Wave 2B: Complex Event Resilience– SME Recovery from a Pandemic in the Face of Natural Hazard Risks

Business Recovery/Continuity Collection

U.S. Department of Commerce
National Institute of Standards and Technology
Generic Clearance for Community Resilience Data Collections
OMB CONTROL NO. 0693-0078
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For each proposed request using this generic clearance, NIST will submit the actual instrument and related documents (letters, emails to respondents, scripts, etc.), as well as proposed statistical methods to be employed to OMB along with responses to the following questions:

1. Explain who will be surveyed and why the group is appropriate to survey.

The purpose of this research is to build a dataset that allows longitudinal documentation of (1) the novel resilience-based mitigation actions employed during the COVID-19 pandemic by small- and medium-sized enterprises (SMEs) by sector, (2) challenges in implementing resilience-based mitigation actions, (3) utilization of past strategies and approaches to provide assistance to the current situation, and (4) planned resilience actions and strategies.

A first wave of data collection took place July-August, 2020 using the Wave 1 "Compound Risks – SME Recovery from a Pandemic in the Face of Natural Hazard Risks" electronic survey instrument. 1,374 valid survey responses were collected from eligible SME owners and managers. The SME stakeholders (e.g., owners and managers) to be surveyed in this collection constitute a refreshment sample to allow for a larger initial dataset for future longitudinal studies.

The United States' 30 million Small and Medium Enterprises (SMEs) make up 44 % of economic activity and employ nearly 60 million people. The importance of this research is its timely collection of data that allows for analysis of: (1) resilience planning for natural disasters under constraints (e.g., pandemic), including why SMEs may or may not adopt a given resilience-based mitigation or coping strategy and (2) how experience with natural disaster mitigation informs successful strategies for coping with the pandemic. Given that responses to COVID-19 disruption by SMEs, government, and other entities are expected to continue in the near term, quickly understanding the evolving needs of SMEs and reflecting how businesses are learning and responding to these types of events, especially those defined by deep uncertainty, is pertinent.

There is minimal primary data on business interruption following a large-scale natural hazard event, especially in the period of mid-term recovery. Furthermore, to the best of our knowledge, there is no primary data on planning for natural hazard resilience during a pandemic, which is highly relevant at a time when much of the US faces potential natural disasters as SMEs are still

under duress from the COVID-19 pandemic. The opportunity to obtain this type of longitudinal data related to SMEs' complex event experiences is extremely novel. There is critical value to this data, as we seek to better understand how SME managers and owners make decisions when facing complex events – both considering them as potential future events and addressing them when they occur.

At this point in time owners and managers are more likely retain information about direct impacts and adaptation activities to address the impacts of COVID-19 and plans for dealing with natural hazards (that may have occurred since mid-March or will in the near-term) that can be meaningfully recorded and collected for data analysis.

This collection instrument will be answered by owners and managers of SMEs in sectors not covered in the original data collection. A focus will be on garnering information from SMEs in North American Industry Classification System (NAICS) codes 54 (Professional, scientific, and technical services) and 72 (Accommodation and food services). These are sectors largely impacted by COVID-19-related restrictions. Furthermore, NAICS Code 54 has the greatest number of minority-owned SMEs and Code 72 accounts for the greatest number of minority employees at SMEs. Given the likelihood of attrition in future data collections from the initial respondents, increased baseline responses are critical at this juncture. Those to be surveyed covers businesses that are located in places sensitive to natural hazard events; it is composed of both SMEs that have and have not experienced a natural hazard during the period of COVID-19 transmission.

At each establishment, one individual familiar with the recovery efforts will be surveyed — either (1) the owner or (2) the manager (in some cases the same individual will both own and manage a business). In cases where there is the potential to have both the owner and manager complete the survey, it is preferable to survey the individual who owns the business since this person is likely to know the most about the history of the business and the full recovery process.

This data collection is expected to obtain approximately 1,200 business responses. It is notable that given the extent of COVID-19, it is expected that all SMEs surveyed will have been affected in some fashion by COVID-19-specific impacts. Furthermore, given the extent of the natural disasters occurring since the start of August 2020 and on-going, it is expected that more respondents will have experienced a natural disaster in the past months since the first wave of data collection.

Each SME approached to respond to this online survey employs 250 or fewer individuals at a given geographic location. If the business has more than one location, the respondent will be directed to respond for a single SME location. The SMEs have provided permission to be contacted for this survey.

The process of data collection and the findings of this wave of data will be socialized throughout relevant communities, through stakeholder engagement. Notably, the NIST Associate Director for Laboratory Programs (ADLP) has approved this data collection proposal as a means by which to engage with counterparts in appropriate Federal agencies, such as FEMA, SBA, and EDA, to appropriately frame and provide guidance to SMEs.

2. Explain how the survey was developed including consultation with interested parties, pretesting, and responses to suggestions for improvement.

This survey instrument was developed by the NIST Applied Economics Office (AEO) in the Engineering Laboratory (EL). This instrument incorporates lessons learned from the Wave 1 collection during summer 2020. The main structure of the instrument follows the Wave 1 "Compound Risks – SME Recovery from a Pandemic in the Face of Natural Hazard Risks" survey instrument as well as a business survey that the AEO developed for use in South Carolina and Texas post-Hurricanes Irma and Harvey. In that sense, many of the questions have been thoroughly vetted in the field, as has the proposed data collection methodology (e.g., use of an electronic data collection).

Federal agencies that provide disaster assistance and best practice guidance to SMEs are often unaware of the range of mitigation and coping strategies SMEs adopt, particularly when adapting to new stresses. Yet, such information is critical to defining relevant and appropriate guidance in a changing business environment. In the current situation of government-mandated restrictions and closures, supply-chain disruptions, and loss of employees, customers, and revenue, SMEs face additional challenges in preparing for and responding to natural hazards. The National Oceanic and Atmospheric Administration (NOAA) recorded one of the busiest Atlantic hurricane seasons ever in 2020. This appears to be an ongoing trend with four of the five most expensive years on record for weather and climate related disasters in the U.S. have occurred in the past four years, causing more than US$59 billion in direct losses (NOAA, 2020).
It is not clear how multiple or simultaneous risks (i.e., risks derived from concurrent events, such as natural hazards during a pandemic period) will influence the resilience capacity and the recovery of SMEs.

The AEO in NIST's Engineering Laboratory EL has drafted this survey instrument to address complex event risk from COVID-19 and potential natural hazards. There is consideration made for persistent stressors and other SME concerns as well. Input and review has been made by Federal partners (e.g., SBA, NOAA Climate Program Office, NOAA Sea Grant, NOAA Weather Ready Nation (WRN), NIST Manufacturing Extension Partnership (MEP)). These Federal partners will continue to collaborate with NIST AEO to develop a better understanding of business disruption/continuity patterns from extreme events (e.g., hurricane, floods, fire) in the face of a pandemic and in turn provide actionable guidance and assistance to the SMEs they serve.

During development, the survey instrument was also reviewed by academics who conduct boots-on-the-ground research in these areas. This iterative collaboration created a relatively brief and thorough tool that can be accessed online to collect sources of business interruption and how recovery (short- and long-term) were sought, as well as reasonable longitudinal metrics towards recovery and adaptive learning.

Several best practices and lessons learned have been implemented in this tool that emerged from review of the business continuity survey that NIST took part in post-Hurricanes Irma and Harvey

that are applicable to this proposed business interruption survey tool. Furthermore, a literature review of the business interruption literature for natural hazards, pandemics, and complex event risks was carefully curated and reviewed during development of the survey tool.

3. Explain how the survey will be conducted, how customers will be sampled if fewer than all customers will be surveyed, expected response rate, and actions your agency plans to take to improve the response rate.

The survey will be conducted online using the SurveyMonkey interface to obtain a refreshment sample to supplement the baseline data for a novel longitudinal dataset.

The initial sample will be drawn from locations that regularly experience natural hazard events (Group 1). We have a large verified list of SMEs in the US through U.S. Business Data and Dunham Bradstreet records. In this survey, government agencies and medical offices will be excluded. The supplemental sample will come from public outreach for volunteers (Group 2). Partners, such as the NIST Manufacturing Extension Partnership, will reach out through their networks to provide increased awareness of the survey effort. Furthermore, if response rates are low an advertisement through social media may be placed to let SMEs know about the effort; no remuneration for participation will be offered.

This survey will take a maximum of 15 minutes to complete. The response may take less time depending upon the situation of the SME (i.e., if the business faces natural hazard risk) and the extent to which the respondent decides to elaborate upon their responses. SME owners/managers will complete the survey. If desired by the respondent, telephone interaction will be available, as necessary.

The response rate expected is 20-30 %. It should be noted that responding to more than 50 % of the survey questions is considered as a complete survey response. All questions are optional; thus, we expect that some businesses will answer only a portion of the questions.

Assuming a 100% response rate, the total maximum burden hours would be 300 hours (1,200 SMEs X 15 minutes survey time/SME / 60 min. per hour). This data will not be stored in a Privacy Act System of Records where information is pulled by a personal identifier; therefore, a SORN is not required. Once 1,200 complete responses have been made to the survey, the link will be snoozed to ensure no overburden to the public.

The data collection should take place as soon as possible to capture the next stage responses as the pandemic develops and allow for us to still obtain information about the first stages of pandemic (re)actions. The collection should gather data on the SMEs' experiences with the natural disasters that occurred since the start of the pandemic and the SMEs' perceptions about recovery from COVID-19 related limits and additional concerns (e.g., limits on revenue from upcoming holiday season sales). Furthermore, capturing data as immediately as possible helps ensure that SMEs that may find themselves out of business in future waves are captured (a current weakness of much SME natural hazard recovery research).

The survey will be administered as an electronic survey and in most cases the owner (or manager) of the business will fill-in the survey on computer, smartphone, or other digital device. The tool is expected to take a maximum of 15 minutes to complete.

Given that the survey will be conducted online, resources (staff, time, and funds) that are typically limiting factors to similar on-the-ground in-person surveys are less limited in this case.

Furthermore, an informational report on the Wave 1 data collection and links about this project and the NIST community resilience work, generally, can be included in the collection information provided. A Spanish version of the survey will be made available, as well.

Information will not be retrieved by any personal identifier (such as name); therefore, this is not a Privacy Act System and is not subject to a Privacy Act Statement or SORN.

4. Describe how the results of the survey will be analyzed and used to generalize the results to the entire customer population.

It is expected that the findings of this survey will inform the understanding of the Federal agencies and other entities (e.g., local economic development offices) that work directly with SMEs as to longitudinal trajectories of the following: (1) the novel resilience-based mitigation actions employed during the COVID-19 pandemic by small- and medium-sized enterprises (SMEs) by sector, (2) challenges in implementing resilience-based mitigation actions, (3) utilization of past strategies and approaches to provide assistance to the current situation, and (4) planned resilience actions and strategies.

In a survey on COVID-19 impacts to supply chains, nearly 75 percent of companies report supply chain disruptions in some capacity due to coronavirus-related transportation restrictions, and more than 80 percent believe that their organization will experience some impact because of COVID-19 (Boyd, 2020). Although empirical evidence says that businesses that have been exposed to previous disasters are more likely to be prepared for future disasters and that a disaster experience may lead business owners to reconsider the importance of developing business recovery or mitigation plans (Dahlhamer and Tierney, 1998), there is no research on how individual businesses may use this experience when exposed to compound acute risks (i.e., multiple risks).

Qualitative survey responses will be appropriately coded and mapped within the quantitative dataset. The researchers will also augment this effort with 'big data' sources (e.g., Google trends identifying which news stories were most searched on a given date) as controls as SME-level data is analyzed. Both qualitative and quantitative analysis will be performed on the data, as a standalone data set, but also as a longitudinal dataset combined with responses from Wave 1.

Immediate data findings will be produced and communicated to Federal partners to help influence their guidance to SMEs in the face of multiple risks. Once data has been collected and analyzed, NIST researchers will work with counterparts in appropriate Federal agencies, such as FEMA, SBA, and EDA, to appropriately frame and provide guidance to businesses.

Additional data analysis objectives are to: (1) Gain a better understanding of the nature of impacts experienced by small and medium sized businesses; (2) Understand the experience of business owners and managers through different kinds of extremes as well as how their perceptions of risk may change between event types; (3) Provide an analysis of the risk profiles of small business owners in vulnerable areas and the resources they currently have access to that support response, recovery and continuity.

There are four main survey sections in the tool: (1) business interruption and adaptation related to COVID-19, (2) natural hazard experience, (3) attitudes section focused on the business' future plans, and (4) business information. Analyzing these types of data singularly and in conjunction is expected to extend understanding of business interruption in general and across sectors.

It is expected that administering the survey tool will provide useful information to researchers on best practices for conducting longitudinal research on natural hazard readiness, especially while recovering from the impacts of COVID-19 and using an electronic survey process.

Finally, the data collected will serve to understand the recovery trajectories of SMEs that experience a complex event (e.g., natural disaster) during the pandemic period. In the data and literature, there is very minimal information about trajectories during different phases of disaster (e.g., pandemic event), opposed to data specific to impacts only post-event.

References:

Bivens, J. (2020, March 17). Coronavirus shock will likely claim 3 million jobs by summer: Policy is needed now to curb further losses. *Economic Policy Institute*. https://www.epi.org/blog/coronavirus-shock-will-likely-claim-3-million-jobs-by-summer/

Boyd, J. (2020). *COVID-19 Survey: Impacts on global supply chains*. Institute for Supply Management.

Dahlhamer, J. M., & Tierney, K. J. (1998). Rebounding from disruptive events: Business recovery following the Northridge earthquake. *Sociological Spectrum, 18*(2), 121–141. https://doi.org/10.1080/02732173.1998.9982189

NOAA (National Oceanic and Atmospheric Association) (2020). National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters. https://www.ncdc.noaa.gov/billions/

Thomas, L. (2020, March 16). Retail store closures in the US could explode because of the coronavirus. *CNBC*. https://www.cnbc.com/2020/03/16/retail-store-closures-in-the-us-could-explode-because-of-coronavirus.html