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MEDIA & COMMUNICATION STUDIES | RESEARCH ARTICLE

Measuring outrage through a quantitative study of Iraqi immigrants in Michigan

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Abstract: *Objectives:* To measure the outrage towards five top hazards in Michigan of Iraqi immigrants from Sterling Heights and Dearborn, Michigan to enhance communication efforts. *Methods:* We recruited 84 Iraqi immigrants from two ACCESS community health and research facilities for this study. We utilized the Risk = Hazard + Outrage equation to measure outrage and total risk. Outrage was measured through a new survey instrument based off a list of nine outrage factors per hazard. We also used ANOVA to compare the hazards with each other and hazard and outrage levels. *Results:* Snowstorms were measured to be the highest outrage and power outages measured the lowest. Total risk was highest for snowstorms and lowest for pandemic influenza. *Conclusions:* The results measured outrage for each of the five Michigan hazards, showing what hazards Iraqi immigrants were most worried about. Because snowstorms were measured to have the highest outrage and overall measured risk, emergency preparedness and response professionals need to spend more time educating this group about snowstorms and learn from this group on resilience during power outages.

Subjects: Risk; Communication Ethics; Risk Communication; Communication Research Methods; Health Communication

Keywords: risk; communication; perception; hazard; Iraqi; immigrant

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Dr Kerry Chamberlain key research activities focus on diverse populations and risk communication. The research in the article relates to emergency preparedness and response personnel, specifically communicators and educators. One of the largest issues in emergency response is ensuring messages get to the entire community. Diverse populations are included in emergency plans, but this doesn't mean they are fully understood. This research provides a way to start the process in understanding how a group may view hazards common to the state or locality. One of the surprises of this study was identifying a hazard that Iraqi immigrants were more familiar with, which leads to an exchange of learning. When there are things we can learn from each other, there is a stronger bond between the emergency preparedness and response personnel and the group.

PUBLIC INTEREST STATEMENT

When an emergency strikes, it affects the entire community. However, how emergency response personnel communicates with the public during the emergency can leave out certain groups, intentionally or not. This quantitative study looks specifically at Iraqi immigrants, who constitute the largest subgroup of Arab immigrants in Michigan. We took the top five hazards (tornados, pandemic influenza, power outages, snowstorms and floods) that affect Michigan and measured how worried Iraqi immigrants were about each. Iraqi immigrants were worried most about snowstorms, which is a hazard that does not occur in Iraq. They were least worried about power outages, which occur frequently in Iraq. The results of this study can help do two things: allow for emergency response agencies to better connect with this group before an emergency hits and to better communicate during an emergency.

1. Introduction

Communicating with diverse populations during an emergency is a complex issue (Federal Emergency Management Agency, 2011). When working with new refugee and immigrant populations, conveying emergency information is very difficult (Federal Emergency Management Agency, 2011). Depending on what country the person is from, it alters his or her outlook on common hazards that occur in their new home (Federal Emergency Management Agency, 2011). Risk communication strategy is based on understanding the perception of each group towards the current hazard (Sandman, 1988). Gauging a group's hazard perception requires a more in-depth understanding of what shapes their perception. Without this understanding, the wrong communication strategy may be used and emergency information may miss the intended target. Missing the intended target could be costly for the jurisdiction both in lives lost and possible future litigation (Andrulis, Siddiqui, & Gantner, 2007; Sherry & Harkins, 2011).

There are several theories in the literature regarding risk perception. Mental models involve interviewing the public over several stages to understand their perception of risk (Morgan, 2002). This model provides a thorough evaluation of the perception of risk within a population; however, it is labor intensive and would need to be performed well before any emergency occurs (Morgan, 2002). The extended parallel process model focuses on the fear appeal (Witte, 1992). The fear appeal uses fear to arouse the public to promote action (Peters, Ruiter, & Kok, 2013). The use of fear to promote emergency preparedness is not clear. Fear appeals may work in the short term, especially following a disaster, but may not work when the hazard is less likely to happen (Maloney, Lapinski, & Witte, 2011). The Theory of Reasoned Action and Planned Behavior says the person will base whether or not they will perform an action by how they view it and if it will benefit society (Ajzen, 1991). This theory focuses on one aspect of behavior change: control. Control is one aspect of whether or not someone perceives they are at risk of experiencing a hazard; however, there are more factors that influence a person's view (Covello & Sandman, 2001). Finally, the Risk Information Seeking and Processing Model focuses on whether or not the public will seek the information they need about a hazard (Griffin, Dunwoody, & Neuwirth, 1999). Risk perception is a part of this model, but this applies to seeking information, not how best to communicate.

The way we chose to measure hazard perception is utilizing Dr Peter Sandman's Risk Equation (Risk = Hazard + Outrage) (Sandman, 1988). Although the major models and theories touch on different aspects of outrage, they do not perform a comprehensive measurement of how worried a person is concerning a hazard. The risk equation takes into account the worry of an individual or group about a hazard along with the actual hazard to show risk. The hazard part of the equation is a constant. The hazard is measured by current and historical data. Each person will not view a hazard in the same way. Measuring outrage quantifies how worried an individual is about a hazard. Measuring outrage in a sample from the same cultural group can give an overall average of worry about the same hazard.

This equation is typically analyzed qualitatively (Sandman, 1988). The hazard is considered high, medium or low and the outrage is also high, medium or low (Sandman, 1988). Depending on the combination of hazard and outrage, there is a communication method that corresponds to the risk level. If the outrage level is high towards a hazard which is low, the method is to lower the outrage level, also called outrage management (Sandman, 1988). If the outrage level is low and the hazard is high, then the method is to promote more concern, also called precaution advocacy (Sandman, 1988). Finally, if the hazard and the outrage towards that hazard are both high, the method would be to control the crisis by getting as much information out to the public as quickly as possible, also known as crisis communication (Sandman, 1988). However, in order to get a more accurate picture of outrage and hazard we decided to use the equation quantitatively.

The way to use the risk equation quantitatively is by quantifying both the hazard and outrage. Hazard can be quantified by hazard frequency. Outrage can be quantified by utilizing the 20 outrage factors (Covello & Sandman, 2001). The outrage factors are in a range from high to low. For example,

for the outrage factor human versus natural origin of hazard outrage is higher for hazards that are manmade versus hazards that are natural (Covello & Sandman, 2001). One of the reasons behind this is that manmade hazards are considered preventable whereas natural hazards are not (Covello & Sandman, 2001). Because there is a range from high to low, a scale can be applied to measure the outrage.

In the literature, Dr Sandman's risk equation has not been used to measure the perception of an immigrant group to local hazards. The mostly widely used applications are in crisis communication for which an entire guidance has been written by the Centers for Disease Control and Prevention (Centers for Disease Control, 2014). The main goal of this crisis communication guidance is "Be first, be right, be credible" (Centers for Disease Control, 2014). Getting the emergency information out as quickly as possible is key. However, this guidance hinges on the communicators' already establishing communications pathways prior to an emergency. This also includes diverse populations. An example of this issue is Hurricane Katrina in 2005 where communications were not all-inclusive (Waymer & Heath, 2007). The emergency communications missed an entire section of the population: African Americans and those of low socioeconomic status (Waymer & Heath, 2007). Further, the agencies responsible for the emergency communication were not coordinated (Garnett & Kouzmin, 2007). One of the lessons learned from this emergency was governmental agencies must provide a coordinated message to reduce confusion and ensure the message is unified (Garnett & Kouzmin, 2007). With many different messages coming from different agencies and also a lack of transparency, they were viewed by the public as not being able to do their jobs (Garnett & Kouzmin, 2007).

Michigan has one of the largest populations of Arab refugees and immigrants (Arab American Institute Foundation, 2015). The largest group is from Iraq (Arab American Institute Foundation, 2015). Because the group is a major population in the Metro Detroit area of Michigan, we decided to measure their outrage levels to five top hazards in the state and compare them to the frequency of the hazard. Arab Americans are a group who are not well studied in regards to emergency risk communication (Abdulahad, Delaney, & Brownlee, 2009; Arnetz, Rofa, Arnetz, Ventimiglia, & Jamil, 2013; Jamil, Nassar-McMillan, & Lambert, 2007; Rousseau, Hassan, Moreau, & Thombs, 2011; Shoeb, Weinstein, & Halpern, 2007; Sirkeci, 2005). The literature regarding Arab Americans focuses on other issues such as psychological stress and culture (Sirkeci, 2005). One of the reasons Arab Americans may have not been studied in regards to public health preparedness is the social stigma surrounding the group following the 11 September 2001 terrorist attacks (Rousseau et al., 2011; Shoeb et al., 2007).

We worked with Arab Community Center for Economic and Social Services (ACCESS) which is the largest organization in the country for helping Arab immigrants adapt to life in the United States (Arab Community Center for Economic & Social Services, n.d.). They have two research center locations. One in Sterling Heights, Michigan and one in Dearborn, Michigan. The purpose of this study was to explore the perceptions by Iraqi immigrants of the five top hazards that occur in Michigan. Our research question is as follows: to what degree does the risk equation explain the relationship between the five top hazards in Michigan and the outrage level of Iraqi immigrants.

1.1. Hypothesis

- H_0 : There is no statistically difference in the outrage ratings of Iraqi immigrants living in Sterling Heights and Dearborn, Michigan for each of the top five hazards.
- H_1 : There is a statistical difference in the outrage ratings of Iraqi immigrants living in Sterling Heights and Dearborn, Michigan for each of the top five hazards.

2. Methods

This is the quantitative portion of a mixed method study. We selected participants based on the following criteria: (1) living in the United States for four years or less, (2) an adult aged 18 or older, and

(3) living in the Sterling Heights or Dearborn Michigan areas. The participants were selected at the Sterling Heights and Dearborn community health and research centers of ACCESS. They were recruited through classes, WIC clinics, and through case workers. All participants ($n = 84$) were interviewed in person using a newly created survey instrument that measured outrage. Outrage was measured using nine Likert scale questions based on the outrage factor list created by Covello and Sandman (2001). Each question could be answered with strongly disagree, disagree, neither agree or disagree, agree or strongly agree. Of the total of 20 factors, nine were used to assess the hazard experience. The nine factors listed below included: controllability, familiarity, catastrophic potential, understanding, delayed effect, dread, personal stake, uncertainty and human versus natural origin (Covello & Sandman, 2001). The survey instrument adjusted for experience. The nine factors did not require experience. An example of a question that measured controllability is “I feel I can control whether or not a [name of hazard] occurs.” The outrage is a sum of all of the outrage factors. Each factor is measured, but there is no one measure which determines overall outrage.

All interviews were conducted at either the Sterling Height or Dearborn, Michigan ACCESS research centers. Each interview took an average of 30 min. All interviews were audio recorded. Each interviewee had the option of utilizing an interpreter. All interviewees had a copy of the survey instrument in English or Arabic during the interview.

The hazards were selected from the 2012 Michigan State Police Hazard Vulnerability Assessment (Michigan State Police Emergency Management & Homeland Security Division, 2012). The hazards that were considered most frequent were chosen from the report. The final list of hazards included three natural disasters (severe tornado, severe flood, and snowstorm), one technological hazard (power outage), and a public health hazard (pandemic influenza). We measured each hazard by the average frequency of occurrence over a ten-year period from 2004 to 2014. Event data were gathered from the National Climate Data Center, World Health Organization, and the US Department of Energy.

A small pilot test was conducted to refine the language of the survey instrument. The instrument was tested with five Iraqi immigrants. Initial results regarding literacy suggested a low level for Iraqi immigrants (World DataBank, 2014). However, it was discovered literacy was much higher than expected and it allowed for adding in a hard copy of the survey instrument for each participant in Arabic and English to help with question comprehension. We analyzed the data with IBM Statistical Package for Social Sciences (SPSS) version 22. We performed ANOVA comparing hazards between each other and hazards and outrage. Each person was given a \$10 gift card to a local retailer for his/her participation. We performed the study under Walden IRB approval number 02-24-15-0071099.

3. Results

All interviews were conducted from March to November of 2015. Table 1 shows the demographics of the study sample. Most of the sample interviewed were 29–39 years old, female, and from Sterling Heights, Michigan (Table 1). Of those interviewed, 58 were conducted in Arabic, with the aid of an interpreter, and 26 were in English. The average time living in the United States was 40.25 months, with the majority of the interviewees in the United States from 36 to 48 months. Most interviewees had a high school diploma (37%) or a bachelor’s degree (19%).

The outrage score was measured by the sum of the responses to nine questions for each hazard. Each question had a high of five points to a low of one point. Strongly disagree corresponded to the lowest point value with strongly agree corresponding with the highest point value. The total scores were then stratified by low, medium, and high levels of outrage. Low outrage was 9–15 points; medium outrage was 16–27 points; and high outrage was 28–45 points. Table 2 shows the outrage

Table 1. Study sample

Sample demographics (n = 84)	
Age	
18–28	16 (19%)
29–39	29 (35%)
40–50	18 (28%)
51–61	14 (17%)
61+	7 (8%)
Sex	
Male	26 (31%)
Female	58 (69%)
Location	
Sterling heights	57 (68%)
Dearborn	27 (32%)

Note: Data are based on surveys that were conducted March–November 2015.

Source: Adapted from “A concurrent mixed method study exploring Iraqi immigrants’ views of Michigan hazards,” by K. L. Chamberlain, 2016. Adapted with permission.

Table 2. Mean and median outrage scores for the top five hazards in Michigan (n = 84)

	Mean	Median
Severe tornado	28.5	28.0
Pandemic influenza	26.7	27.0
Power outage	23.7	24.0
Snowstorm	31.7	32.0
Severe flood	28.3	29.0

Note: Data are based on surveys that were conducted March–November 2015.

Source: Reprinted from “A concurrent mixed method study exploring Iraqi immigrants’ views of Michigan hazards,” by K. L. Chamberlain, 2016. Reprinted with permission.

measurement for each of the five hazards. Outrage measured the highest for snowstorms. Power outages measured the lowest outrage of the five hazards. Severe tornado, pandemic influenza, and severe flood all measured medium to medium-high outrage.

Table 3. Michigan hazard frequency from 2004 to 2014

	Total occurrences per 10 years	Hazard frequency per year
Severe tornado ^a	76	7.6
Pandemic influenza ^b	1	0.1
Power outage ^c	84	8.4
Snowstorm ^d	188	18.8
Severe flood ^e	80	8

Source: Adapted from “Exploring how Iraqi immigrants view five top hazards in Michigan through a concurrent mixed method study,” by K. L. Chamberlain, 2016. Adapted with permission.

^aFrom the National Climate Data Center. Michigan number of days with the event—Tornado.

^bFrom the World Health Organization. Global Influenza Programme—Evolution of a pandemic A(H1N1) 2009.

^cFrom the US Department of Energy. Number of Events—Power Outages—Michigan.

^dFrom the National Climate Data Center. Michigan number of days with the event—Winter Storm.

^eFrom the National Climate Data Center. Michigan number of days with the event—Flood.

Table 4. Post hoc test—Tukey HSD—hazard comparison

(I) Hazard	(J) Hazard	Mean difference (I - J)	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
Tornado (1.0)	2.0	6.8182*	1.9273	0.008	1.364	12.272
	3.0	-0.7273	1.9273	0.996	-6.181	4.727
	4.0	-10.1818*	1.9273	0.000	-15.636	-4.728
	5.0	-0.3636	1.9273	1.000	-5.817	5.090
Pandemic influenza (2.0)	1.0	-6.8182*	1.9273	0.008	-12.272	-1.364
	3.0	-7.5455*	1.9273	0.002	-12.999	-2.092
	4.0	-17.0000*	1.9273	0.000	-22.454	-11.546
	5.0	-7.1818*	1.9273	0.004	-12.636	-1.728
Power outage (3.0)	1.0	0.7273	1.9273	0.996	-4.727	6.181
	2.0	7.5455*	1.9273	0.002	2.092	12.999
	4.0	-9.4545*	1.9273	0.000	-14.908	-4.001
	5.0	0.3636	1.9273	1.000	-5.090	5.817
Snowstorm (4.0)	1.0	10.1818*	1.9273	0.000	4.728	15.636
	2.0	17.0000*	1.9273	0.000	11.546	22.454
	3.0	9.4545*	1.9273	0.000	4.001	14.908
	5.0	9.8182*	1.9273	0.000	4.364	15.272
Severe flood (5.0)	1.0	0.3636	1.9273	1.000	-5.090	5.817
	2.0	7.1818*	1.9273	0.004	1.728	12.636
	3.0	-0.3636	1.9273	1.000	-5.817	5.090
	4.0	-9.8182*	1.9273	0.000	-15.272	-4.364

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*The mean difference is significant at the 0.05 level.

Table 3 shows the hazard frequency of five top hazards in Michigan. We calculated the hazard frequency per year by summing the total hazard occurrences over the ten year period and dividing by ten. The hazard frequency per year was then used as the hazard part of the risk equation for each hazard type. ANOVA was performed to compare the hazards to each other. The post hoc tests were used to compare the hazard (Table 4). Pandemic influenza and snowstorms were significantly different than all of the other hazards. Severe floods, severe tornado, and power outages were not significantly different than each other and all were significantly different than snowstorms and pandemic influenza.

Table 5 shows the total risk for each of the five top hazards in Michigan for Iraqi immigrants. There is not a formal scale for risk, however, the numbers are able to be used as a comparison between

Table 5. Total risk for the top five hazards in Michigan utilizing the risk = hazard + outrage equation (n = 84)

	Hazard frequency per year	Mean outrage score	Total risk
Severe tornado	7.6	28.5	36.1
Pandemic influenza	0.1	26.7	26.8
Power outage	8.4	23.7	32.1
Snowstorm	18.8	31.7	50.5
Severe flood	8.0	28.3	36.3

Note: Data are based on surveys that were conducted March–November 2015.

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hazards. The highest risk to the Iraqi immigrants in Sterling Heights and Dearborn, Michigan is the snowstorm which shows the highest frequency and highest outrage. The lowest risk as compared to the other hazards is pandemic influenza. Severe tornado, power outage, and severe flood are all measured to be of similar risk to this population.

We calculated ANOVA to compare the hazard and outrage variables for each hazard type to determine if there was a significant difference between them. The ANOVA test alone did not show enough information to compare each of the hazards to their corresponding outrage measurement. It only stated there was a significant difference without the individual hazard comparison. However, the post hoc test did show the variance between the hazards and the outrage measured for each. The post hoc test results are shown in Table 6. Pandemic influenza, snowstorm, and power outage outrage scores were significantly different from all other hazards. Severe tornados and severe flooding were not significantly different than each other but were significantly different than all other hazards. Therefore H_1 is accepted for pandemic influenza, snowstorm, and power outage and rejected for tornado and snowstorm.

Table 6. Post hoc test—Tukey HSD—hazard and outrage comparison

(I) Hazard	(J) Hazard	Mean difference (I - J)	Std. error	Sig.	95% confidence interval	
					Lower bound	Upper bound
Tornado (1)	2	1.929*	0.483	0.001	0.60	3.25
	3	4.845*	0.483	0.000	3.52	6.17
	4	-3.167*	0.483	0.000	-4.49	-1.84
	5	0.190	0.483	0.995	-1.13	1.51
Pandemic influenza (2)	1	-1.929*	0.483	0.001	-3.25	-0.60
	3	2.917*	0.483	0.000	1.59	4.24
	4	-5.095*	0.483	0.000	-6.42	-3.77
	5	-1.738*	0.483	0.003	-3.06	-0.41
Power outage (3)	1	-4.845*	0.483	0.000	-6.17	-3.52
	2	-2.917*	0.483	0.000	-4.24	-1.59
	4	-8.012*	0.483	0.000	-9.34	-6.69
	5	-4.655*	0.483	0.000	-5.98	-3.33
Snowstorm (4)	1	3.167*	0.483	0.000	1.84	4.49
	2	5.095*	0.483	0.000	3.77	6.42
	3	8.012*	0.483	0.000	6.69	9.34
	5	3.357*	0.483	0.000	2.03	4.68
Severe flood (5)	1	-0.190	0.483	0.995	-1.51	1.13
	2	1.738*	0.483	0.003	0.41	3.06
	3	4.655*	0.483	0.000	3.33	5.98
	4	-3.357*	0.483	0.000	-4.68	-2.03

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*The mean difference is significant at the 0.05 level.

The equation explains the relationship between hazards in Michigan and outrage in only one dimension. The equation does not explain the reasons why a person may be worried about the hazard. They may answer the question regarding dread as “strongly agree” (I am afraid of [hazard]), then answer the controllability question as “strongly agree” (I can control [hazard]). Heightened fear increases the total outrage towards the hazard while feeling in control of the hazard lowers the total outrage. The quantitative analysis does not explain why someone feels he/she can control the hazard or why they are afraid.

4. Discussion

Utilizing Dr Sandman’s risk equation, we were able to measure the outrage level of five top hazards in Michigan of Iraqi immigrants (Sandman, 1988). Snowstorms were measured to be the most worrisome to this group. One of the reasons may be their lack of experience with snow in general. We checked historical weather data and found Iraq does not experience snow at all (National Oceanic & Atmospheric Administration – National Climate Data Center, 2009). This finding may be surprising to many who have lived their entire lives in Michigan where snow is a common occurrence. However, this group needs more help with learning about snowstorms and can benefit from the experience of those who are more accustomed to the snow.

Power outages were found to be the least worrisome to Iraqi immigrants. While the total risk of a power outage was higher than pandemic influenza, some of the qualitative data collected during the quantitative interviews was telling. Many of the interviewees either laughed at the power outage questions or made a statement about living frequently for 24 hours per day without power. This means this group is somewhat worried about power outages, but are able to handle them because they occur frequently. The total risk takes into account the frequency of the hazard. The outrage level is lower; however, due to the hazard frequency the total risk is higher. In our education efforts on public health preparedness, it would be better to learn from this population rather than teach them.

Pandemic influenza was found to be the lowest risk. However, the answers to the questions on the survey instrument may be more indicative of seasonal influenza than pandemic influenza. One in particular should have garnered a “strongly agree” or “agree” answer from everyone interviewed. The question of “I have experienced an influenza pandemic before” was answered mostly with “disagree” or “strongly disagree”. Everyone interviewed would have experienced the 2009 H1N1 influenza pandemic (World Health Organization, 2013). These data show that this group may not have understood fully what an influenza pandemic was, or not have personally experienced it prior to the interview.

Hazard severity was not utilized to quantify the hazard variable in the equation. The goal was to measure the likelihood of a particular hazard occurring rather than severity. While severity is an important factor in emergency preparedness planning efforts, it was not as important in this study. It was more important to measure frequency to show a hazard that is likely to happen rather than one that may be severe, but very rare. The hazards chosen were of the top five outlined in the 2012 Michigan Hazard and Vulnerability Assessment (Michigan State Police Emergency Management & Homeland Security Division, 2012).

5. Conclusion

This information can be used as a starting point for emergency preparedness and response agencies to reach out to the groups within their jurisdiction. The data measured high outrage levels towards snowstorm in this group, and emergency preparedness and response agencies with high populations of Iraqi immigrants can reach out and educate on the basis of this research. This would not only help the Iraqi immigrants in Michigan, but also the emergency plans to become more inclusive. While the Metro Detroit area houses the majority of Iraqi immigrants, other counties such as Genesee, Kent, Ingham, and Washtenaw also have growing populations (United States Census

Bureau, 2010). The survey instrument developed for this study could be used for other immigrant populations. The data provides a clearer picture for emergency planning purposes.

Our study also had limitations. This study examined one group of non-Western immigrants from one location in the United States. This may not apply to different non-Western immigrant groups in other states. Even Iraqi immigrants may be different depending on which state they decide to live. The American culture between different states can vary widely. Hazards also vary between states. In Michigan, earthquakes are not a major hazard while in California, they are (Michigan State Police Emergency Management & Homeland Security Division, 2012; United States Geological Society, n.d.). Because of this, there needs to be further study of Iraqi immigrant populations in other parts of the United States. Using a Likert scale was difficult as it took several questions into the interview for the participant to use the scaled answers, instead of “yes” or “no” without prompting.

The biggest public health implication is the saving of lives. The better we understand all of the different groups that live within our jurisdictions, the better chance to save more lives in an emergency (Federal Emergency Management Agency, 2011). The goal of this study was to measure the outrage of Iraqi immigrants toward top hazards in Michigan. Iraqi immigrants have different concerns than others in Michigan. Measuring the outrage levels showed where the concern was greatest for this population. Power outages are normal for Iraqi immigrants and less so for the majority of Michiganders. Snowstorms are less of a concern to the majority of Michiganders than Iraqi immigrants. This information may help governments’ better plan for Iraqi immigrants’ inclusion in emergency management plans. Michigan, as well as other states with large Iraqi immigrant populations, need this data to increase the speed with which information is relayed during an emergency. It may also help public health and emergency personnel make connections with immigrant populations before emergencies. Pre-event planning and education can help those who need to understand the hazards that affect where they live. The biggest public health implication is the saving of lives. The better we understand all of the different groups that live within our jurisdictions, the better chance to save more lives in an emergency (Federal Emergency Management Agency, 2011).

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