of your grandchildren have a learning disability? _____
- c) What is the learning disability? _____
- d) How do you know they have this disability or disabilities? _____

32. Do you or anyone in your household suffer from any of the following conditions?

- a) sadness a lot _____ *if yes, who?* _____
- b) nervous for no apparent reason _____ *if yes, who?* _____
- c) uncontrollable anger _____ *if yes, who?* _____
- d) loss of memory _____ *if yes, who?* _____

33. Do you or anyone in your household suffer from:

- a) arthritis? _____ *if yes, who?* _____
- b) rheumatism? _____ *if yes, who?* _____

34. Was anybody in the family born with a birth defect? Y/N _____

- a) cleft palate _____ *if yes, who?* _____
- b) cleft lip _____ *if yes, who?* _____
- c) different shaped hands or fingers _____ *if yes, who?* _____
- d) different shaped feet or toes _____ *if yes, who?* _____
- e) other _____ *if yes, who?* _____

34A. Was there any reason given by the doctor for this birth defect(s)? Y/N _____

34B. If yes, what was the reason? _____

35. Do you or anyone in your household have digestion problems like:

- a) frequent nausea? _____ *if yes, who?* _____
- b) frequent vomiting? _____ *if yes, who?* _____
- c) stomach pain? _____ *if yes, who?* _____
- d) liver disease? _____ *if yes, who?* _____
- e) acid reflux? _____ *if yes, who?* _____
- f) other? _____ *if yes, who?* _____

36. Do you or anyone in your household have bowel problems like:

- a) diarrhea? _____ *if yes, who?* _____
- b) constipation? _____ *if yes, who?* _____
- c) change in bowel movements? _____ *if yes, who?* _____
- d) blood in the stool? _____ *if yes, who?* _____
- e) other? _____ *if yes, who?* _____

37. Did you and your partner have reproductive problems? Y/N _____

If yes:

- a) couldn't conceive _____
- b) a problem of sterility _____
- c) a problem of infertility _____
- d) other _____ (please explain) _____

37A. Was any reason given by the doctor to explain the reproductive problems?

Y/N _____ *If yes, explain* _____

38. Did you (or your partner) experience one or more problem pregnancies?

Y/N _____

If yes:

- a) complicated pregnancy _____ how many? _____ explain _____
- b) child died at childbirth _____ how many? _____ explain _____
- c) child died shortly after birth _____ how many? _____ explain _____
- d) miscarriage _____ how many? _____ explain _____
- e) other type of problem(s)? _____ explain _____

38A. Was any reason given by the doctor to explain the difficult pregnancy?

Y/N _____ *If yes, explain* _____

39. Do you or anyone in your household have problems with their blood like:

a) extreme tiredness? _____ *if yes, who?* _____

b) leukemia? _____ *if yes, who?* _____

c) sickle cell? _____ *if yes, who?* _____

d) other? _____ *if yes, explain* _____

40. Do you or anyone in the household often have swollen glands? Y/N _____

If yes, who? _____

41. Do you or anyone in the household have diabetes? Y/N _____ *If yes, who?*

42. Do you or anyone in the household have:

a) a thyroid problem (either too fast or too slow)? _____ *if yes, who?* _____

b) a goiter or an unusual growth? _____ *if yes, who?* _____

43. Do you or anyone in your family suffer from lupus? Y/N _____

If yes, who? _____

44. Were you exposed to pesticides or chemicals where you worked?

Y/N _____ Not sure _____

44A. In what way(s) were you exposed to pesticides or chemicals in the workplace?

Interviewer: read entire list, check all that apply.

- a) Being sprayed by an airplane or drift from its spray _____
- b) Entered an area after not being informed it was sprayed _____
- c) Touched plants that were wet, or worked in the fields where plants were wet from pesticides, morning dew or rain _____
- d) Through hands/skin lacerations _____
- e) By not washing hands _____
- f) When planting, potting or replanting _____
- g) Through smell, breathing in, poor indoor ventilation _____
- h) Washing/cleaning plants/ trees/ crops _____
- i) Unpacking plants or cuttings _____
- j) Pesticides drift into where you live _____
- k) Other _____
- l) Don't know _____

44B. Do you know what pesticides you were exposed to? Y/N _____ *If yes, what was the name(s)?* _____

45. Do you feel that your exposures to pesticides have affected your health?

Y/N _____ Not sure _____

45A. If yes, do you feel these exposures are directly related to your current health problems? Y/N _____ *If yes, please explain* _____

Survey # _____

46. When you were exposed to pesticide chemicals, did you seek medical attention?

Y/N _____

46A. If yes, where did you go?

- a) local clinic _____
- b) private doctor _____
- c) hospital emergency room _____
- d) urgent care center _____
- e) company nurse _____
- f) local healer _____ who would that be and what is their title? _____
- g) took care of it at home _____
- h) other _____

47. (Only if they sought medical attention) What did the doctor or health care provider tell you to do? _____

48. (Only if they sought medical attention) Did that advice help you? _____

49. Did the doctor or health care provider ever diagnose you with pesticide poisoning?

Y/N _____ Not sure _____

49A. If yes, do you have a copy of that diagnosis? Y/N _____

(Note: We don't need to see it now.)

50. At the job, did you consistently wear any of the following protective gear or clothing:

Interviewer: read entire list, check all that apply.

- a) gloves? _____
- b) clothing apron? _____
- c) long pants? _____
- d) long sleeved shirt? _____
- e) a mask? _____
- f) a hat? _____
- g) safety glasses? _____
- h) other? what did you wear? _____

51. Do you take a doctor's prescription medicine for:

Interviewer: read entire list, check all that apply.

- a) blood pressure? _____ *if yes, high?* _____ *or low?* _____
- b) cholesterol? _____
- c) allergies? _____
- d) chronic cough? _____
- e) skin rash? _____
- f) urinary infections? _____
- g) bowel problems like diarrhea or constipation? _____
- h) extended sadness or depression? _____
- i) being nervous? _____
- j) arthritis? _____
- k) rheumatism? _____
- l) diabetes? _____
- m) thyroid? _____ *if yes, too fast?* _____ *or too slow?* _____
- n) lupus? _____
- o) other? _____

Survey # _____

51A. Are you taking prescription medicine for anything else? Y/N _____ *If yes, for what condition?* _____

52. Do you often use over-the-counter drugstore medicine(s) like:

- a) cough drops? _____
- b) cough syrup? _____
- c) aspirin? _____ Tylenol? _____ Advil? _____ another pain reliever? _____
- d) eye drops? _____
- e) skin cream for rashes? _____
- f) other? _____ *if yes, what do you use?* _____

53. Do you use treatments or remedies that you make at home? Y/N _____ *If yes, what do you use?* _____ *What does it help?* _____

54. Do you eat any of the following varieties that are caught in the waterways of Lake Apopka?

- a) fish _____
- b) turtle _____
- c) raccoons _____
- d) rabbits _____
- e) alligators _____
- f) wild vegetables _____

54A. *If yes, how often do you eat these varieties caught in the waterways of Lake Apopka?*

- a) once a week _____
- b) twice a week _____
- c) three or more times a week _____
- d) once a month _____
- e) twice a month _____
- f) year round _____

Survey # _____

54B. Did you used to eat any of the following varieties that are caught in the waterways of Lake Apopka?

- a) fish _____
- b) turtle _____
- c) raccoons _____
- d) rabbits _____
- e) alligators _____
- f) wild vegetables _____

54C. How often did you used to eat these varieties caught in the waterways of Lake Apopka?

- a) once a week _____
- b) twice a week _____
- c) three or more times a week _____
- d) once a month _____
- e) twice a month _____
- f) year round _____

55. Is there anything else you would like to tell me about your work experiences, your health or your family's health? Y/N _____ *If yes, explain* _____

56. Is your house near any of the following?

- a) an industrial landfill _____ Don't Know _____
- b) a Superfund site _____ Don't Know _____
- c) a medical incinerator _____ Don't Know _____

57. Where does your home drinking water come from?

- a) the city or town _____
- b) a well _____
- c) Not Sure _____

Thank you very much for participating in
the Lake Apopka Farmworkers Environmental Health Project.
We really appreciate your time and your help.

APPENDIX C

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