

# **Reproductive Health Assessment after Disaster (RHAD) in Four Illinois Counties**

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## Table of Contents

Introduction.....	1
Executive Summary.....	3
Section 1. Background Characteristics.....	4
Sociodemographic Characteristics.....	6
Amount of Damage to Home.....	7
Number of Moves.....	7
Current Residency.....	10
Residence Type.....	10
Number of Household Members.....	10
Section 2. Pregnant Women.....	10
Current Pregnancy.....	10
Initiation of Prenatal Care.....	10
Barriers to Prenatal Care.....	11
Access to Prenatal Care.....	11
Section 3. Postpartum Women and Infants.....	11
Infant Weight at Birth.....	11
Premature Birth and Low Birth Weight.....	11
Well Baby Care.....	11
Barriers to Baby Care.....	11
Barriers to Infant Feeding.....	11
Section 4. Family Planning.....	12
Difficulties Getting Birth Control.....	12
Section 5. Family Stressors, Risk Behaviors and Needs.....	12

Disaster Exposures...	12
Caregiving Role.....	16
Food Security.....	16
Safety Perceptions.....	16
Tobacco and Alcohol Use.....	17
Recent Sexual History.....	19
Perception of Risk for HIV and STI.....	19
Social Service Needs.....	19
Preferred Method of Receiving Health Information in a Future Disaster.....	22

## **Introduction**

The Reproductive Health Assessment After Disasters (RHAD) toolkit was developed to assess the reproductive health needs among women aged 15 – 44 years who have been affected by natural and/or man-made disasters. RHAD is part of an initiative by the U.S. Centers for Disease Control and Prevention (CDC), Division of Reproductive Health for use by local and state health departments or other organizations that provide reproductive health services to U.S. disaster-affected women. A modified RHAD survey was implemented to assess the reproductive health risks and psychosocial effects of the November 17, 2013 tornado from women residing in four central Illinois counties. Data collection was conducted by teams of trained volunteers of student nurses, alumni, faculty, and staff from Graham Hospital School of Nursing and Illinois Wesleyan University. The sample population was derived by superimposing National Weather Service (NWS) field reports and U.S. Census data. If a community's population was greater than 900, a two-stage cluster sampling method, adapted from CDC's Community Assessment for Public Health Emergency Response (CASPER), with referral, was used to locate eligible women. Tapping into self-organized social media accounts facilitated outreach to women eligible to participate who were relocated from the targeted blocks selected in the first or second stage of sampling. Extensive outreach efforts were employed to obtain questionnaires and locate displaced families who were eligible to participate. A major strength of the study is that 37% of the sample is comprised from women who were relocated as a result of the tornado. Respondents were given a gift card to Walmart for their participation in the study.

The report covers a variety of selected topics broken down into specific sections: background characteristics, pregnant women, postpartum women and infants, family planning, and family stressors, risk behaviors, and needs. Data collected during the post-disaster recovery phase are presented in the body of the report. Findings can be integrated into Public Health Emergency Preparedness and Response initiatives and ultimately used to develop evidence based services to improve the health of disaster-affected women and their families.

## Executive Summary

- On average, families whose home sustained major damage and was not livable moved once; families with destroyed homes moved twice.
- Almost all (98.5%) reported living in a house, condo or apartment.
- All pregnant women are receiving prenatal care and reported no barriers in accessing care.
- 90% of postpartum women had a checkup and reported no barriers in accessing care.
- All infants had been seen by a doctor since birth.
- Pharmacies should extend hours to facilitate filling of prescriptions in the immediate phase following a tornado.
- A majority of the families experienced multiple disaster exposures.
- Food insecurity affects 6.7% of women and their families.
- Perceptions of feeling unsafe in their homes and vulnerable have increased dramatically across all categories.
- Counseling was the most requested unmet social service need.
- The preferred method for receiving health information in a future disaster is the internet.

## Section 1: Background Characteristics:

Four counties were declared federal disaster areas and eligible for FEMA individual assistance. Tazewell County had the largest population, sustained the heaviest damage, and included the cities of Pekin and Washington. Woodford County was impacted primarily in isolated rural areas, and included the towns of Roanoke and Minonk. Gifford, Illinois (population 975 with 300 housing units) sustained the majority of damage in Champaign County. Some rural areas adjacent to Gifford are in Vermilion County but we were unable to find any women who met the eligibility criteria. Westville, Illinois in Vermilion County also sustained damage primarily in a trailer park. Residents living in the trailer park refused to participate and most of the trailers were abandoned or boarded up. The trailer park contained primarily old trailers in disrepair and it was hard to ascertain if the conditions were recent or related to an aging abandoned structure. Surrounding areas had isolated minimal damage and interviewers were unable to locate any eligible women. Thus, the sample does not contain any women from Vermilion County.

Site	Frequency	Percent
Champaign County	17	12.6%
Tazewell County	101	74.8%
Woodford County	17	12.6%
Total	135	100%

Inclusion criteria approved by the Institutional Review Board were women aged 18-44 years. Sample mean age was 34.4 years with a median age of 35 years. The sample

population was predominately non-Hispanic, white, highly educated and married. These demographics reflect the rural central Illinois population from which they were sampled.

## Sociodemographic Characteristics

	Percent	95% C.I.*
<b>Ethnicity</b>		
Hispanic	5.2	(2.1-10.4)
Non-Hispanic	94.85	(89.6-97.9)
<b>Race</b>		
White	97.8	(93.6-99.4)
Black	---	-----
Asian	0.7	(0.0-4.1)
American Indian/ Alaska native	0.7	(0.0-4.1)
Other	0.7	(0.0-4.1)
<b>Education</b>		
Grades 9-11	1.5	(0.2-5.3)
Grade 12 or GED	18.5	(12.4-26.1)
College 1-3 years	31.1	(23.4-39.6)
College 4 years or more	34.1	(26.1-42.7)
Graduate degree	14.8	(9.3-22.0)
<b>Marital Status</b>		
Married	70.4	(61.9-77.9)
Divorced	10.4	(5.8-16.8)
Separated	1.5	(0.2-5.3)
Never married	12.6	(7.5-19.4)
Member of unmarried couple	5.2	(2.1-10.4)

\*Confidence Interval

### Amount of Damage to Home

Respondents were asked to categorize the amount of damage to their homes. Damage estimates range from no damage (23%) to completely destroyed (13.3%). A major strength of the study is that 37% of the sample is comprised from women who were relocated. Extensive outreach efforts were employed to obtain questionnaires and locate displaced families who were eligible to participate.

	Frequency (n)	Prevalence (%)	95% C.I.*
No damage	31	23.0	(19.2-31.0)
Minor, still livable	54	40.0	(31.7-48.8)
Major, not livable	32	23.7	(16.8-31.8)
Destroyed	18	13.3	(8.1-20.3)

\*Confidence Interval

### Number of Moves

Women were asked how many times they have moved since the tornado. Damage of the home was cross tabulated with the number of moves. Slightly over half (52.6%) did not need to move out of their home. A few did report moving although there was no damage to the home. One explanation might be due to no electricity for an extended period of time. Of the 27% who moved once, most had major damage to their homes.

61% of women whose home was destroyed reported moving twice. Three women reported not moving despite having a house that was not livable. Data collection teams found families living in the basements of homes boarded up in abandoned neighborhoods that chose not to relocate. These data suggest that relocation efforts were successful and usually required only one move.

	Number of Moves						
How damaged was your home by the tornado? Read All - Choose only one response	0	1	2	3	4	5	Total
<b>No damage</b>	27	2	1	0	0	1	31
Row%	87.10%	6.45%	3.23%	0.00%	0.00%	3.23%	100.00%
Col%	38.03%	5.41%	4.76%	0.00%	0.00%	100.00%	22.96%
<b>Minor, still livable</b>	41	9	4	0	0	0	54
Row%	75.93%	16.67%	7.41%	0.00%	0.00%	0.00%	100.00%
Col%	57.75%	24.32%	19.05%	0.00%	0.00%	0.00%	40.00%
<b>Major, not livable</b>	3	21	5	2	1	0	32
Row%	9.38%	65.63%	15.63%	6.25%	3.13%	0.00%	100.00%
Col%	4.23%	56.76%	23.81%	50.00%	100.00%	0.00%	23.70%
<b>Destroyed</b>	0	5	11	2	0	0	18
Row%	0.00%	27.78%	61.11%	11.11%	0.00%	0.00%	100.00%
Col%	0.00%	13.51%	52.38%	50.00%	0.00%	0.00%	13.33%
<b>TOTAL</b>	71	37	21	4	1	1	135
Row%	52.59%	27.41%	15.56%	2.96%	0.74%	0.74%	100.00%
Col%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

## Current Residency

Phone referrals were asked in what county and state they currently reside. The majority reported living in Tazewell County (62.5%), Woodford County (21.9%) and Peoria County (9.4%).

County of Residence	Frequency	Percent	95% C.I.*
Champaign	2	6.2	(.20-16.2)
Peoria County	3	9.4	(2.0-25.0)
Tazewell County	20	62.5	(43.7-78.9)
Woodford County	7	21.9	(9.3-40.0)

\*Confidence Interval

## Residence Type

Almost all (98.5%) reported living in a house, condo or apartment. Only 1.5% reported staying with friends or family. None sampled were in shelters, FEMA trailers, hotels or homeless.

## Number of Household Members

Approximately 13% of households reported having a baby less than one year. Almost 74% of households reported having 1-3 children or teenagers. Three-quarters of the sample have two adults living in the household. Only 4.4% of the households reported any older adults aged 65 and above residing in the household.

## Section 2: Pregnant Women

Amongst the respondents, 3.7% (n=5) reported they were pregnant; two in the first trimester and three in the second trimester. All are receiving prenatal care. Four began receiving prenatal care in the first trimester; one began care at sixteen weeks but

reported no difficulties in getting an appointment. On a positive note, none of the women reported not being able to access care as early as they wanted nor found it more difficult to schedule prenatal care because of the tornado. One potential explanation is that access to care was influenced by the close proximity to a major metropolitan city with multiple hospitals and extensive medical facilities. In addition, the demographic data suggest that many women were adequately resourced when using educational status as a proxy for income.

### **Section 3: Postpartum Women and Infants**

Ten women (7.4%) of the sample had given birth in the previous six months. Five women reported they were pregnant when the tornado occurred. One birth was premature and had a low birth weight related to being a multiple gestation (twins) however, the birth occurred prior to the tornado. All other birth weights were within normal range. Of the ten births, only one woman reported not having a postpartum checkup because it was difficult getting an appointment because of the tornado. No additional barriers posed a problem to the respondents.

All infants had a checkup with a doctor since they were born. Only one woman indicated a problem with getting an appointment for her infant because she had moved to a different county after the tornado. No other barriers to getting care were reported.

Women were asked if they had difficulties with infant feeding because of the tornado.

One woman reported difficulty in getting formula and another woman reported difficulty in breastfeeding twins.

## **Section 4: Family Planning**

Only one woman (0.7%) reported it has been more difficult to get her birth control method since the tornado. No reason was given why it was harder than previously. It was suggested for pharmacies to stay open later into the evenings after a disaster. Some reported difficulty obtaining medications because of meetings with insurance agencies, FEMA, and social service agencies throughout the daytime and pharmacies being closed before they could get there.

## **Section 5: Family Stressors, Risk Behaviors and Needs**

### **Disaster Exposures**

The impact of the tornado resulted in many disaster exposures creating multiple stressors for the families. Approximately 60% of respondents reported feeling like their life was in danger when the tornado struck. One respondent reported that her husband had just driven away from their home, prior to the siren warning. She moved her two older children to the bathroom, one of whom was autistic, got them into the bathtub and realized she couldn't cover both of them using her body for protection and had to make an immediate decision as to which child to shield. 12% of respondents and household members had an illness or injury as a result of the tornado. A large majority (69.6%) walked through floodwater or debris following the tornado and more than half (56.3%) of the respondents were without electricity for more than one week. Although Woodford County residents reported less property damage than Tazewell County, some households reported being without electricity for more than three weeks. Lack of electricity during the last weeks of November and early December was a formidable problem especially with the reported cold temperatures and early snow. Lack of

electricity required many families to seek temporary shelter because their homes were not livable even though structural damage may have been minimal. Respondents found this question difficult to answer since those who lost electricity relocated to temporary housing with electricity.

Two deaths occurred as a result of the tornado. The death toll probably would have been much higher but respondents reported they were not at home (attending church) when the storm occurred on a Sunday morning, which removed many from a direct exposure to an E4 tornado. While churches sustained minimal damage, over 1,000 homes were destroyed. Despite the low death rate, 3.7% had someone close to them die in the tornado and 1.5% saw someone die.

Over one-third of respondents reported living in temporary housing or conditions that they were unaccustomed to before the tornado. Despite the need to find temporary housing, many respondents expressed gratitude to be alive. Over half of the sample lost personal belongings and 20% were separated from loved ones. One problem that arose was the need for an emergency plan for pets. Because shelters do not allow pets it was suggested disaster mitigation planning consider provisions for temporary care of pets following a disaster. Families reported that separation from pets was an additional source of stress. (Note: this was not an item on the questionnaire).

Over 22% of respondents experienced difficulty getting services or aid from the government or insurance companies. Despite few reported losing their job or their

spouse losing a job as a result of the tornado, 17% reported insufficient money to pay bills.

The cumulative toll of these stressors was reflected in 19% reporting increased arguments with their husband or partner. Prevalence estimates for arguments may be underestimated because six additional women either did not respond or indicated didn't know. Three women reported getting in a physical fight but none reported jail time. One woman reported having someone close to them with a drinking or drug problem.

## Disaster Exposures

	Yes (n)	Prevalence % 95% C.I.*	No (n)	Prevalence % 95% C.I.*	Don't know/No response (n)
Felt like your life was in danger	80	59.3 (50.5, 67.6)	54	40.0 (31.7, 48.8)	1
Had an illness or injury	16	11.9 (6.9, 18.5)	119	119 (81.5, 93.1)	
Household member had illness/injury	15	11.2 (6.4, 17.8)	119	88.8 (82.2, 93.6)	
Walked through floodwater or debris	94	69.6 (61.1, 77.2)	41	30.4 (22.8, 38.9)	
Without electricity for >1 wk	76	56.3 (47.5, 64.8)	57	42.2 (33.8, 51.0)	2
Someone close died in the tornado	5	3.7 (1.2, 8.4)	130	96.3 (91.6, 98.8)	
You saw someone die in the tornado	2	1.5 (0.2, 5.3)	133	98.5 (94.8, 99.8)	
Living in temporary housing/conditions not accustomed to	46	34.1 (26.1, 42.7)	89	65.9 (57.3, 73.9)	
Lost personal belongings	68	50.4 (41.6, 59.1)	67	49.6 (40.9, 58.4)	
Separated from loved ones	28	20.7 (14.3, 28.6)	107	79.3 (71.4, 85.8)	
Difficulty getting services/aid from govt. or insurance	30	22.2 (15.5, 30.2)	105	77.8 (69.8, 84.5)	
Husband/partner lost job	1	0.7 (0.0, 4.1)	131	97.0 (92.6, 99.2)	3
Lost your job	4	3.0 (0.8, 7.4)	130	96.3 (91.6, 98.8)	1
Argued with husband/partner more	25	18.5 (12.4, 26.1)	104	77.0 (69.0, 83.8)	6
Bills you couldn't pay	23	17.0 (11.1, 24.5)	112	83.0 (75.5, 88.9)	
In a physical fight	3	2.2 (0.5, 6.4)	132	97.8 (93.6, 99.5)	
You or husband or partner went to jail	0		135	100	
Someone close had problem with drinking/drugs	1	0.7 (0.0, 4.1)	134	99.3 (95.9, 100.0)	

## **Caregiving Role**

On average, women provided care on a regular basis to 2.61 persons prior to the tornado. After the tornado, the average raised slightly to 2.63 persons. No clear pattern in the data was noted and overall little change in caregiving duties occurred. After the tornado, six women reported caring for fewer household members and seven women reported an increase in the number of people they provided care for on a regular basis.

## **Food Security**

Prior to the tornado, approximately 5.3% (n=7) reported eating less because of insufficient money to buy food. Food insecurity increased after the tornado for an additional four families. After the tornado, 6.7% (n=9) women reported eating less because of insufficient money to buy food. Five women reported no change in status having insufficient food before and after the tornado. Of note, two women who experienced food insecurity prior to the tornado reported an improvement and reported adequate food resources after the tornado.

## **Safety Perceptions**

Perceptions of feeling safe decreased dramatically from pre-tornado levels. Approximately 89% (n=120) of the respondents indicated never feeling unsafe in their residence prior to the tornado. Subsequently, 52.5% never felt unsafe, 17% rarely felt unsafe, 21% sometimes felt unsafe, 9% often felt unsafe and 1% always felt unsafe amongst the same respondents (data not shown). Before the tornado, three respondents reported sometimes feeling unsafe; now thirty people or 22% of the sample sometimes feel unsafe. None of the sample rated often feeling unsafe whereas following the tornado 10% do. Women described hearing loose house siding flapping in

the wind in the abandoned neighborhood at night creating an eerie feeling. Looters combing the neighborhoods also left residents feeling vulnerable. One woman described police cars that would slowly cruise the streets at night without their lights on watching for looters. We found several heavily damaged homes in abandoned neighborhoods that were occupied. The residents expressed they chose to stay so they moved into the basement.

	<b>How often did you feel unsafe in the place where you lived just before the tornado? (n)</b>	<b>Prevalence %</b>	<b>How often have you felt unsafe in the place where you live since the tornado? (n)</b>	<b>Prevalence %</b>
<b>Never</b>	120	88.9	64	47.4
<b>Rarely</b>	10	7.4	26	19.3
<b>Sometimes</b>	3	2.2	30	22.2
<b>Often</b>	0		14	10.4
<b>Always</b>	2	1.5	1	0.7

### **Tobacco and Alcohol Use**

Prevalence estimates of tobacco product use to include snuff, chewing tobacco, cigars, pipe or cigarettes since the tornado was 23.0% (n=31). Because the survey didn't include information regarding usage prior to the tornado, change in usage patterns couldn't be calculated. In contrast, the Illinois Prams Report 2009 reported a tobacco prevalence estimate of 14.6% among women prior to pregnancy. These data suggest

the rate of tobacco use among tornado respondents is substantially higher than the state average. Although Prams data were based on state estimates collected in a different year and sample data demographics vary significantly from Illinois' general population; these estimates are the closest comparison data available to help interpret our estimates.

Prevalence rates of alcohol consumption after the tornado are shown below. Previous consumption pattern data were not collected precluding calculation of change estimates. To better interpret the prevalence estimates of self-reported alcohol consumption in this study, Illinois Prams Report 2009 data were used to base comparisons. Overall, significantly fewer women reported drinking less than one drink a week in contrast to estimates reported in the Illinois' Prams report (28.2% and 53.0%, respectively). Consuming one to three drinks in a week closely approximated the reported Prams estimates (31.1% and 30.5%, respectively). Consuming four or more drinks during a week was lower in the sample than state Prams data (11.6% and 16.5%, respectively).

<b>Alcohol</b>	<b>Frequency</b>	<b>Prevalence %</b>
----------------	------------------	---------------------

≥ 14 drinks week	1	0.7
7-13 drinks week	3	2.2
4-6 drinks week	12	8.9
1-3 drinks week	42	31.1
<1 drink a week	38	28.2
No alcohol since storm	37	27.4
Don't know	1	0.7
No response	1	0.7
Total	135	100.00

**Recent Sexual History, Perception of Risk for HIV and Sexually Transmitted Infections**

Three questions formed the basis for the estimates. Because of the highly personal nature of the questions, it is possible our prevalence rates are underestimated. Two women (1.5%) responded that they had sex with more than one person since the tornado. Neither felt they were at risk for a sexually transmitted infection. Only one woman responded that she perceived risk for HIV or a sexually transmitted infection because she takes care of foster children.

**Social Service Needs**

Family stressors and social service needs were assessed by asking, “Do you feel you currently need any of the following services?” Counseling was the most requested need by respondents. Due to the sensitive nature of the question, it is likely that the 15% who responded affirmatively could be an underestimation. One respondent shared she had

been diagnosed with Post Traumatic Stress Disorder and was seeking information on treatments. Another woman indicated that she wanted counseling but was a single parent and unable to pay for it. She wondered if some of the funding the City of Washington received following the tornado could be allocated for counseling for those unable to afford mental health services. It was also stated that some of the children were having a difficult time coping during thunderstorms where they would cling to their mothers and display regressive behaviors such as thumb sucking. On a positive note, assistance with housing was not identified as a need for most of the population and suggests initial relocation initiatives were successful. None of the sample indicated a need for help with an alcohol or drug problem. It is possible it is an underestimation due to the sensitive nature of the question; however the data corroborates low alcohol consumption patterns reported in another question. Similarly, 2.22% (n=3) indicated interest in smoking cessation information. None of the respondents reported problems with violence in the home; however the highly personal nature of this question is possible our data is underestimated. Only postpartum women were asked if they currently needed assistance with breastfeeding and none of the sample indicated they needed help.

Each respondent received information regarding the Illinois Department of Human Services 211 project which directs Illinois residents to a wide variety of health and social services across the state by dialing 211.

## Social Service Needs

\*Confidence Interval

	<b>Yes (n)</b>	<b>Prevalence % 95% C.I.*</b>	<b>No (n)</b>	<b>Prevalence % 95% C.I.*</b>	<b>Don't know/No response (n)</b>
<b>Counseling information for family or self</b>	20	14.8 (9.3, 22.0)	115	85.2 (78.1, 90.7)	
<b>Dental services</b>	12	8.9 (4.7, 15.0)	122	90.4 (84.1, 94.8)	1
<b>Food stamps, WIC, money for food</b>	10	7.4 (3.6, 13.2)	125	92.6 (86.8, 96.4)	
<b>Medical services</b>	6	4.4 (1.7, 9.4)	129	95.6 (90.6, 98.4)	
<b>School or vocational training</b>	5	3.7 (1.2, 8.4)	129	95.6 (90.6, 98.4)	1
<b>Transportation</b>	4	3.0 (0.8, 7.4)	131	97.0 (92.6, 99.2)	
<b>Help to quit smoking</b>	3	2.2 (0.5, 6.4)	132	97.8 (93.6, 99.5)	
<b>Housing</b>	1	0.7 (0.0, 4.1)	134	99.3 (95.9, 100.0)	
<b>Help with alcohol or drug</b>	0		135		
<b>Help to reduce violence in home</b>	0		135		
<b>Help with or info on breastfeeding</b>	0		0		

## **Preferred Method of Receiving Health Information in a Future Disaster**

The internet (28.9%) was the highest ranked method for obtaining information in a future disaster followed by television (27.4%), health care providers (15.6%), church or faith based organizations (7.4%), family or friends (7.4%), radio (5.2%), and community organizations (4.4%). It is not unexpected the internet is the preferred medium. Women eligible to participate in this study (aged 18-45 years) use the internet and social media habitually. Social media, more specifically Facebook, provides an important means for instant communication when compared to mediums such as magazines, newspapers, or radio. Citywide and neighborhood-specific subpopulations' Facebook pages function as an open forum to post information, share resources, recommend construction related services, provide emotional support, weather warnings, locating rental properties and household goods, match volunteers with tasks, legal and news notices, monetary opportunities and express concerns. Moreover, social media played a key role to find relocated families for the research project. While Facebook pages and postings played a vital communication role, recognizing that multiple pages can be created by different groups could help in identifying respondents. The November 17<sup>th</sup> tornado resulted in a number of Facebook pages dedicated to assisting victims, including the following: Georgetown Apts, Washington IL Tornado Recovery, Washington & Central Illinois Tornado Relief & Recovery, Tornado Support: Standing Strong, Washington Strong, Emotion in Motion//Washington Stories and Washington, IL District 52 Relief Fund.

It is common for disaster aid organizations to provide immediate emergency assistance to families after a tornado, such as handing out bottled water, assistance with obtaining

medications and applying tarps to damaged roofs. Daily work orders are prioritized and matched to volunteers who have the appropriate skill set. In order to sustain this initiative after the disaster agencies left, one church in Washington links volunteers with work orders generated by unmet community needs and coordinates all volunteer efforts. Faith based organizations and church outreach efforts provide stability and foster a sense of “community” in addition to a central location to meet the needs of the families affected. Several churches assume a lead role for disseminating information by hosting a monthly meal. Churches are assigned a designated affected neighborhood for the meal which controls group size. Relocated families have an opportunity to reunite with former neighbors and friends which preserves community membership. Many respondents indicated church or faith based organizations as a place for receiving information but only primary sources are included in the following estimates since respondents are limited to one choice.

It is noteworthy that there was some ambiguity associated with the interpretation of the question and associated responses. Some women stated they seek health information from their doctor (health care provider) but use other methods such as the internet to seek information that might include health and safety.

## Receiving Health Information in a Future Disaster

\*Confidence Interval

<b>Method of Health Information</b>	<b>Frequency</b>	<b>Prevalence %</b>	<b>95% C.I.*</b>
<b>Internet</b>	39	28.9	21.4, 37.3
<b>Television</b>	37	27.4	20.1, 35.8
<b>Health Care Provider</b>	21	15.6	9.9, 22.8
<b>Church or Faith Based Org.</b>	10	7.41	3.6, 13.2
<b>Family or friend</b>	10	7.41	3.6, 13.2
<b>Radio</b>	7	5.19	2.1, 10.4
<b>Community Organizations</b>	6	4.44	1.7, 9.4
<b>Health Department</b>	1	0.74	0.0, 4.1
<b>Newspaper</b>	1	0.74	0.0, 4.1
<b>Other</b>	1	0.74	0.0, 4.1
<b>Don't Know</b>	2	1.48	0.2, 5.3