

Disaster Threats to Vulnerable Populations:
Cultural Competency Critical to Disaster Threats©

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ABSTRACT

This study examines the link between culture and emergency preparedness. It focuses on preparing vulnerable populations for emergencies by identifying the need for developing culturally competent protocols for vulnerable populations in response to disaster threats. My research questions the level of preparedness in cultural minority communities and determines that cultural incompetency in fact exists. A lack of understanding of the needs of these vulnerable minority populations puts them at greater risk than “mainstream” communities. Despite efforts by public administration disaster management systems to improve organizational infrastructure addressing disasters, minority communities remain an “Achilles heel” in the overall preparation program. The study combines an ethnographic or “portrait of a people” study with an exploratory cross-sectional research design. The ethnographic study examines two cultural minorities in the state of Maine – the Passamaquoddy tribe on Pleasant Point Reservation and the Somali refugee community in the city of Lewiston. The study consists of unstructured stakeholder interviews, focus groups and observation. These study-specific surveys take into account the possible cultural parameters that may affect preparedness.

Based on the analysis of the data, it is possible to pinpoint specific areas where intervention and training can be implemented to increase preparedness levels. This cutting edge research examines the parameters within which the basic differences

between mainstream and minority communities exert a direct effect on their respective abilities to prepare for disaster threats. The research has both internal and external validity as the findings can be generalized across a broad spectrum of vulnerable populations in America and throughout the world.

METHODOLOGY

The purpose of this study was to identify cultural characteristics that differentiate three distinct cultural groups (Passamaquoddy, Somali, mainstream) and how they affect preparedness, and to compare the risk perception of the three different cultural groups.

Identify cultural characteristics that differentiate 3 distinct cultural groups (Passamaquoddy, Somali, mainstream) and how it affects preparedness. Compare the risk perception of the three different cultural groups.

Research Design

This study was a combination of an ethnographic study and exploratory cross-sectional research design. The ethnographic or “portrait of a people” study, a social science research method, consists of unstructured stakeholder interviews, focus groups, observation and surveys developed specifically for this study while taking into account the possible cultural parameters that may affect preparedness. The ethnographic study taps a “local point of view”, and based on new paradigms and variables it will encourage further empirical testing to help develop policy based on a new perspective. My interest in this topic is a result of living in a country frequented by war, drought and earthquakes. Inspired by the need to improve preparedness in minority communities during disaster, and by utilizing participant-observation technique, I was able to flag issues that will help develop plans that will hopefully improve preparation and response in these communities.

The analysis of the data discusses the link between culture and preparedness, identifying both objective and subjective parameters. It imparts specific information of the direction and intensity of the relationship at each node between process variables. In addition, a cross sectional study was performed to evaluate the preparedness of minorities for

disaster events compared to mainstream population, as well as to identify the culturally specific needs of each group.

Hypothesis Definitions

General hypothesis.

1. There will be differences in the needs in disaster preparedness planning in minority/vulnerable participants compared to mainstream participants due to the differences in cultural beliefs and traditions.
2. There will be differences in the cultural traditions, rituals and beliefs in minority/vulnerable participants compared to mainstream participants.
3. There will be differences in the risk perception of minority/vulnerable participants compared to mainstream participants due to the differences in cultural beliefs and traditions.

Specific hypothesis.

1. The Somalis are expected to be less acculturated into American society as they lack English language skills, maintain culturally specific rituals and utilize social networks for support and accessing information (as opposed to utilizing government /media support) and as a result have inferior tools needed for accessing information when preparing for emergencies.
2. The Passamaquoddy are expected to be less trusting of government during emergencies, have no emergency kits at home, and are less likely to leave their homes in case of emergency due to past detrimental experiences, e.g. during the outbreaks of TB and polio.

3. In both minority groups, most people will neither have emergency preparedness kits (due to lack of funds) nor will they have discussed with their family plans of action in case of emergency.

Method: Questionnaire

The questionnaire was based on a preexisting survey used by the XXXXX in a study on civilian behavior during the Lebanese war in 2006 and on my own experience of treating and working with different cultures in Israel and America during crisis. An identical questionnaire was distributed to all three groups in Maine. The Somali population data was pre-collected in early 2008 in collaboration with the Office of Minority Health in the state of Maine. We performed a pilot study in the Somali community to clarify the need for a broader study. Some questions could have been repeated to clarify validity, but the sampling and results did present an accurate representation of the minority communities, therefore leading me to believe they are valid, if not scientific. The questions reflected demographics, cultural beliefs, and traditions and flagged issues influencing objective and subjective preparedness. As this is a preliminary research study, validation was difficult, given the lack of base population figures and previous studies. The questionnaire included 44 questions and could be completed in 15-20 minutes. (See Appendix D).

Sample Evaluation. Sample size: A total of 157 questionnaires were administered. Sixty-three Passamaquoddy, 59 Somali and 35 mainstream questionnaires represent a sample of each cultural group. The sampling design was randomized convenience sampling. The Indians live on Pleasant Point Reservation in Northern Maine, the Somali population inhabits Lewiston, Maine and the mainstream respondents were randomly

selected throughout central Maine. As the study is exploratory, no exact sample size calculations were performed.

Respondent rate: The respondent rate among the Passamaquoddy was insufficient at the Indian Day festivities, yet when the cultural broker went from house to house, the respondent rate was 100%. The respondent rate for the mainstream was 70% and for the Somali close to 100%.

Sampling ratio. A non probability convenience sample with high representation rate for the minorities was used in this study. The representation rate for each population was as follows: the Passamaquoddy returned 63 surveys in a population of 2005 (3.14%); the Somali returned 59 surveys in a population of approximately 3750 (1.57%); and the mainstream returned 35 surveys in population of 1,200,000 (0.003%). Due to the large size of the mainstream population, it is treated as an infinite number and was added to the study as a “control” to the other populations and to validate the study results.

Inclusion/Exclusion Criteria. Inclusion criteria included anyone from one of the three study groups who was over the age of 18 and willing to respond after receiving an explanation of the study and giving oral consent. Anyone under the age of 18 was excluded.

Recruitment process. The project sought to recruit members of vulnerable minority communities. A booth was set up at Indian Day festival at Pleasant Point reservation. Anyone interested in answering the survey received a flashlight or bag for emergency items. One fourth of the surveys were answered at this event. The remaining surveys were collected by an experienced research assistant and cultural broker. Using this method, respondents were happy to participate. We collaborated with community

members to conduct an ethnographic assessment. We recruited participants by going house to house with a community member explaining the purpose of the project and requesting participation. The study was approved by the institutional review board of Northeastern University. The average life expectancy in this tribe is 47 years old and just 17% of the population is over 40 years of age. This sample represented more of the elder population with average age 41.7 ± 13.7 .

The cultural brokers¹ who performed the surveys among the Somali community were part of that community, shared its religious belief and were fluent in the Somali language.² The predominance and influence of the Somalis' Islamic beliefs were noticeable in the respondents' language (Min Allah), dress and behavior during interviews and discussion groups. Participants often repeated that "everything is from Allah" when describing that fate is in Allah's hands and therefore this affects the significance of preparedness and prevention of disasters. Despite widespread illiteracy, there was a significant understanding of the teachings of the Koran and the need to maintain its importance in people's lives. The low number of male responses reflects the very low population of Somali males in Lewiston. Exact numbers are unknown, but the majority of the population is made up of single mothers.

¹ Cultural brokers are those who mediate between one with certain cultural beliefs and another's professional goals. The broker needs to be very familiar with the client's traditions, beliefs and language.

² The pre-collected data from the Somali population was attained with the generous help of the United Somali Women organization in Lewiston, Maine.

I myself collected the surveys from the mainstream population – students, colleagues and acquaintances in Maine – after explaining to them the purpose of the survey and obtaining oral consent.

Informed consent, risk, and referral. An oral consent form was used as there was no risk involved in the survey and no identifying information was collected.

Managing Research Challenges

Cultural Barriers and preconceptions among the Passamaquoddy made it difficult for me to personally get them to answer the surveys. They have been over-researched without reaping any benefits, and were at first reluctant even to hear an explanation. They also have a negative relationship with federal and state government and retain anger at the lack of understanding and support they receive, not to mention past abuse and present marginalization. It was difficult to explain to them that I was not a government official and only represented myself with the intention of helping them develop their own EP plan suited to their community's needs. Once a member of their community was engaged in collecting the data, they were much more responsive and even interested in participating.

The main challenge with the Somali was the language barrier. But because I am familiar with Muslim culture and customs, it was actually easier for me to communicate with them (despite the language barrier) than with the Passamaquoddy. We had in common the experience of war and, in many cases, of being single mothers, and we built a strong bond that made our meetings relaxed and unguarded.

Maintaining Ethical Standards

To ensure the protection of the respondents, the questionnaire and an oral consent form was submitted and approved by the IRB (institutional review board) at Northeastern University.³ The results of the research will be distributed to the communities that participated in the research so they can improve their EP response and hopefully continue to work symbiotically with me so develop plans. There was no risk involved in the study

Statistical Methods

As mentioned before, the study was exploratory in nature, and therefore, the hypotheses examined were not specific in terms of magnitude of effect, and no power assessment and sample size calculations were performed at the design phase. Therefore, the interpretation and the robustness of the results of the analyses are not exclusively based on p-values as an evidence of study success, but examined mainly by the consistency of the results; no adjustment for multiplicity was performed. Despite the above, the significance level was defined as $\alpha=0.05$ meaning that $p\text{-value}<0.05$ was considered as statistically significant, to enable the flagging of prominent results.

The statistical reporting and analyses compared each cultural group to the mainstream as follows: Descriptive statistics for continuous variables were calculated and reported as the mean, median, standard deviation, standard error, minimum and maximum values of

³ To ensure subjects' protection, no identifying information was collected and only adults over the age of 18 were considered as participants. A translator (when needed) and cultural broker were present during the surveys. Participating populations received an explanation of the study's purpose, were told that participation was voluntary and that not completing the survey was an option. An oral consent form was offered, with the main investigator's contact information should there be questions.

n observations and were presented by group. These continuous variables were tested using Analysis of Variance (ANOVA) followed by Dunnett post hoc tests to compare each one of the minorities to the mainstream group.

Categorical variables were described using contingency tables by group including frequency and percent. Differences between groups were assessed using χ^2 test followed by Fisher exact test in cases that the overall comparison demonstrated $p < 0.05$. In the case that one of the groups did not answer a question, missing values were removed from the statistical analysis. The sample size therefore varied from question to question.

Statistical analyses were carried out on SPSS Inc. 15.02 software.

Definition of the dependent variable: Preparedness

The dependent variable is (emergency) preparedness, described as the intent by a community, individual or disaster agency to minimize death, injury and economic loss.⁴ Preparedness was measure by both subjective and objective preparedness.

Subjective preparedness. Subjective preparedness was measured by the direct question: “Do you feel prepared to deal with threats?”

Objective preparedness. For the purpose of this study we created a measurement scale for objective preparedness. The score was based on the combination of the following five items: a) English literacy (oral, written, comprehension); b) access to information (internet, TV, media); c) trust (police, army, politicians); d) emergency behavior (have been informed, family discussion, family plans); and e) information

⁴ Preparedness is defined as a sum of concrete behaviors that evolve from perceptions that individuals and groups develop in the face of disasters. (Kirschenbaum 1992).

received from the government. Each item contributed one unit to the respondent's score; therefore the preparedness score ranged from 0 (=not prepared) to 5 (=totally prepared). A score of >3 defined an objectively prepared subject, and a score <3 defined an objectively non prepared subject.

Definition of the independent variable: Culture

The independent variable is culture, meaning that all the dependent variables were analyzed and compared by cultural parameters. These included a) social/cultural background; b) social networks; c) access to information; d) gatekeeper effect; e) risk perception; and f) past experiences with disaster.

Strengths and Limitations

This research has a several important strengths, primarily the fact that the study contributes data to a virtually untouched area, disaster management in minority populations. This qualitative analysis allowed the “voice of the people to be heard” that can be used as a base for further research in developing disaster management plans for minority cultures. The study will hopefully strengthen the relationships among the communities by working together to develop these plans while bringing to the attention of mainstream communities the exceptional social infrastructure among collectivistic cultures such as the Passamaquoddy and Somali refugee population. In addition by empowering the women in these minority communities to manage the communication networks during emergency situations, we are also utilizing the inbred skills of community networking (in which women are so competent) while minimizing the risk of domestic violence, which is common during times of emergencies. The influence on preparedness of a community's geographical location does need to be addressed. This study, however, focused on cultural influences, which, as the study results show, proved more significant than location.

CHAPTER SIX

DATA FINDINGS

Data:

A total of 157 questionnaires were evaluated in three different cultural groups:

	<i>N</i>	%
Passamaquoddy	63	40.1%
Somali	59	37.6%
Mainstream	35	22.3%
Total	157	100.0%

Results:

1. General characteristics:

Table 1.1: Gender distribution

Gender	<i>Passamaquoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
	N	%	N	%	N	%	N	%	
Female	37	59.7	47	83.9	20	60.6	104	68.9	0.009
Male	25	40.3	9	16.1	13	39.4	47	31.1	

* P value by χ^2 test,

Somali different than Mainstream (p=0.021, Fischer exact test)

Table 1.2: Age and years living in America distribution

		<i>P.quoddy</i>	<i>Somali</i>	<i>Mainstream</i>	<i>Total</i>	P value
Age	N	63	51	32	146	0.001*
	Mean	41.7	33.4	33.6	37.0	
	Median	43	31	30	35	
	SD	13.7	12.6	12.9	13.7	
	SE	1.7	1.8	2.3	1.1	
	Min	18	18	16	16	
	Max	78	67	60	78	
Years living in America	N		50	30	86	<0.001**
	Mean		7.8	31.5	18.7	
	Median		6	25	13	
	SD		5.7	12.6	16.0	
	SE		0.8	2.3	1.7	
	Min		1	16	1	
	Max		25	60	64	

*P value by ANOVA

**P value by T- test

Table 1.3: Continent of birth

	<i>Passamaquoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>	
	N	%	N	%	N	%	N	%
America	61	100	0	0	31	93.9	92	61.7
Africa	0	0	55	100	0	0.0	55	36.9
Europe	0	0	0	0	1	3.0	1	0.7
Asia	0	0	0	0	1	3.0	1	0.7

Gender: Table 1.1 refers to gender distribution. There are significant differences in the gender distribution (p=0.009, χ^2 test); there is a higher percentage of women in the Somali group, 83.9% vs. 60.6% in the Mainstream (p=0.021, Fisher exact test). The

reason for this is that there are not many male Somali refugees in Lewiston, most of the population is single mothers with children.

Age: Table 1.2 refers to age groups. There are significant differences in the age distribution ($p=0.001$, ANOVA); the Passamaquoddy group is significantly older than the Mainstream group ($p=0.009$, Dunnett test).

Years in America: There is very little information about the Passamaquoddy group ($N=6$). The tribal representative explained that asking questions 3 to 6 (see Appendix D) could be offensive. Therefore those specific questions were eliminated after the first few questionnaires were distributed. The Passamaquoddy see themselves simply as native to this country and do not view themselves as citizens. (See table 1.4.)

Continent of birth: Table 1.3 shows 93.9 % of the Mainstream and 100% of Passamaquoddy were born in the USA. 100% of Somali were born in Africa.

Table 1.4: Citizenship

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
U.S. citizen	Yes	7	100.0	19	33.3	33	100.0	59	60.8	<0.001
	No	0	0.0	38	66.7	0	0.0	38	39.2	
Refugee	Yes	0	0.0	45	88.2	0	0.0	45	49.5	<0.001
	No	7	100.0	6	11.8	33	100.0	46	50.5	
Came voluntarily to U.S.	Yes	3	75.0	36	64.3	13	76.5	52	67.5	0.395
	No	1	25.0	20	35.7	4	23.5	25	32.5	

*P value by Fisher exact test

There are significant differences in all measurement except “Came voluntarily to U.S.”

The majority of Somali and Mainstream came voluntarily. Most of the Passamaquoddy did not answer this question, therefore the data is based only on the 7 that did.

Table 1.5: Primary language description

	<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
	N	%	N	%	N	%	N	%	
English language	56	90.3	0	0	31	100	86	57.3	<0.001
Passamaquoddy language	6	9.7	0	0	0	0	7	4.7	
Somali language	0	0.0	57	100	0	0	57	38.0	

*P value by χ^2 test

The primary language is English both for the Passamaquoddy and the Mainstream group (90.3% and 100% respectively). For the Somali group, the primary language is Somali (100%); there is a significant difference from Mainstream, $p < 0.001$ Fisher exact test.

Table 1.6: Level of English

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
English speaking	Yes	63	100.0	39	67.2	33	100.0	135	87.7	<0.001
	No	0	0.0	19	32.8	0	0.0	19	12.3	
Understands English	Yes	62	100.0	41	70.7	33	100.0	136	88.9	<0.001
	No	0	0.0	17	29.3	0	0.0	17	11.1	
Reads English	Yes	63	100.0	35	61.4	33	100.0	131	85.6	<0.001
	No	0	0.0	22	38.6	0	0.0	22	14.4	
Reads newspaper	Yes	56	91.8	21	41.2	26	81.3	103	71.5	<0.001
	No	5	8.2	30	58.8	6	18.8	41	28.5	

*P value by χ^2 test

There are significant differences in all measurements of English proficiency between Somali and Mainstream (p<0.001, Fisher exact test).

Table 1.7: Employment description

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Currently employed	Yes	42	66.7	33	60.0	28	84.8	103	68.2	0.050
	No	21	33.3	22	40.0	5	15.2	48	31.8	

*P value by χ^2 test

The majority of all groups are employed (68%).

The percent of employed is significantly higher in the Mainstream group 84.8% vs. 60%-67% in minority groups. (p=0.089 Passamaquoddy, p=0.017 Somali) .This is impacted by the location of their homes. Work is hard to come by both in Lewiston and in Washington Country in northern Maine.

Table 1.8: Living arrangement

	<i>Passamaquoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
	N	%	N	%	N	%	N	%	
City	2	3.6%	53	96.4%	9	33.3%	64	46.7%	<0.001
Suburbs	3	5.5%	0	0.0%	10	37.0%	13	9.5%	
Country	50	90.9%	2	3.6%	8	29.6%	59	43.1%	
	55		55		27		137		

*P value by χ^2 test

The majority of Passamaquoddy live in the country ($p < 0.001$ Fisher exact test). The majority of Somali live in the city, the Mainstream have no majority specified. Both minorities are significantly different than Mainstream, $p < 0.001$, Fisher exact test.

2. Culture:

Table 2.1: Traditions

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		<i>*P value</i>
		N	%	N	%	N	%	N	%	
Maintains Traditions**	Yes	50	84.7			22	68.8	72	79.1	0.104
	No	9	15.3			10	31.3	19	20.9	
Birth rituals	Yes	19	31.7	46	85.2	17	53.1	82	56.2	<0.001
	No	41	68.3	8	14.8	15	46.9	64	43.8	
Wedding	Yes	44	72.1	52	100.0	26	81.3	122	84.1	<0.001
	No	17	27.9	0	0.0	6	18.8	23	15.9	
Death rituals	Yes	57	90.5	54	100.0	26	81.3	137	91.9	0.007
	No	6	9.5	0	0.0	6	18.8	12	8.1	
Health	Yes	42	67.7	48	90.6	22	68.8	112	76.2	0.009
	No	20	32.3	5	9.4	10	31.3	35	23.8	
Culturally forbidden foods	Yes	3	4.8	52	94.5	1	3.1	56	37.6	<0.001
	No	59	95.2	3	5.5	31	96.9	93	62.4	
Keep religious objects	Yes	36	59.0	28	53.8	7	21.9	71	49.0	0.002
	No	25	41.0	24	46.2	25	78.1	74	51.0	
Consults spiritual leader	Yes	33	52.4	39	75.0	7	21.2	79	53.4	<0.001
	No	30	47.6	13	25.0	26	78.8	69	46.6	

*P value by χ^2 test

**The Somali didn't answer this question; therefore the comparison represents only Passamaquoddy vs. Mainstream. The Somali population maintains more traditional habits compared to Mainstream, $p < 0.02$ for all measurements.

Both the Passamaquoddy and the Somali have a significantly higher percentage of respondents that keep religious objects compared to Mainstream ($p < 0.001$ for both).

Both the Passamaquoddy and the Somali have a significantly higher percent of respondents that consult spiritual leaders compared to Mainstream ($p < 0.001$ for both).

Table 2.2.a: People that remain at home during the day

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Anyone stay at home during day	Yes	42	66.7	32	61.5	13	40.6	87	59.2	0.046
	No	21	33.3	20	38.5	19	59.4	60	40.8	
Due to illness?	Yes	22	38.6	7	13.5	2	6.5	31	22.1	0.000
	No	35	61.4	45	86.5	29	93.5	109	77.9	

*P value by χ^2 test

The Passamaquoddy have a significantly higher percent that remain at home compared to the Mainstream (p=0.017, Fisher exact test).

A significantly higher percentage of the Passamaquoddy stay at home due to illness compared to Mainstream (p=0.001, Fisher exact test).

Amongst the Somali, people stay at home but not due to illness. This is probably due to the extended family construct in which the elderly stay at home and care for the others, as is common in that culture.

Table 2.2.b: People that remain at home during the day according to age

		<i>P.quoddy</i>	<i>Somali</i>	<i>Mainstream</i>	Total	*P value
Minimal age	N	28	34	8	70	0.001
	Mean	13.6	3.4	10.3	8.3	
	Median	12	1.75	11	5	
	SD	10.0	4.2	5.7	8.6	
	SE	1.9	0.7	2.0	1.0	
	Min	0.1	0.3	2.0	0.1	
	Max	39	17	16	39	
Maximal age	N	36	36	12	84	0.009
	Mean	19.0	12.4	13.6	15.4	
	Median	17	13	18	14.5	
	SD	11.0	7.0	8.6	9.6	
	SE	1.8	1.2	2.5	1.0	
	Min	3.0	1.5	0.4	0.4	
	Max	46	26	26	46	

*P value by Anova

In the Somali group the minimal age is significantly lower than the Mainstream (p=0.031, Dunnett post-hoc test).

3. Emergency Preparedness

Table 3.1: Have you ever been involved in ...?

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		<i>*P value</i>
		N	%	N	%	N	%	N	%	
War	Yes	10	15.9	42	73.7	4	12.1	56	36.6	<0.000
	No	53	84.1	15	26.3	29	87.9	97	63.4	
Flood	Yes	14	22.2	7	12.5	7	21.2	28	18.4	0.353
	No	49	77.8	49	87.5	26	78.8	124	81.6	
Hurricane	Yes	40	63.5	2	3.5	18	54.5	60	39.2	<0.000
	No	23	36.5	55	96.5	15	45.5	93	60.8	
Earthquake	Yes	1	1.6	2	3.5	3	9.1	6	3.9	0.194
	No	62	98.4	55	96.5	30	90.9	147	96.1	
Terrorist attack	Yes	5	7.9	2	3.5	4	12.1	11	7.2	0.299
	No	58	92.1	55	96.5	29	87.9	142	92.8	
Car accident	Yes	50	79.4	7	12.5	27	81.8	84	55.3	0.000
	No	13	20.6	49	87.5	6	18.2	68	44.7	

*P value by χ^2 test

Involvement in floods, earthquakes and terrorist attacks: there are no significant differences between groups, and the majority was not involved in any of the above.

There are significant differences with involvement in war, hurricanes and car accidents.

The Somali have significantly different involvement than the Mainstream ($p < 0.001$,

Fisher exact test). The majority of the Somali were involved in war (73.7%) and weren't

involved in hurricane and in car accidents. The differences between Passamaquoddy and

Mainstream are not statistically significant. The Passamaquoddy have experienced

hurricanes (63.5%), while both the Mainstream and Passamaquoddy experienced car

accidents (~80%).

Table 3.2: Currently more prepared

	<i>Passamaquoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		<i>*P value</i>
	N	%	N	%	N	%	N	%	
Yes	29	47.5	24	44.4	21	65.6	74	50.3	0.140
No	32	52.5	30	55.6	11	34.4	73	49.7	

*P value by χ^2 test

The higher percent of Passamaquoddy and Somalis currently do not feel more prepared.

The

Mainstream (65%) does feel prepared; however differences are not statistically significant.

Table 3.3: Where would you go to get information?

		<i>Passamaquoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Friends	Yes	46	75.4	47	81.0	21	63.6	114	75.0	0.182
	No	15	24.6	11	19.0	12	36.4	38	25.0	
Neighbor	Yes	39	63.9	45	77.6	15	45.5	99	65.1	0.008
	No	22	36.1	13	22.4	18	54.5	53	34.9	
Family	Yes	52	85.2	51	87.9	24	72.7	127	83.6	0.153
	No	9	14.8	7	12.1	9	27.3	25	16.4	
Internet	Yes	17	27.9	22	37.9	28	84.8	67	44.1	<0.001
	No	44	72.1	36	62.1	5	15.2	85	55.9	
TV (Media)	Yes	40	65.6	36	62.1	26	78.8	102	67.1	0.250
	No	21	34.4	22	37.9	7	21.2	50	32.9	
Police/Army	Yes	36	59.0	29	50.0	18	54.5	83	54.6	0.614
	No	25	41.0	29	50.0	15	45.5	69	45.4	
No one	Yes	3	5.0	0	0.0	1	3.0	4	2.6	0.237
	No	57	95.0	58	100.0	32	97.0	147	97.4	
Everyone	Yes	25	40.3	14	24.1	7	21.2	46	30.1	0.071
	No	37	59.7	44	75.9	26	78.8	107	69.9	

*P value by χ^2 test

There are significant differences in the percent that will get information from the internet and from neighbors: The majority of the Mainstream group will gather information from the internet; a significantly higher percent than the Passamaquoddy and Somali ($p < 0.001$ for both, Fisher exact test). The majority of the Somali and Passamaquoddy will turn to friends, neighbors and family for information, a significantly higher percent of Somali will turn to neighbors ($p = 0.003$, Fisher exact test).

Table 3.4: Emergency Behaviors

		<i>P. quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		<i>*P value</i>
		N	%	N	%	N	%	N	%	
Have been informed how to behave	Yes	29	46.0	15	30.6	15	45.5	59	40.7	0.210
	No	34	54.0	34	69.4	18	54.5	86	59.3	
Family discussion on how to act	Yes	42	66.7	16	31.4	20	60.6	78	53.1	<0.001
	No	21	33.3	35	68.6	13	39.4	69	46.9	
Have family plans in case of emergency	Yes	26	41.9	16	29.6	17	51.5	59	39.6	0.114
	No	36	58.1	38	70.4	16	48.5	90	60.4	

*P value by χ^2 test

There are significant differences in the percentages between the communities that discuss how families should act; the majority of Somalis have not been informed on how to behave, don't have family discussions about emergency behavior ($p = 0.013$, Fisher exact test) and do not have family emergency plans.

The majority of the Passamaquoddy do have family discussions on emergency plans. The majority of the Mainstream was informed on how to behave during emergencies.

Table 3.5: Whom would you trust?

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Police	Yes	35	57.4	49	96.1	22	84.6	106	76.8	<0.001
	No	26	42.6	2	3.9	4	15.4	32	23.2	
Army	Yes	35	59.3	29	76.3	18	72.0	82	67.2	0.187
	No	24	40.7	9	23.7	7	28.0	40	32.8	
Politicians	Yes	4	7.0	8	26.7	4	16.7	16	14.4	0.043
	No	53	93.0	22	73.3	20	83.3	95	85.6	
Spiritual leader	Yes	39	63.9	38	92.7	10	40.0	87	68.5	<0.001
	No	22	36.1	3	7.3	15	60.0	40	31.5	
Your parents	Yes	38	66.7	41	95.3	22	91.7	101	81.5	<0.001
	No	19	33.3	2	4.7	2	8.3	23	18.5	
Your spouse	Yes	33	61.1	36	92.3	19	86.4	88	76.5	0.001
	No	21	38.9	3	7.7	3	13.6	27	23.5	

*P value by χ^2 test

Differences between Passamaquoddy and Mainstream:

Fewer Passamaquoddy than Mainstream a) trust the police (p=0.025) and b) trust the parents and the spouse (p=0.025, p=0.055). More Passamaquoddy than Mainstream trust a spiritual leader (p=0.056).

Differences between Somali and Mainstream: More Somali than Mainstream trust a spiritual leader (p=0.001).

Table 3.6: Government

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Feel U.S. government will take care	Yes	23	36.5	50	96.2	12	52.2	85	61.6	0.000
	No	40	63.5	2	3.8	11	47.8	53	38.4	
Received information from government	Yes	14	22.6	18	37.5	14	56.0	46	34.1	0.010
	No	48	77.4	30	62.5	11	44.0	89	65.9	

*P value by χ^2 test

The majority of the Somali group believe that the government will take care of them, compared to only 52.2% of the Mainstream ($p < 0.001$, Fisher exact test). Only 22.6% of the Passamaquoddy received information from the government compared to 56% of Mainstream ($p = 0.005$, Fisher exact test).

Table 3.7: Where do you go in case of emergency?

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Where government sends you	Yes	24	39.3	39	84.8	12	52.2	75	57.7	0.000
	No	37	60.7	7	15.2	11	47.8	55	42.3	
Family	Yes	51	86.4	46	100.0	20	90.9	117	92.1	0.037
	No	8	13.6	0	0.0	2	9.1	10	7.9	
Friends	Yes	49	83.1	43	95.6	18	85.7	110	88.0	0.142
	No	10	16.9	2	4.4	3	14.3	15	12.0	
Stay at home	Yes	47	79.7	4	19.0	8	40.0	59	59.0	0.000
	No	12	20.3	17	81.0	12	60.0	41	41.0	

*P value by χ^2 test

The majority of Passamaquoddy will stay at home (79.7%) and not go to where the government sends them, compared to 40% of Mainstream ($p = 0.002$, Fisher exact test). The majority of Somali (84.8%) will go where government sends them, compared to 52.2% of Mainstream ($p = 0.008$, Fisher exact test). The majority of all groups will go to family or friends.

Table 3.8: Emergency kits, hospitals?

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Have emergency	Yes	30	47.6	12	23.5	10	40.0	52	37.4	0.029

supply kit	No	33	52.4	39	76.5	15	60.0	87	62.6
Know where local hospital is	Yes	62	98.4	49	98.0	25	100.0	136	98.6
	No	1	1.6	1	2.0	0	0.0	2	1.4

*P value by χ^2 test

The majority don't have an emergency supply kit. The higher percent of people who don't have kits are the Somali, yet not significantly different than Mainstream. The vast majority ($\geq 98\%$) of all groups know where the hospital is located.

4. Risk perception

Table 4.1: General risk perception

		<i>P.quoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
Feel safe?	Yes	60	96.8	45	97.8	26	100.0	131	97.8	0.647
	No	2	3.2	1	2.2	0	0.0	3	2.2	
Feel prepared to deal with threats?	Yes	29	48.3	12	29.3	17	68.0	58	46.0	0.008
	No	31	51.7	29	70.7	8	32.0	68	54.0	

*P value by χ^2 test

The vast majority (>96%) of all groups feel safe.

The majority of Somali (70.7%) do not feel prepared to deal with threats, compared to 32.0% of Mainstream (p=0.004, Fisher exact test). Feeling safe may be explained from cultural aspects. The Somali, who are devout Muslims, believe everything is in Allah's hands and Allah decides one's fate.

Table 4.2: Specific Risk perception

		<i>Passamaquoddy</i>		<i>Somali</i>		<i>Mainstream</i>		<i>Total</i>		*P value
		N	%	N	%	N	%	N	%	
War	Yes	43	70.5	5	11.9	8	30.8	56	43.4	<0.001
	No	18	29.5	37	88.1	18	69.2	73	56.6	
Pandemic flu	Yes	33	54.1	3	7.7	7	26.9	43	34.1	<0.001
	No	28	45.9	36	92.3	19	73.1	83	65.9	
Fire	Yes	23	37.1	14	30.4	12	46.2	49	36.6	0.410
	No	39	62.9	32	69.6	14	53.8	85	63.4	
Hurricane	Yes	46	76.7	12	27.9	11	42.3	69	53.5	<0.001
	No	14	23.3	31	72.1	15	57.7	60	46.5	
Ice storm	Yes	52	83.9	26	59.1	18	69.2	96	72.7	0.017
	No	10	16.1	18	40.9	8	30.8	36	27.3	
Terrorist attack	Yes	41	67.2	11	24.4	11	42.3	63	47.7	<0.001
	No	20	32.8	34	75.6	15	57.7	69	52.3	

*P value by χ^2 test

Ice storms are the main risk for all groups.

The Somali feel less at risk than the Mainstream group; however differences are not statistically significant. Despite their past experiences, the Somali feel less at risk than the Passamaquoddy and Mainstream groups. The Passamaquoddy feel most at risk from nature, despite the fact they say they do not fear natural disaster. The Passamaquoddy feel significantly more at risk compared to Mainstream ($p < 0.05$, Fisher exact test) (except for fire and ice storm). The Passamaquoddy are afraid of war (70.5%), hurricane (76.7%), ice storm (83.9%), terrorist attack (67.2%) and pandemic flu (54.1%).

Model for identifying factors that affect subjective risk perception, thereby affecting preparedness.

A model of logistic regression was applied to identify which factors are related to subjective preparedness when dealing with risks. Therefore the dependent variable is subjective preparedness measured by the direct question, “Do you feel prepared ?” Yes/ No.

The independent variables were:

- Age – Continuous variable
- Gender – Female vs. Male. (Dummy variable Male is the reference category.)
- Risk perception – Calculation of the number of risks: No risk, Low risk (1-3), High risk (4-6). (Two dummy variables, the reference is no risk.)
- Culture – Representing the comparison groups. (Two dummy variables, the reference group is Mainstream.)

	Sig.	Odds Ratio	95% C.I. for Odds Ratio	
			Lower	Upper
Culture	0.005			
Passamaquoddy	0.157	2.2	0.7	6.9
Somali	0.001	10.3	2.5	42.4
Risk perception	0.033			
Low Risk	0.030	5.0	1.2	21.7
High Risk	0.009	8.0	1.7	37.8
Age	0.122	1.0	0.9	1.0
Female vs. Male	0.014	2.9	1.2	6.9
Constant	0.038	0.1		

The Somali are significantly less prepared than Mainstream, also after accounting for risk perception, age and gender. From the model it can be noted that the Somali group has an odds ratio of 10.3 compared to the Mainstream, meaning that the group is 10 times less prepared than the Mainstream. Female are less prepared than male (OR=2.9). People that feel “high risk” (4-6 risks) are less prepared than people that feel prepared.

CONCLUSIONS

The purpose of this research was to fill a gap in the data in this area by linking disaster preparedness behaviors with cultural variables within two minority communities in Maine and mainstream Mainers. Among the variables investigated were risk perception, proficiency, emergency behaviors, past experiences, social networks, communication networks, and cultural beliefs. Based on the analysis of the data, it is possible to pinpoint specific areas where intervention and training can be implemented to increase community preparedness levels. There are differences in the level of preparedness due to cultural variables that affect preparedness. Both of the minority communities I have researched have been marginalized, persecuted, and both have had their trust in their governments challenged at best. Both of these communities strongly maintain cultural traditions and beliefs. Cooperation among community members, policy makers, public disaster organizations and responders is crucial in the development of these programs.

Key Findings

There are significant differences between the Passamaquoddy and Somali, as compared to the Mainstream, when measuring variables that may link culture to preparedness. There are significant differences in English proficiency among the Somali, compared to the Passamaquoddy and Mainstream as seen in Table 1.6 and Figure 3. Over 60% of the Somali do not speak, understand or read English. Over 80% of the Somali and Passamaquoddy maintain traditional behaviors such as birth rituals, death rituals, and wedding rituals. Compared to the Mainstream, both the Somali and Passamaquoddy have a significantly higher percentage of the population that consults a spiritual leader (Table 2.1 and Figure 6). Both the Somali and Passamaquoddy populations were exposed to various risks in the past (war, ice storm), but neither feels more prepared should they

experience the same incident again (Table 3.2). When seeking information in a crisis, the majority of Somali and Passamaquoddy go to friends, family and neighbors; while the Mainstream go to the internet and media (Table 3.3 and Figure 8). The majority of the Somali have not been informed how to behave in emergencies, nor do they have family plans in case of emergency (Table 3.4).

In time of crisis, both the Passamaquoddy and the Somali would trust a spiritual leader more than politicians, whom they would not trust (Table 3.5). The Somali, however, feel that the government would take care of them in a crisis, whereas the Passamaquoddy feel the government would not take care of them in crisis (Table 3.6). The Passamaquoddy would remain at home rather than go where the government intends to send them in crisis. The Somali would follow government instructions to evacuate (Table 3.7 and Figure 9).

The Somali are significantly less prepared than the Mainstream, although only 54.3% of Mainstream is prepared. The Somali (78%) and the Passamaquoddy (69.8%) are objectively and subjectively less prepared than the Mainstream (45.7%) (Table 4.1 and Figures 10,11,12).

These data clearly offer new insight into the preparedness behavior of cultural minorities in emergencies, providing both internal and external validity across a broad spectrum of vulnerable populations, both within America and beyond its borders. The results of this study will be available to the Office of Minority Health in the State of Maine and to the Maine Emergency Management Agency in the hope that they will provide a building block toward the development of culturally competent disaster management plans – both in the two communities surveyed and in other underrepresented communities.

Talking to people and listening to their stories, letting them express their fears and their needs gave me insight into the issue these communities face, and can give rise to creative solutions that will best serve the people. This research has only touched the tip of the iceberg on the subject and much more remains to be done. Yet by continuing this project, we can offer an opportunity to rebuild and strengthen the ties between these communities and the mainstream that would help to ensure their proper consideration when developing plans. Policy makers and disaster managers who understand the concept of preparedness and its interaction with culture will be able to minimize risk and save lives. A benchmark database has been established for further studies. Baseline data identify emergent issues. The data support the hypothesis.

Recommendations

Improve community engagement. Emergency planners need to work with community gatekeepers in the Somali and the Passamaquoddy communities to develop local emergency plans. Discussion groups, lectures, development of family emergency plans are all methods that need to be addressed as possible ways to incorporate community members into the planning process. Family gatekeepers also need to be identified, as their role has a direct impact on preparedness given that it is they who receive, filter and disperse information. Ongoing risk mapping at a community level can identify vulnerable populations, including those that may need special services. A yearly updating of emergency plans will identify the needs of a changing population. Identifying specific problems in each community, such as lack of funds to buy emergency supplies or bad road conditions preventing access to and from the Pleasant Point reservation, should be addressed. Community engagement will not only help build community ties but will also minimize marginalization and the risk of personal and physical damage in case of disaster. Community engagement will provide vital information for policy makers and

emergency planners to improve the current system, which is presently suffering from lack of information on diversity in its own communities. Although it takes time to build relationships and trust within communities, in a democratic society it is expected that all populations in a community will be included in planning disaster management. The data collected from the two ethnic minority communities in Maine highlights the need to establish culturally specific disaster management plans for these populations, working from the community outward (as opposed to from the government downward) to investigate the needs of these cultural/ethnic groups and prove the need for culturally specific consideration when preparing these communities for disasters.

Information dispersion. A proactive communication strategy needs to be developed. For the Somali, information should be offered in Somali and Maay Maay; for the Passamaquoddy, in English and Passamaquoddy. Due to low access to the internet and lack of English proficiency, a communication tree (network) needs to be developed within the Somali community. Both a cultural tendency and limited proficiency in English tend influence individuals in the Somali community to seek information from unofficial places. Even with a superior networking system in place, language barriers may keep individuals from receiving the information they need. A radio station that broadcasts in Somali during emergencies would be beneficial. Loud speakers could also be used to ensure widespread dispersal of information in the community's native language for those that have Low English Proficiency. I strongly suggest that the women in the Somali community manage these communication networks. Empowering these women utilizes their superior networking abilities and will perhaps reduce the threat of domestic violence, which they have experienced in the past during crisis. The Passamaquoddy appear to have an effective internal communication networking system in place, yet it is important that information disseminated into their community come from a source they feel they can trust.

Simulation exercise. After developing a local emergency plan, a simulation exercise within the community would be beneficial to minimize the levels of stress and anxiety should a disaster occur. Such exercises emphasize the connection between emergency situations and risk reduction, and they introduce community members to the location of shelters, hospitals and other places of importance.

Funding. Both communities need to receive government funding that will provide food and supplies in emergencies, due to the fact they cannot afford to “buy food and not use it”. Additional funding is needed to provide emergency kits and supplies for each family. A location within each community should be identified to store canned food and water for the community. In addition to discussing and planning for realistic threats, discussions should be initiated within each community on the importance of a family plan.

Implications for the Future

The main implication for the future is that this study has added to the database supporting an important but overlooked (and often deliberately ignored) issue – the potential impacts of cultural competence/incompetence on the part of disaster response planners. Exercising cultural competence would dictate including these communities in the planning to save their lives and that it be recognized that they have the skills to help make those plans. The data collected here will help develop and implement effective and culturally competent protocols. In the future, a longitudinal study would be beneficial to evaluate the plan’s effectiveness.

The findings raise many questions for additional research on topics as wide-ranging as the involvement of women in planning (despite cultural barriers); the effectiveness of

communication after information has been translated; the effectiveness of pre-disaster preparation on these communities; the impact on relationships between mainstream and minority communities as a result of plan-building cooperation; and much more.

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