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Emergency Management Appropriations in Non-Event Municipalities

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Abstract

This study was conducted to discern if emergency management department appropriations in non-event municipalities increase after a major natural disaster. The literature written and research performed over the last decade suggested that a new emphasis on mitigation had resulted in increased collaboration and public support for disaster mitigation programmatically and financially. Conducting this research project entailed investigating if these non-event communities react by increasing their emergency management department (EMD) appropriations to prepare for future disasters. In exploring this question, it is important to convey how research has evolved on the subject of disaster funding, the importance of collaboration in disaster planning, and the economic fabric of federal, state, and local funding sources. The disaster selected as the intervention was Hurricane Sandy (referred to as Superstorm Sandy). Samples included large communities (greater than or equal to 50,000 residents) that maintain an EMD with a discernable and separate budget allocation within their governmental structure. This study examined the following hypotheses to answer the research question:

H1: Communities do react to the catastrophic disaster by increasing appropriations to EMDs.

H2: Location of the city and the Superstorm have an effect upon EMD budgets resulting in a statistically significant increase in EMD budgets before and after the Superstorm.

The conclusion, achieved after conducting a Paired t-test and Two-Way (Factorial) ANOVA and applying the Bonferroni Correction, was that communities in the United States probably do not adjust EMD budgets to increase preparedness after a major catastrophe strikes another community. Discussion of the results and future research opportunities follow.

Keywords: disaster resilience, emergency management departments, disaster planning

Introduction

Focusing on Federal Disaster Number 4085, New York Hurricane Sandy (Superstorm Sandy), cost US Taxpayers nearly \$15B in FEMA aid alone (FEMA, 2013), this research attempted to discern if such a catastrophic event acted as a catalyst for disaster preparation efforts in other municipalities. Estimates claim that the superstorm caused damage upwards of \$50B in property damage and was responsible for cataclysmic shifts in disaster management and relief (FEMA, 2013). Though media attention focused on the federal and state responses, the cameras rarely focused in on the contributions to success or failure of the reaction from local municipalities and their departments. In the wake of such massive storms and other hazards ranging from oil train explosions to landslides, to earthquakes, community preparedness has gained new traction in the fight to save not only dollars but also lives. In this fight, local governments are the first line of defense.

Disaster response and mitigation are increasingly becoming a topic of concern amongst funders, scholars, and civic leadership. Since 1996, the Public Assistance Grant Program has increased by 212% (Schroeder, 2016). In an age of retrenchment and growing reliance on nonprofit organizations or the private sector to provide public goods, this is a stunning figure. Climate change, looming significant natural hazards in the Pacific Northwest, superbugs, and terrorist attacks (both foreign and domestic) are on the minds of Americans. Akin to the federal government, municipalities face the dual function of maintaining a healthy community and preparing it for such hazards and emergencies that may lead to disaster. Although a plethora of research has been conducted to assess preparedness, resilience, and response across sectors, little (if any) had focused on financial appropriations to EMDs - the network of coordinators and officials who prepare for a disaster and execute the response. -

Many research papers examine the effects of disasters on economies, budgets, and suggest better ways to appropriate those funds. Relying on surveys and other qualitative data, previous studies

have secured a toehold into this realm, but identifying if quantitative answers could be found to explain how municipalities respond to and prepare for emergencies is a vital component of resilience and had not been adequately researched. This research picked up where the literature left off and attempted to discern, empirically, if EMD appropriations in non-event municipalities increase after a major natural disaster.

To analyze the appropriations, this research utilized financial data obtained from municipality annual budgets for EMDs in the three fiscal years before Superstorm Sandy and the three fiscal years after. Adjusting for inflation using the 2016 Consumer Price Index average annual rate of inflation, unattributed increases in the EMD as a percent of the total budget will be investigated and analyzed. This study assumed that factors such as collaboration, media frenzy, public discourse, and even fear contributed to the decision to increase appropriations to this critical department (though those elements will not be isolated and studied at length). Furthermore, this study did not measure the effectiveness of the appropriations concerning the resiliency of a municipality. This study aimed to find the trend, determine if it is statistically significant, and report the findings to identify and encourage further research. Interestingly, the results suggested that it is unlikely that a catastrophic disaster afflicting another municipality influences EMD funding in non-event communities. These results are discussed further, and new research opportunities that have been identified are discussed.

Definitions

In the review that follows, key terminology that will be highlighted include the following:

Coastal City – A municipality located where sea/ocean/bay transitions to a land mass. This includes cities that have access to the ocean via a major waterway (e.g., San Francisco, CA, Seattle, WA).

Inland City – A municipality with no access to the sea/ocean and is, essentially, “landlocked.”

Disaster Resilience – Measure of the ability of a community to survive and function in a disaster.

Disaster Mitigation – Actions taken to prevent an emergency from becoming a disaster.

Hazards and Emergencies - The "events" that may afflict municipalities but can be mitigated via resiliency measures to prevent a disaster.

Literature Review

In an increasingly urbanized and already coastal-centric society, it appears that the lessons of storms such as Hurricane Katrina or Superstorm Sandy are not resulting in change and research is now asking why. This study came to the same conclusions, even in communities that could suffer the same fate from the same emergency. However, modern scholarship placing vital importance on resiliency and EMDs increasingly include features such as Continuity of Operations Plans in their resiliency and preparedness assessments. Overall, the position of some researchers is that a shift is occurring: disaster response and recovery is giving way to an increased focus on resilience and preparation. Beginning in 1988, The Stafford Disaster Relief and Emergency Assistance Act was a pivotal moment for this change (Jackson, 2001). Despite this bill recognizing that preparedness is a crucial contributor to overall resilience, research conducted by Godschalk (1999) concluded that planning was still reactionary or if focused on resilience, undertaken haphazardly. Instrumental in a further shift towards disaster resilience was the Disaster Mitigation Act of 2000 which provided FEMA with the ability to address mitigation through regulatory requirements to be imposed upon a state, local, and tribal governments. Again, despite this bill, Donahue and Joyce (2001) and Phaup and Kirschner (2010) observed that response, and not planning, were the primary focus of numerous communities.

Though Hildreth (2012) argues that disasters such as Hurricane Katrina or Superstorm Sandy are outliers and no amount of planning can buffer a community from them, mitigation reduces not only the probability of an emergency becoming a disaster but the recovery and rebuilding expenses incurred. It is difficult to measure the costs, material or abstract, of a disaster and the relationship an event such

as Hurricane Katrina or Superstorm Sandy has on mental health or corporate relocations. It simply may never be known. However, relying on response over mitigation is a questionable policy practice as FEMA does not merely hand out grants to afflicted communities but reimburses expenses to communities (Hildreth, 2012, p. 404). This approach requires municipalities to maintain a cash reserve to prevent an emergency from turning into a disaster (Phaup & Kirschner, 2010). Furthermore, the practice of issuing reimbursements highlights the importance of this study: determining if preparedness exists at the financial level. Though Krueger, Jennings, and Kendra (2009) evaluated county budgets in an attempt to discern if that financial buffer existed, the study attempted to objectify past events through the assessment of Public Entity Risk Institute data. As admitted in their conclusion, this approach proved to be unreliable for two reasons. First, measuring the data as a total spent on a disaster area with no separate reports for affected municipalities was ineffective. Second, the dataset utilized a national focus, and the researchers could not untangle local budgets and expenses from the dataset. Hence this research project's focus on municipalities with identifiable departments and budgets.

Policy diffusion and Collaboration in Disaster Mitigation

Partnerships and collaboration are stressed in the emergency management literature because EMDs are small in comparison to other departments within the government. Research shows that EMDs are both more efficient and effective when agencies (EMD to EMD or EMD to another body) collaborate within their governments and across municipality boundaries (Moss, Schellhamer, & Berman, 2009). Why is this believed and how did this study attempt to investigate this? First, utilizing a well-known and current event that takes into consideration the harsh lessons learned from previous catastrophic and modern disasters. Second, there is a plethora of data, media coverage, and political debate available thanks to the emergence of Social Media; these catastrophic events are well documented and have affected not just the local population, but also the American psyche. Noting this,

the essential relationships that developed and solidified between various actors should have resulted in increased appropriations in communities that saw no harm but feared the outcome when an emergency turned into a disaster on their doorstep. This research helped identify that this may not, in fact, be the case.

Shipan and Volden's (2008) study concluded that policy diffusion is a reality and that policy decisions result from a series of influences that act to shape legislative action. Crucial to understanding how a disaster in one community may affect the financial planning in another, it was determined that governments learn from each other and that diffusion crosses geographic and political boundaries (pp. 2-3). Those relationships, thus, should be present and observable in the financial data this study will research. Though some collaboration is to be expected, the degree to which this affects EMDs has not been thoroughly investigated (Kapucu & Garayev, 2011). Resilient systems reduce the probabilities of failure, the consequences of failure (such as deaths and injuries, physical damage, and adverse economic and social effects), and the time for recovery (GFOA, 2008). Setting aside additional funds in a non-event city suggests a municipality recognizes threats, responds by increasing appropriations, and thus focuses on resiliency and not response. It was hypothesized that a community would ensure agencies are funded, prepared for, and ready to respond to a similar event. It is important to recognize that the researchers, as mentioned earlier, measured collaboration in non-event municipalities and isolated it as a factor contributing to preparation. Collaboration (a preferred and essential aspect of disaster readiness, preparation, and relief) includes a key component: past experiences (McGuire & Silvia, 2010, p. 294). Collaboration and experience are intertwined, and this research has shown that this, at least, is not reflected in the budgets of the EMD departments.

Methodology

This study aimed to answer the question, “do emergency management department appropriations in non-event municipalities increase after a major natural disaster?” Answering this research question required analyzing the financial information available as a component of overall budgets within each municipality. It was approached by looking at all municipalities and their location (inland or coastal). As such, the dependent variable is EMD budget trend (as a % of total budget) in each municipality. The independent variables are Location and Superstorm Sandy. This research hypothesized that an upward trend will appear in the sample set and that it will be statistically significant. The literature cited inferred that this outcome was possible as the literature reflects that shared experiences and lessons contribute to planning and preparation. There was not aggregated data set of EMD and city budgets available, and one was constructed.

As such, attention to detail was crucial to ensure the integrity of the data was maintained. Each municipality’s budget data were double checked, and outliers or failed data entry corrected before analysis was conducted. Though time-consuming, it was necessary.

Population of Interest

The population of interest is communities within the United States that possess $\geq 50,000$ residents and are independent municipalities. Initially, this study desired to focus on cities $\geq 100,000$, but the insufficient sample size was a risk. Excluded are county, special district, and other forms of government. Utilizing the Fact Finder database of the US Census Bureau, this now includes upwards of 800 incorporated municipalities. This dataset comprises the count from the 2010 census and estimates population as of July 1st of 2016.

Sampling and Selection

Conducting the research required gathering financial data via the budget reports of each municipality sampled for three years before Superstorm Sandy and three years after Superstorm Sandy utilizing a before and after two-group design and a combination of non-random assignment via matching and randomized assignment. This study collected samples from nearly 800 municipalities identified by the Census Bureau with populations exceeding 50,000 individuals (estimated) for 2016. Within that data set, each city was assigned a random decimal number between 0 and 1, generated by Excel, and sorted ascending from 0 - 1. Starting from the first entry, a city was selected if it a) Did not receive individual and public assistance from FEMA in the aftermath of Superstorm Sandy b) Maintained an EMD or identifiable emergency management division of another department and c) Had a separate line item for budget expenses for that EMD or division in the city budget (Figure 1):

1	Number	City	EM DM	DataM	Sandy?
2	0.0033856220	Lexington, Kentucky	Y	Y	N
5	0.0086079420	Baltimore city, Maryland	Y	Y	N
9	0.0165487300	Huntsville city, Alabama	Y	Y	N
15	0.0234340800	North Las Vegas city, Nevada	Y	Y	N
22	0.0294981520	Mesquite city, Texas	Y	N	N
25	0.0329673220	Columbus city, Georgia	Y	Y	N
27	0.0380024470	Ann Arbor city, Michigan	Y	Y	N
31	0.0401591310	Sandy city, Utah	Y	Y	N
33	0.0403584750	Edmond city, Oklahoma	Y	Y	N
34	0.0417345840	Pico Rivera city, California	Y	Y	N
35	0.0480629200	Aurora city, Illinois	Y	Y	N
38	0.0547125570	Galveston city, Texas	Y	Y	N
40	0.0581011750	San Francisco city, California	Y	Y	N
44	0.0607553340	Compton city, California	Y	Y	N
45	0.0630188240	Mount Vernon city, New York	Y	N	N

Figure 1. Sampling Method. This screenshot shows the municipality selection process. “Number” is the random number generated by Excel, “City” is the City, “EM DM” refers to the presence of an EMD, “Data” refers to the availability of budget data available for the EMD, and “Sandy” refers to

the disbursement of individual and public assistance. If all conditions were met (conditions highlighted in green) the city was selected to be part of the study.

With these criteria established, 30 cities that are inland and 30 cities that are coastal were selected for inclusion in this study. Their budgets for FY11-16 were retrieved and analyzed. To account for inflation, the dollar amounts for each Fiscal Year were adjusted to 2016 US dollars utilizing the average annual CPI calculation available from the Bureau of Labor and Statistics. The overall budget used for the ratio included all budgeting funds, and the EMD budget was divided by this to attain the % of budget ($\% \text{ of Total Budget for FY} = \text{EMD Budget} / \text{Overall Budget}$). EMDs with a budget but were eventually shuttered or EMDs that were started between FY 11 and 16 were included. These were considered important to include since they suggest a city learned from or did not learn from a disaster. The % of Total Budget was then calculated for each FY and grouped into pre-Sandy and post-Sandy means. Due to the results from real-world departments failing tests of normality, a LOG10 calculation was utilized to adjust the means. Though the testing utilized is robust against the violations of normality, this adjustment achieved normality. Due to multiple hypotheses being tested and an increased chance of a rare event occurring, a Bonferroni correction of ($\alpha_{\text{altered}} = .05/2 = .025$) was applied, though even with this conservative approach, none of the results were statistically significant ($p > .05$ in all tests).

Superstorm Sandy made landfall on October 29th of 2012 – near the beginning of FY13 (2012-2013). Thus, a time lag would occur as the budget for that year would have already been finalized. Fiscal Year planning could not account for any possible effects of Superstorm Sandy in budget considerations until FY14 (2013-2014) and this detail was accounted for. Each municipality was reviewed to ensure their Fiscal Year adopted appropriations address the pre and post event

correctly: FY11-FY13 | FY14-FY16 (i.e., City 1's pre-Sandy budget is not placed into Post Sandy observations based upon the calendar year alone- Refer to Figure 2).

	B	C	G	H	I	J	K	L
1	City	State	FY11	FY12	FY13	FY14	FY15	FY16
2	Anchorage	Alaska	\$1,640,631.00	\$1,587,412.00	\$1,480,278.00	\$1,636,572.00	\$1,516,202.00	\$1,426,364.00
3	Ann Arbor	Michigan	\$114,463.00	\$129,531.00	\$152,661.00	\$134,410.00	\$139,911.00	\$134,661.00
4	Baltimore	Maryland	\$216,793.00	\$231,765.00	\$510,071.00	\$594,415.00	\$645,842.00	\$1,011,421.00
5	Boston	Massachusetts	\$311,392.00	\$311,392.00	\$311,392.00	\$436,754.00	\$465,583.00	\$706,117.00
6	Charleston	South Carolina	\$320,873.00	\$348,728.00	\$361,846.00	\$411,406.00	\$487,212.00	\$471,963.00
7	Chesapeake	Virginia	\$230,471.00	\$295,939.00	\$320,259.00	\$331,186.00	\$349,139.00	\$336,547.00
8	College Station	Texas	\$247,668.00	\$246,899.00	\$247,513.00	\$251,359.00	\$248,957.00	\$258,326.00
9	Columbus	Georgia	\$170,050.00	\$173,230.00	\$173,249.00	\$187,756.00	\$185,053.00	\$179,302.00
10	Corpus Christi	Texas	\$322,029.00	\$392,445.00	\$447,350.00	\$452,654.00	\$469,188.00	\$499,066.00
11	Dallas	Texas	\$904,781.00	\$908,644.00	\$942,012.00	\$901,125.00	\$1,000,606.00	\$621,618.00

Figure 2. City Data Example. This figure is a screenshot of a portion of the captured budget data.

Adopted appropriations (rather than amended or actual) were selected for review and analysis because they are the planned budgets based on past experience and a municipality's best guess about the next fiscal year's revenues and expenditures.

Issues for Consideration

Threats and reliability.

The purpose of this study was not to control for every possible nuance. It was a stepping-stone to more nuanced research. As the Literature Review conveyed, there have been no significant studies attempting to isolate any trends in financial data in non-event cities. Determining if there is an uptick after a disaster will answer the question if non-event cities increase their budgets in an attempt to mitigate a disaster that may afflict them in the future. Thus, this study acts as a springboard into other research topics. Additionally, this study did not measure if an increase (if discovered) is utilized efficiently or effectively.

Additional Population Areas

This study focused on municipalities and did not account for unincorporated areas, county level management, and cities with less than the stated population. In some areas of the United States, County level EMDs are the primary connection between people and State/Federal agencies.

History Threat

The use of trend analysis and the selection of numerous municipalities addressed for this. Additionally, the design of the study limited the effects of other influences on appropriations.

Selection Threat

A selection threat does exist, as elected officials and appointed administrators drive budget decisions. Their political differences and personal experiences could influence how money is appropriated and expended.

Municipalities with No Discernible Budgets

Some cities on selected randomly from the 800 city population did not have discernible budgets, EMDs, or failed to meet other criteria for this test. They were removed and the next city on that list evaluated for inclusion or removal.

Municipalities with Closed/Opened EMDs

These were included since the act of funding, or defunding a department, contributed to the objective of this study. Namely, a lesson learned or not.

Results

H1: Communities do react to the catastrophic disaster by increasing appropriations to EMDs.

A paired-samples t-test was conducted to compare the mean of municipalities EMD % of the budget before Hurricane Sandy and after Hurricane Sandy. There was not a significant difference in the scores for Mean Before ($M = -3.0523$, $SD = .52372$) and Mean After ($M = -3.0087$, $SD = .55403$) conditions; $t(59) = -.848$, $p = .400$.

The results suggest that a major natural disaster afflicting the United States has no effect on the overall EMD budgets of municipalities.

Paired Samples Test									
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	LogMeanBefore - LogMeanAfter	-.04361	.39860	.05146	-.14658	.05936	-.848	59	.400

Figure 3. Results. SPSS output of results.

H2: Location of the city and the Superstorm have an effect upon EMD budgets resulting in a statistically significant increase in EMD budgets before and after the Superstorm.

A two-way analysis of variance was conducted on the influence of two independent variables (Location of City and Hurricane Sandy) on the EMD budget of non-event municipalities. Location of City consisted of two types (Coastal, Inland) and Hurricane Sandy two types (Before, After). All effects were not statistically significant.

The main effect for Location of City yielded an F ratio of $F(1,118) = .86$, $p = .357$ indicating no significant difference between Coastal ($M = -2.9853$, $SD = .58858$) and Inland ($M = -3.0747$, $SD = .47341$). The main effect for Hurricane Sandy yielded an F ratio of $F(1,118) = .20$, $p = .659$ indicating no significant difference between Before Hurricane Sandy ($M = -3.0520$, $SD = .51512$) and After Hurricane Sandy ($M = -3.0307$, $SD = .53284$). The main interaction effect for Location of City and Hurricane Sandy yielded an F ratio of $F(1,118) = .53$, $p = .468$ indicating no significant difference between the effects of Location of City and Hurricane Sandy on the budgets of EMDs ($M = -3.0307$, $SD = .53284$).

The results suggest that a major natural disaster afflicting the United States has no effect on the overall EMD budgets of non-event municipalities and their location plays no statistically significant role.

Tests of Between-Subjects Effects

Dependent Variable: Log Budget

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.449 ^a	3	.150	.521	.668
Intercept	1119.362	1	1119.362	3895.813	.000
Location	.246	1	.246	.857	.357
Hurricane	.056	1	.056	.196	.659
Location * Hurricane	.152	1	.152	.529	.468
Error	33.904	118	.287		
Total	1154.967	122			
Corrected Total	34.354	121			

a. R Squared = .013 (Adjusted R Squared = -.012)

Figure 4. Results. Results of the factorial ANOVA (two-way analysis of variance).

Overall, it was determined that emergency management department appropriations in non-event municipalities probably do not increase in response to a major natural disaster.

Issues with the Findings

There were three concerns encountered during this study. One was the presence of confounding variables that could afflict budget decisions. Issues of politics and personal beliefs that, without qualitative research, could not be controlled. Grants and a municipality's reliance upon them to fund an EMD were not measured and would be difficult to isolate and control. Once a grant was issued, it would be difficult to ascertain how that money was utilized in budgets since few had line item accounts, merely budget summaries. Though these two concerns are present, the study utilized multiple approaches (percentage of the budget for all funds instead of only the general fund; a three year before and after trend rather than comparing individual fiscal years) to account for these concerns.

Finally, normality violations were encountered, and a Log10 correction in SPSS was utilized to correct for this. This correction made the patterns more discernable and interpretable (Quackenbush,

2002). Though the tests utilized are robust against the violations of normality, this method was still used to ensure the tests run would be viable and conclusions reliable.

Significance of Findings

As disasters continue to increase in rapidity, financial loss, and property destruction, it is crucial to understand how much influence a disaster has on communities and if the relationships, collaboration, planning, and mitigation are observable via funding data. Local governments are the first responders and act not only to prepare for an emergency but also to keep that emergency from becoming a disaster. Phaup and Kirschner (2010) convey that:

Government policy can increase long-term well-being in the face of disasters. Those gains, however, depend primarily on the effects of policy on public and private decisions before the disaster occurs. Ex-ante budgetary policies can increase net benefits by providing fiscal incentives and legislative opportunities to improve national savings, reduce exposure to risk, and promote mitigation, before the loss event. (p. 2).

The study conducted does not disagree with what Kirschner (2010) suggests, though it does conclude that governments are not implementing that policy through their EMD departments (if at all). Further research is required to ascertain the motivation behind this and if EMD departments are, in fact, mitigators or merely responders.

Suggested Future Research Applications

Though the results proved surprising, especially considering that location played no role in the decision to change EMD budget, additional research is possible and warranted. Three avenues were identified to follow to determine how municipalities prepare for and learn from disasters: A qualitative study of actors, a study of reimbursements from state and federal agencies to local governments, and a study to measure if EMDs are spending money on mitigation at all or merely response.

Qualitative Study of Actors and Stakeholders

A qualitative study should be conducted to ask EMDs, city officials, and other administrators the reasoning behind their budget decisions. Reviewing much of the documentation after the study concluded, it is possible that mitigation and preparation are seen elsewhere. A city council may decide, for example, that the Public Works department should receive extra funding to shore up sewage facilities in case of flooding. This decision, and the process behind it, would be impossible to discover from quantitative data alone. Furthermore, disaster planning and response could suffer from a “kick the can” mentality that results in the departments only being viable resources during the disaster, not before it. Thus, a qualitative study to investigate why the results this study generated occurred is a critical next step to understanding the complexities of budgets, relationships, collaboration, and disaster resiliency.

Study of Reimbursements

Alarming, due to the reimbursements provided by State and Federal Agencies, local level governments could see no need to provide additional funding to their own EMDs. There may exist a need to spend tight budgets on other projects or concerns and local authorities merely rely on the state or federal emergency management agencies to provide the funding needed to recover. This policy would be a worrisome observation to confirm and is worthy of researching further. As the literature review suggests, much of disaster mitigation relies on planning. If planning is forsaken in the name of city operations, the cost to the taxpayers to recover could be exponentially higher than if planning and mitigation were adequately funded. Additionally, there is no guarantee a state or federal agency can help a community recover entirely.

EMD Spending Habits

Many websites visited during the data collection phase of this study suggested that EMDs hold a wide range of responsibilities and missions - from something as simple as providing online resources to as complicated as maintaining tornado bunkers and early warning systems. - How EMDs spend or utilize their budgets was impossible to discern from the budget documents alone. One current trend, reported by Chen, Chen T., Vertinsky, Yumagulova, & Park (2013) suggests their budget could be spent on contracts and partnerships between government, nonprofit, and private organizations aimed at increasing local resilience and recovery. It is also entirely possible money earmarked for disaster resiliency was spent by other departments (and never went through the EMD) on similar contracts or infrastructure projects. In either case, a combination of a qualitative and quantitative study could provide insight into how, and why, EMDs utilize their budgets and if EMDs are responsible for recommending budget items for other departments as part of overall resiliency.

Collaboration Research

An additional research route using this data set involves investigating the correlation between budget approval and end of fiscal year actual. The budget data utilized for this study focused entirely on the approved budget. The argument for this was an approved budget, rather than an amended or actual budget results, would best represent a community in the planning phase. An amended or actual budget would suggest a response to conditions within that community. Some budgets reviewed suggested that, despite end of year expenses in excess of approved budgets, the EMD saw no increase in budget the following year, instead having drawn upon reserve funds or emergency appropriations to see it through the year. Why these municipalities reacted in this manner and elected not to improve the budget appropriations the following year could prove a rewarding endeavor to research.

Further Considerations

If disaster preparation and mitigation research presently rely on examining the relationships between an event and the response of government agencies, that approach should be reexamined. It is entirely possible that preparation and mitigation planning and funding are intertwined in a series of complex systems that are not understood. These systems could include decisions and flows that result in increased funding to various departments, staff restructuring, outsourcing, and redevelopment, none of which are examined in depth. Does a road work project include new flood control measures count as disaster mitigation? How is this measured, and is it a valid measure, of a community's resilience? Does an EMD play any role in shaping how this project was designed and funded? These are all questions that must be addressed if disaster planning is to be fully understood, measurable, and efficient.

As this data set is new, it could prove vital to the examination of these questions. Data collected by this study could allow future researchers to examine the suggested additional courses of research as well as construct new research projects to answer lingering questions surrounding communities and their ability to prevent an emergency from leading to a disaster via resiliency and mitigation practices.

Conclusion

Though one often conjures up sandbags and boarded up windows when one thinks of preparation, communities must also consider operating expenses to keep public buildings open as shelters, paying overtime to employees directing evacuation traffic, and additional police officers and patrols to prevent looting. The importance of a rainy-day fund and proper planning for these situations need no further explanation, and this research provides cause for alarm since the connection between a community's needs, government policy, and funding EMDs to prevent an emergency from becoming a disaster is probably not occurring. Though there are some exceptions, most municipalities do not appear to change course when disaster afflicts their neighbors.

Responsible policy and budgets focus not only on disaster response and recovery but mitigation. These policy assumptions suggest that as municipalities, states, and the federal government continue to react to ever increasingly catastrophic natural disasters, they spend more money on preparation, planning, and mitigation. However, the results suggest the opposite. Spending is not trending upwards in the immediate aftermath of a significant event. The expense could be seen elsewhere, as suggested, but no research has been undertaken to determine if that is the case and to what extent EMDs figure into the equation. In non-event cities, this study suggests that EMDs are not essential departments and funding is barely keeping up with inflation rates, let alone increasing exposure to emergencies and aging infrastructure to prevent disaster. Additional research is not only necessary, but vital to unravel and measure the complex relationships between local, state, and federal emergency management agencies and the ability of a community to remain resilient or recover when disaster strikes.

References

- Chen, J., Chen, T. H. Y., Vertinsky, I., Yumagulova, L., & Park, C. (2013). Public-private partnerships for the development of disaster resilient communities. *Journal of contingencies and crisis management*, 21(3), 130-143.
- Donahue, A. K., & Joyce, P. G. (2001). A framework for analyzing emergency management with an application to federal budgeting. *Public Administration Review*, 61(6), 728-740.
- FEMA. (2013). *Hurricane Sandy FEMA After-Action Report*. Washington, DC: U.S. Government Printing Office.
- GFOA. (2008, October 01). Disaster Preparedness. Retrieved December 01, 2017, from <http://www.gfoa.org/disaster-preparedness>
- Godschalk, D., Beatley, T., Berke, P., Brower, D., & Kaiser, E. J. (1998). *Natural hazard mitigation: Recasting disaster policy and planning*. Island Press.
- Hildreth, W. B. A. (2009). The financial logistics of disaster: The case of Hurricane Katrina. *Public Performance & Management Review*, 32(3), 400-436.
- Kapucu, N., & Garayev, V. (2011). Collaborative decision-making in emergency and disaster management. *International Journal of Public Administration*, 34(6), 366-375.
- Krueger, S., Jennings, E., & Kendra, J. M. (2009). Local emergency management funding: An evaluation of County Budgets. *Journal of Homeland Security and Emergency Management*, 6(1).
- McGuire, M., & Silvia, C. (2010). The effect of problem severity, managerial and organizational capacity, and agency structure on intergovernmental collaboration: Evidence from local emergency management. *Public Administration Review*, 70(2), 279-288.
- Moss, M., Schellhamer, C., & Berman, D. A. (2009). The Stafford Act and priorities for reform. *Journal of Homeland Security and Emergency Management*, 6(1).

Phaup, M., & Kirschner, C. (2010). Budgeting for disasters: focusing on the good times. *OECD Journal on Budgeting*, 10(1), 21.

Quackenbush, J. (2002). Microarray data normalization and transformation. *Nature genetics*, 32, 496.

Schroeder, I. (2016). We Don't Know How Much We Spend On Disasters, and That Needs To Change. *The Pew Charitable Trust Online*. Retrieved from <http://pew.org/2fxOo8g>

Shipan, C. R., & Volden, C. (2008). The mechanisms of policy diffusion. *American journal of political science*, 52(4), 840-857.