

Recruitment and Enrollment of Rural Non-Farming Iowa Households for the Evaluation of Agrichemical Exposures

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Introduction

In 2007, over 300 million acres were treated with chemicals for the control of weeds and insects in the United States. In Iowa alone, 20 million acres were treated with herbicides and nearly 8 million acres were treated with insecticides. The widespread use of pesticides is cause for concern due to the potential impact on human health and the environment. Environmental pesticide exposures may be influenced by seasonality and residential proximity to farm fields.

Objective

The goal of this pilot study was to recruit and enroll a sample of 30 Iowa households who are representative of a rural non-farming target population.

Target:

- 10 households per county
- 3 counties (H, M, L total acres treated)

Methods

Subject Recruitment

University of Iowa's Institutional Review Board approval (Sept. 2010)

Randomized contact list generated

- Infogroup, Inc.
- Original List: +1200 households
 - Addresses outside of town were eliminated
 - Eliminated households with <2 adults
 - Excluded commercial pesticide applicators
- Invited to Participate: 430 households (Nov. 2010 – Jan. 2011)
 - Represented 32 towns in 3 target counties
 - Sent SASE with screening questionnaire
 - Non-responders contacted by phone
- Reviewed and selected for enrollment
 - Eligibility determined from self-administered screening questionnaire

Subject Enrollment

In-home visits scheduled by phone (Feb. – Mar. 2011)

- Minors aged 15-17 and all adults eligible for participation

Site Visit

- Administered study questionnaire
- Baseline demographics and home environment information
- Collected water sample
 - Primary source for drinking/cooking (0.5-0.75 L)
- Collected urine samples for each participant in each household
 - Day of enrollment, next day (30-90 mL sample)

Subject Evaluation

Evaluated enrollee demographics (gender, race, age, SOC)

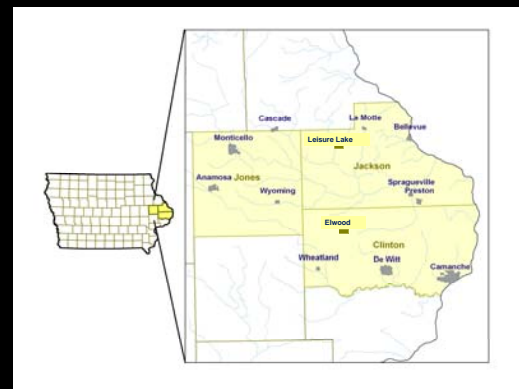
Compared to 2000 census to ensure adequate representation of the county

Initial Response Rate: 41 of 430 households (9.5%)

Phase 1 Study Enrollment: 33 households

- 63 total participants enrolled
- 13 total communities in 3 Iowa counties (Figure 1)
- All communities with populations of 5000 or less
- Oversampled by 3 additional households from targeted goal of 30

Figure 1. Eastern Iowa communities across 3 counties.



Results

Study Population Water Supply

- Municipal water systems: 25
- Private well: 8

Table 1. Demographics by Iowa county.

	Clinton	Jones	Jackson
Median Age (range)	41 (23-58)	42 (27-50)	42 (27-54)
2000 Census, median	38	38	50
Gender			
Female, n (%)	11 (51%)	11 (50%)	10 (50%)
Male, n (%)	10 (49%)	11 (50%)	10 (50%)
2000 Census, % Male	49%	52%	50%
Race			
White	19	22	20
Nonwhite	2	0	0
2000 Census, % White	96%	97%	99%
Standard Occupational Classification Code (SOC)*			
13- business/finance	3	0	3
15- computer/math	0	1	0
19- physical sciences	0	1	2
25- education/library	3	2	4
29- health care/nursing	1	6	3
33- protective services	3	1	0
35- food prep/services	2	0	0
43- administrative	2	3	1
47- construction	1	3	2
51- production	1	1	3
53- transportation	3	0	1
Self-employed	0	2	0
Unemployed	2	1	1
Student	0	1	0

*US Department of Commerce, *Standard Occupational Classification Manual*. Latham, MD: Bernan Press; 2000.

Conclusions

Low response to study invitation (9.5%)

Demographic information similar to baseline demographic characteristics (by county) from 2000 census data

Well-characterized contact list was an efficient recruitment tool

Characterized study population for factors to study pesticide burden in non-farming households

- Water source information
 - Municipal- vs. private well-supplied
 - In-home water treatment/filtration systems
- Qualitative pesticide exposure factors
 - Home pesticide applications
 - Pets, age of home, water consumption rate
- Proximity to farm fields

Future Work

Analyze Phase 1 Data:

- Analyze water and urine samples for pesticides
- Evaluate relationship between urinary metabolites and county land application rates to develop an exposure surrogate

Phase 2:

Follow-up with study population after community's pesticide application

- June/July 2011
- Short questionnaire
- Additional water, urine collection
- Evaluate relationship between urinary metabolites and county land application rates to develop an exposure surrogate, with pre- and post- application data

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