NACCHO
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2018 Model Practices

Applicant Information

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Size

Select a size:

- ☐ Small (0-50,000)
- ☐ Medium (50,000-499,999)
- ☑ Large (500,000+)

Practice Categories

Model and Promising Practices are stored in an online searchable database. Applications may align with more than one practice category. Please select all the practice areas that apply.: *

- ☐ Access to Care
- ☐ Advocacy and Policy Making
- ☐ Animal Control
- ☐ Coalitions and Partnerships
- ☐ Communications/Public Relations
- ☐ Community Involvement
- ☐ Cultural Compentence
- ☑ Emergency Preparedness
- ☐ Environmental Health
- ☐ Food Safety
- ☐ Global Climate Change
- ☐ Health Equity
- ☐ HIV/STI
- ☐ Immunization
- ☑ Infectious Disease
- ☐ Informatics
- ☐ Information Technology
- ☐ Injury and Violence Prevention
- ☐ Marketing and Promotion
- ☐ Maternal-Child and Adolescent Health
- ☐ Organizational Practices
- ☐ Other Infrastructure and Systems
- ☐ Primary Care
- ☐ Quality Improvement
- ☐ Research and Evaluation
- ☐ Tobacco
- ☐ Vector Control
- ☐ Water Quality
- ☐ Workforce
- ☐ Conference Theme: Unleashing the Power of Local Public Health

Other::

Is this practice evidence based, if so please explain.:

The proposed practice is evidence-based. Several surveillance methods from past hurricane responses, such as after Hurricane Katrina and Sandy were reviewed as references, in addition to CDC shelter surveillance tools and guidelines (https://emergency.cdc.gov/shelterassessment/index.asp). Throughout our shelter surveillance, data had been collected, analyzed, and disseminated to monitor disease trends in the shelter, provide situational awareness, and to assist evidence-based decision making.

Winnable Battles

To keep pace with emerging public health challenges and to address the leading causes of death and disability, CDC initiated an effort called Winnable Battles to achieve measurable impact quickly. Winnable Battles are public health priorities with large-scale impact on health and known effective strategies to address them. Does this practice address any CDC's seven Winnable Battles? If so, please choose from the following:: *

- ☐ Food Safety
- ☐ HIV in the U.S.
- ☐ Nutrition, Physical Activity, and Obesity
- ☐ Tobacco
- ☐ Healthcare-associated Infections
- ☐ Motor Vehicle Injuries
- ☐ Teen Pregnancy
- ☑ None

Overview: Provide a brief summary of the practice in this section (750 Word Maximum)

Your summary must address all the questions below:

- Brief description of LHD- location, demographics of population served in your community
- Describe public health issue
- Goals and objectives of the proposed practice
- How was the practice implemented/activities
- Results/Outcomes (list process milestones and intended/actual outcomes and impacts.
  - Were all of the objectives met?
  - What specific factors led to the success of this practice?
- Public Health impact of practice
- Website for your program, or LHD.

750 Word Maximum

Please use this portion to respond to the questions in the overview section.: *

Harris County Public Health (HCPH) is the health department for Harris County, Texas, the third most populous county in the United States. The HCPH jurisdiction includes a socio demographically diverse population of approximately 2.2 million within the unincorporated areas and over 30 other municipalities located in Harris County, Texas (excluding the City of Houston). Public Health Issue Due to its geographical location and proximity to the gulf coast, the County is prone to natural disasters, particularly hurricanes. On August 25th, 2017, Hurricane Harvey made landfall along the Texas coast as a Category 4 storm. It is estimated that the ensuing rainfall caused record flooding in 70% of Harris County. Over 30,000 residents were displaced and 36 deaths occurred due to the devastation. On August 29th, the County and community partners set up a 10,000 bed mega-shelter at NRG Center, in efforts to centralize refuge efforts. HCPH was responsible for round-the-clock surveillance to monitor resident health status and prevent communicable disease outbreaks within the mega-shelter. Although generic tools and methods were available for public health surveillance in refuge shelters after a hurricane, they tended to be for small and less complex events, certain areas of response, and assumed staffing resources were robust. There was no holistic model of public health surveillance and response with ready-to-use tools tailored for a mega-shelter. The challenge faced was to develop a comprehensive surveillance and disease prevention model to monitor and protect the population's health in the mega-shelter. Goal To develop a holistic model with ready-to-use tools for a large evacuation shelter in order to monitor health status and prevent communicable disease outbreaks in the shelter. Objectives • Identify infectious diseases and outbreaks in the shelter in a timely manner and implement effective control measures to prevent further spread of illness • Identify severe exacerbation of chronic conditions, including new or existing mental issues and provide interventions • Timely dissemination of health alerts and services available to shelter residents and information sharing between HCPH and partners • Apply One Health principles to achieve a holistic approach to public health surveillance incorporating various types of disease surveillance along with environmental surveillance and animal health considerations Practice Implementation and Activities The goal and objectives of the proposed practice were accomplished through direct and indirect resident health assessments, along with coordinated prevention and disease control efforts, and collaboration with multiple partners in the shelter. Active surveillance was conducted in the NRG shelter to detect communicable and high-consequence illnesses and to prevent disease transmission. An online survey tool and a novel epidemiology consultation method were developed to aid in rapid assessment of surveyed residents displaying potentially worrisome symptoms, in which, an epidemiologist performed an on-the-spot consultation and determined whether further action such as clinic referral, isolation, or education was needed. This approach combined with the cot-to-cot survey ensured timely identification of disease and immediate implementation of interventions, and provided efficiency when only limited epidemiologists were available for shelter surveillance. This compounded approach has not been used in the past to the best of our knowledge. Results/Outcomes The shelter housed 3,365 evacuees at its peak. 3,606 household health surveys were completed during 20 days of active surveillance. Of these resident surveys, 395 epidemiology consultations were completed. Our multifaceted surveillance uncovered an Influenza A outbreak, a Norovirus cluster, and several cases of strep throat. The addition of chronic disease and mental health questions on the surveillance tool assisted our team in addressing concerns and gaps noted in prior disaster response efforts that focused only on communicable disease surveillance. Furthermore, through these activities, a holistic approach with ready-to-use instruments was developed, implemented, and evaluated, and now serves as a template for future surveillance and response of public health emergencies. Public Health Impacts HCPH's rigorous surveillance and response model in the NRG Center mega-shelter resulted in timely identification and isolation of patients with influenza like illness (ILI) and gastrointestinal (GI) illness, thus, prevented large outbreaks during a lengthy 20-day operation. Additional success factors included close partnerships with onsite clinical and pharmacy teams, cooperative and engaged shelter leadership, integration of One Health concept including human, animal, and environmental health to improve disease detection and control efforts, synergistic internal surveillance team dynamics, availability of student volunteers, sufficient quantities of influenza vaccine, and access to mobile survey technology. HCPH's innovative disaster response system at the NRG mega-shelter and developed surveillance methods combined with assessment tools may serve as a model practice for future public health emergencies in Harris County and other jurisdictions. Website: http://publichealth.harriscountytx.gov/.

Responsiveness and Innovation

A Model Practice must be responsive to a particular local public health problem or concern. An innovative practice must be (1) **new to the field of public health (and not just new to your health department)** OR **(2) a creative use of an existing tool or practice**, including but not limited to use of an Advanced Practice Centers (APC) development tool, The Guide to Community Preventive Services, Healthy People 2020 (HP 2020), Mobilizing for Action through Planning and Partnerships (MAPP), Protocol for Assessing Community Excellence in Environmental Health (PACE EH). Examples of an inventive use of an existing tool or practice are: tailoring to meet the needs of a specific population, adapting from a different discipline, or improving the content.

- Statement of the problem/public health issue
- What target population is affected by problem (please include relevant demographics)
    - What is the target population size?
    - What percentage did you reach?
- What has been done in the past to address the problem?
- Why is the current/proposed practice better?
- Is current practice innovative? How so/explain?
    - Is it new to the field of public health
      OR
    - Is it a creative use of existing tool or practice:
      What tool or practice did you use in an original way to create your practice? (e.g., APC development tool, The Guide to

Community Preventive Services, HP 2020, MAPP, PACE EH, a tool from NACCHO's Toolbox etc.)

- Is the current practice evidence-based? If yes, provide references (Examples of evidence-based guidelines include the Guide to Community Preventive Services, MMWR Recommendations and Reports, National Guideline Clearinghouses, and the USPSTF Recommendations.)

2000 Word Maximum

Please state the Responsiveness and Innovation of your practice: *

Public health issue Hurricane Harvey caused large crowding of evacuees into shelters, which presented an important challenge to address: how to avoid additional public health disasters that come with communal living. One of the primary concerns were communicable diseases. Although generic tools and methods were available from past disasters such as Hurricanes Katrina and Sandy (2-4), they had been utilized separately. There was no holistic model of public health surveillance and response with ready-to-use tools tailored specifically to a mega-shelter after a catastrophic event. To respond effectively to such a disaster would require a comprehensive model with specific technologies capable of sustaining such a response. Here, we will describe a holistic disaster response model created during HCPH's response to Hurricane Harvey, along with the tools that were created that help to fulfill the missions of public health surveillance and response in a large evacuation shelter after a disaster. During Hurricanes Katrina and Ike, a rapid needs assessment and public health surveillance had been conducted over a 12 day response duration, utilizing traditional shelter assessment questionnaires. During Hurricane Katrina, a health assessment in evacuees sheltered at one of the mega-shelters was conducted upon initial check in at the shelter. A nightly cot-to-cot disease surveillance survey amongst existing shelter residents was only initiated after a Norovirus outbreak was identified. This cot-to-cot survey instrument focused on identification of GI symptoms that would assist in the identification of additional individuals with Norovirus. The survey was primarily conducted and organized by a school of public health volunteer team without multiple partnerships. The proposed practice used a holistic approach that integrated multiple innovations, consisting of: • Epidemiology consultations were combined with cot-to-cot active surveillance which allowed for in-time and targeted response to survey findings. A daily survey was conducted and actions were immediately taken during the survey – epidemiological consultations for symptomatic residents and immediate referral to onsite clinics and isolation rooms if deemed necessary. Symptoms of infectious disease, exacerbation of chronic disease, and mental health issues among evacuees were closely monitored. Cot-to-cot survey team consisted of an Epi team lead that conducted the rapid epidemiology consultations for shelter residents displaying symptoms consistent with communicable illness or other signs of distress during nightly cot surveys. • Epidemiology consultations also yielded additional data and facilitated testing, referrals, education, and implementation of control measures when needed. Onsite rapid assay tests and public health laboratory testing were used to confirm disease diagnoses. When indicated, disease control measures were implemented and residents referred for further evaluation. • A One Health approach to understanding risk not only at the human level, but also animal and environmental interface was fostered. • Knowledge and technology transfer between public health disciplines internal to and external to HCPH who were working in reducing disease risk, were streamlined through Epidemiology. This comprehensive surveillance method also utilized additional active surveillance using chart abstraction from clinics, pharmacies, direct communications with clinical teams, and monitoring/management of isolation rooms. Chart abstraction from on-site clinics consisted of reviewing all patient visits and collecting data on number of visits for certain issues such as communicable disease symptoms, mental health issues, and prescription refills. From pharmacies, we collected information on the types of prescriptions filled, how many, and number and type of vaccines given to shelter residents (pharmacies offered on-site flu, tetanus, and Hepatitis A vaccines). These clinic and chart abstractions allowed HCPH to follow and identify any communicable disease trends and allowed another avenue for providing early identification of disease and early intervention with control measures. • The online cot-to-cot survey tool provided flexibility for easy modification day to day. Each day it was modified to respond to resident needs and findings, which is unique beyond general communicable disease symptom questionnaires. For example, we added additional questions including recommendation of vaccination after the identification of flu outbreak. As mentioned, the surveillance and response after Hurricane Harvey in the NRG mega-shelter covered not only shelter residents, but also onsite clinics and pharmacies. The multiple layer approach of household survey and epidemiologist consultations, integrated with a One Health concept of integrating environmental surveillance, and the communications team on-site, made the practice comprehensive and innovative. Previous to this disaster, the traditional practice was more aligned with working in silos rather than a coordinated system. During Hurricane Harvey, this model practice was crafted where timely results across public health disciplines continuously informed decision making, thereby demanding model refinement. The proposed practice is evidence-based. Several surveillance methods from past hurricane responses (2-4) such as after Hurricane Katrina and Sandy were reviewed as references, in addition to CDC shelter surveillance tools and guidelines (https://emergency.cdc.gov/shelterassessment/index.asp). Throughout our shelter surveillance, data had been collected, analyzed, and disseminated to monitor disease trends in the shelter, provide situational awareness, and to assist evidence-based decision making.

LHD and Community Collaboration

The LHD should have a role in the practice's development and/or implementation. Additionally, the practice should demonstrate broad-based involvement and participation of community partners (e.g., government, local residents, business, healthcare, and academia). If the practice is internal to the LHD, it should demonstrate cooperation and participation within the agency (i.e., other LHD staff) and other outside entities, if relevant. An effective implementation strategy includes outlined, actionable steps that are taken to complete the goals and objectives and put the practice into action within the community.

- Goal(s) and objectives of practice
- What did you do to achieve the goals and objectives?
    - Steps taken to implement the program

- Any criteria for who was selected to receive the practice (if applicable)?
- What was the timeframe for the practice
- Were other stakeholders involved? What was their role in the planning and implementation process?
    - What does the LHD do to foster collaboration with community stakeholders? Describe the relationship(s) and how it furthers the practice goal(s)
- Any start up or in-kind costs and funding services associated with this practice? Please provide actual data, if possible. Otherwise, provide an estimate of start-up costs/ budget breakdown.

5000 words maximum

Enter the LHD and Community Collaboration related to your practice (5000 words maximum): *

Goal To develop a holistic model with ready-to-use tools for a large evacuation shelter in order to monitor health status and prevent communicable disease outbreaks in the shelter. Objectives • Identify infectious diseases and outbreaks in the shelter in a timely manner and implement effective control measures to prevent further spread of illness • Identify severe exacerbation of chronic conditions, including new or existing mental issues and provide interventions • Timely dissemination of health alerts and services available to shelter residents and information sharing between HCPH and partners • Apply One Health principles to achieve a holistic approach to public health surveillance incorporating various types of disease surveillance along with environmental surveillance and animal health considerations Disease control activities in this shelter surveillance included creation of respiratory and GI isolation rooms, provision of over 771 influenza vaccinations, generous distribution of hand sanitizer throughout the shelter, placement of hygiene signage, and frequent bilingual public health public service announcements in the dormitory areas helped strengthen the community-based approach to reducing risks. In shelter surveillance, active, passive, and syndromic surveillance approaches should be used. The best approach will depend largely on the size and makeup of the shelter population and the information requirements of emergency managers and public health officials. In sheltering operations, health surveillance may need to adapt to the needs of responding authorities, situational dynamics, the changing makeup of the shelter population, and variations in population numbers. Active surveillance, where staff interview sheltered individuals to document new health issues on a regular basis, is considered the most desirable and successful approach. LHDs with limited resources to conduct active surveillance may choose to implement a more passive approach, which may result in diminished accuracy and completeness of the reported illness data and delay identification of emerging needs or outbreaks. Hence, a blend of surveillance approaches may be adapted to shelter needs. Regardless of the approach chosen, data analysis must be timely and reports readily available to decision makers to facilitate response actions. Cot-to-cot surveys Surveys were conducted every evening at 6 pm for 20 nights. Survey teams were formed of staff from the HCPH epidemiology program and other departments, volunteers from UTSPH, Women's university of Texas and other volunteers. The number of surveyors changed depending on availability of internal resources and numbers of volunteers registered. Just in time trainings were offered prior to surveys each night and discussion & debrief sessions were conducted after survey every night. Up to date news and messages were given to surveyors to be delivered to residents such as health alerts and available services at the shelter. The online cot-to-cot survey tool was flexible and evaluated and modified each day to respond to dynamic resident needs and findings. For example, the survey was modified after an influenza case was detected and each resident was asked if he/she had received the flu vaccine, and if not, why. During this time, this line of questioning allowed us to engage in discussion and provision of education that increased the likelihood that a resident would subsequently seek vaccination. The NRG shelter had three living areas: single men unit, family unit, and single women unit. We divided our survey team into five groups (1 group for each dormitory area, 1 for dining area, and 1 for common areas) and each group had an epidemiologist as the team leader. No statistical sampling method was practiced during the survey. Each survey group tried to reach all households in designated areas to conduct surveys. The survey questions were answered by the head of household for the entire family. Epidemiology consultations Epidemiologists served as the Epi team leaders to guide surveyors during the survey and conduct epidemiological consultations. If symptoms or conditions were identified in family member(s) during the cot-to-cot survey, the individual(s) would be referred to survey team leader for an epidemiology consultation. If an individual was identified as having fever, diarrhea, and severe exacerbation of chronic conditions including mental concerns, the patient would be referred to onsite clinic and isolation was implemented. Education was offered as a control measure for all consultations, regardless of need for referral. A number of shelter residents were referred to the clinic after reporting exacerbation of chronic conditions or mental health concerns, including one individual with suicidal ideations. Additional questions inquired about needs for medical equipment, medications, and original home situations and environments. Clinical referrals were taken place after epi consultations based on epi consultations. Multi-targeted active or passive surveillance took place daily at the shelter: Cot-to-Cot survey, medical records review and chart abstractions at onsite clinics, monitoring of daily prescriptions with onsite pharmacies, and monitoring and managing of isolation rooms. One Health integration Human health was one aspect of overall surveillance. A One Health approach to understanding risk not only at the human level, but also animal and environmental interface was fostered. Surveillance included asking questions about the residents' environment which could impact their health status, including bug or mosquito bites, animal bites. The veterinary area was routinely assessed to ensure pets were vaccinated prior to entry in sleeping areas, and HCPH proposed a more healthy set up in the sleeping area as it related to pets and their proximity to other residents. After detecting the flu outbreak, vigorous coordinated hygiene efforts with the environmental team was made. Our team oversaw the environmental surveillance and the communications team at the shelter. This allowed for seamless coordination of public health signage, public safety announcements, and education during surveys. Technological tools Qualtrics, an online survey software platform was used to create a tailored survey based on the CDC shelter assessment questionnaire with modifications to accommodate additional questions regarding health status, chronic conditions, and urgent medical needs. If a cot-to-cot survey required additional follow-up by an Epi team lead, surveyors used mobile phones to facilitate effective ongoing communication with team lead. Epi team leads would be in open communication with supervisors using mobile phones. The consultation itself was completed using an online survey tool, also using Qualtrics as a survey platform. This data collection method facilitated our ability to collate collected consultation data and observe for trends in symptoms addressed or interventions offered. Partnerships external to HCPH Partnership with three onsite clinics: Harris County Medical Society (HCMS) Urgent Care Clinic including Pediatric Urgent Care,

Baylor/Harris Health Same Day Clinic and Baylor/Harris Health mental Health Clinic o On a daily basis, the HCPH team visited the on-site clinics to introduce ourselves to the oncoming medical team shifts. Cellular phone number of day and night shift surveillance supervisors in charge were provided to all clinics and included in the large print outs posted at doors and poles next to clinics in order for clinic to report disease and discuss patient related issues. Multiple calls were received from clinics to report fever and diarrheal illness and recommendations for isolation and specimen collection were immediately provided to clinics. o Two isolation rooms were monitored and managed: one for flu & flu like illnesses and the other for diarrheal illness. Epidemiologists visited clinics at each shift to introduce themselves to doctors and nurses and to share health alerts. They would also check patients every shift to monitor their symptoms and provided their dates of release. o Specimens were collected from symptomatic patients and submitted to public health laboratory for PCR testing of Influenza and Norovirus. Clinics at shelter only ran rapid flu testing, but in order to improve the specificity of testing, our public health nurse also collected specimens for 14 individuals for PCR testing, which resulted in identifying a Flu A/H3 outbreak with 20 individuals. o Medical records review started at 7 pm every night to abstract information on symptoms of infectious diseases, injuries, exacerbation of chronic conditions and mental illness. Partnership with onsite pharmacies: Walgreens and CVS. Epidemiology staff visited both pharmacies every night to collect information of vaccines administered and Tamiflu provided at their sites. Other partners: The agency that operated the shelter (BakerRipley), medical officers who were in charge of clinics and pharmacies and our internal HCPH Incident Command Structure.

Evaluation

Evaluation assesses the value of the practice and the potential worth it has to other LHDs and the populations they serve. It is also an effective means to assess the credibility of the practice. Evaluation helps public health practice maintain standards and improve practice. Two types of evaluation are **process** and **outcome**. Process evaluation assesses the effectiveness of the steps taken to achieve the desired practice outcomes. Outcome evaluation summarizes the results of the practice efforts. Results may be long-term, such as an improvement in health status, or short-term, such as an improvement in knowledge/awareness, a policy change, an increase in numbers reached, etc. Results may be quantitative (empirical data such as percentages or numerical counts) and/or qualitative (e.g., focus group results, in-depth interviews, or anecdotal evidence).

- What did you find out? To what extent were your objectives achieved? Please re-state your objectives.
- Did you evaluate your practice?
    - List any primary data sources, who collected the data, and how (if applicable)
    - List any secondary data sources used (if applicable)
    - List performance measures used. Include process and outcome measures as appropriate.
    - Describe how results were analyzed
    - Were any modifications made to the practice as a result of the data findings?

2000 Words Maximum

Please enter the evaluation results of your practice (2000 Words Maximum): *

Objective 1- Identify infectious diseases and outbreaks in the shelter in a timely manner and implement effective control measures to prevent further spread of illness • Cot to cot surveys were conducted every evening by interviewers consisting of HCPH epidemiologists and staff, and volunteers of UTSPH and TWU Nursing School in order to continuously and closely assess evacuees' health and needs. Surveys were conducted around 6pm every evening and took about three hours to complete. The survey was created using Qualtrics, an online survey software and links to both the cot-to-cot surveys and epidemiology consults were sent to surveyors. After surveys were completed, data from Qualtrics was exported into Excel to calculate variables quantitatively. Survey answers and comments were analyzed by reading and documenting any concerns or other key themes in the following morning's report. • Once symptoms of a communicable disease were been identified through the cot-to-cot survey, an epidemiology consultation was conducted. This consultation asked specific questions regarding illness and willingness to visit clinic for evaluation. The family of the ill were also interviewed to determine others ill in household. All ill individuals exhibiting communicable symptoms were placed in isolation rooms away from other evacuees and public shelter staff. The type of room was dependent on the type(s) of symptoms an ill individual has. Two isolation rooms were being used in the clinic: one for respiratory symptoms and one for gastrointestinal symptoms. • Surveillance activities at the NRG Shelter incorporated a one health approach. The cot-to-cot surveys and epidemiology consultation surveys were used to monitor and confirm the course of outbreaks, guide resource allocation, ask additional questions on the environment, ensure pets in veterinary areas were vaccinated prior to entry to area, mental health concerns, needs for medical equipment and medications, support for chronic care, evacuees' original home situation. Objective 2- Identify severe exacerbation of chronic conditions including new or existing mental issues and provide interventions • Epi consultations were utilized within the NRG Center which yielded real-time information on the type of acute/chronic symptoms evacuees were reporting, and helped to facilitate appropriate testing, provide education, and when necessary referred for further evaluation outside of NRG Center mega-shelter. Baylor/Harris Health Mental Health Clinic shared with us the total encounters for the day. Objective 3- Timely dissemination of health alerts and services available to shelter residents and information sharing between HCPH and partners • Implementation of control measures, included hand-washing campaigns using public announcements in English and Spanish throughout the day which emphasized the importance of hand washing, using alcohol-based hand sanitizer, ensuring those with identified symptoms were evaluated by the clinic and isolated if needed, , and receiving the flu shot. Education was additionally provided during nightly cot-to-cot surveys with residents. Daily surveys and aforementioned control measures proved critical in strengthen the community-based approach to reducing risks. Objective 4 - Apply One Health Principles to achieve a holistic approach to disease surveillance that incorporated various types of disease surveillance along with environmental surveillance and animal health considerations • Due to the proximity of pets in dormitory areas, our team, which included environmental sanitarians and veterinarians, increased hygiene-related environmental surveillance in the dormitory and

common areas of the shelter, ensured pets had appropriate vaccination prior to entry in sleeping areas. Also, we increased hand sanitizer availability, ensured proper trash can placement, reassessed shelter setup with inclusion of pets, ensured frequent cleaning of common areas and bathroom facilities, including eating areas, and provided education to residents while doing so. Effective public health surveillance and implementation of disease control measures in disaster shelters are critical to detecting and preventing communicable illness. HCPH's rigorous surveillance and response model in the NRG Center mega-shelter, including the online survey tool and novel epidemiology consultation method resulted in timely identification and isolation of patients with GI illness and ILI. These were likely the key factors in the success of the model. The Harris County's NRG Center mega-shelter housed 3,365 evacuees at its peak. 3,606 household health surveys were completed during 20 days of active surveillance, representing 7,152 individual resident evaluations, and 395 epidemiology consultations. Performance measures consisted of all shelter-level data that were aggregated into a single report. Every morning, an executive summary was prepared by the epidemiology staff leadership that included prior 24 hour aggregate data and prior days' data compared with any trends highlighted. Information collected by HCPH epidemiologists were included in the daily report: Total number of shelter evacuees, Communicable disease case counts, Isolation room occupancy for GI and Respiratory, Total number of household surveys, Total number of Epi consults, concerns/needs of evacuees, Total number of flu shots administered. The report also included environmental assessments of total number of sanitizing dispensers filled. Assessments also included daily review of onsite medical clinics, mental health clinic, pharmacies, and vaccination activities within the NRG Center Shelter. Results from the surveys allowed for easy modification of the survey instrument day to day to respond to evacuees' needs. This timely information captured many facets of public health and partnerships which facilitated trend detection and assisted in identifying issues that were relayed daily to leadership and decision-makers through the ICS chain of command. Results The multi-faceted activities within NRG shelter produced data daily to evaluate the health status of evacuees and the environmental status of the shelter. Outcome evaluation measures this holistic approach and helps to determine if the practice is aligned with producing necessary results intended to achieve. The methodology utilized in the shelter response included two types of data collection: secondary data review that were received from clinics and pharmacies and primary data collection at the household-level. Using these data, quantitative findings included active surveillance of 3,606 household health surveys, representing 7,152 individual resident evaluations, and 395 epidemiology consultations that was conducted at the NRG Center mega-shelter for 20 days. Cot to cot surveys began with obtaining consent to answer survey questions from the evacuees, followed by confirming the evacuee is the head of the household in order to continue with the rest of the survey. This was important question to ensure same households are not surveyed more than once each evening. Other data collected included total number in household, clinic visits within the past 24 hour, zip code of residence prior to evacuation, number of nights stayed at the NRG shelter, symptoms, the dormitory unit and quadrant of where the evacuee was residing. Epidemiology consultation surveys included demographics of evacuee, the dormitory unit and quadrant of where the ill evacuees were residing, onset of illness, symptoms, others ill in family or nearby, and what type of action was taken. The actions taken included: referral to clinic/hospital/public health, isolation, already being seen at clinic, prescription/prophylaxis, education/control measures, specimens collected, and specimen container being provided to guest. This collective methodological framework allowed for timely detection of an influenza cluster of 20 cases, a norovirus cluster of 5 cases, and 3 isolated strep throat cases. Additionally, a number of shelter residents were referred to the clinic after reporting exacerbation of chronical conditions or mental health concerns, including one individual with suicidal ideations. Disease control activities included creation of isolation rooms by symptoms, one for respiratory symptoms and one for gastrointestinal symptoms, provision of over 771 influenza vaccinations to shelter residents, staff/volunteers/first responders, generous distribution of hand sanitizer throughout the shelter including staff and volunteers, placement of hygiene signage, and frequent bilingual public health public service announcements in the dormitory areas. Survey tools resulted in collecting specimens from patients and submitting to public health laboratory to testing of Influenza PCR and Norovirus. Testing for PCR was an important additional step in identifying and linking Influenza illnesses of the same strain. Summary of Influenza Tests Type of test Number of positives Rapid Test A&B + 1 Rapid Test A+ 5 Flu A/H3 + by PCR 14 Total # of Flu cluster 20 In addition to testing for Influenza, stool samples were also collected from five patients including a baby, who were experiencing GI symptoms. Summary of Stool Tests Type of test Number of positives Norovirus Genogroup II RNA (+) by PCR 4 Probable case by epi-link 1 Total # Norovirus cluster 5 Individuals identified with flu-like-illness or GI symptoms were placed in isolation in efforts to control the spread of disease. This proved to be crucial in limiting an identified flu outbreak and preventing a large-scale norovirus outbreak.

Sustainability

Sustainability is determined by the availability of adequate resources. In addition, the practice should be designed so that the stakeholders are invested in its maintenance and to ensure it is sustained after initial development (*NACCHO acknowledges that fiscal challenges may limit the feasibility of a practice's continuation*.)

- Lessons learned in relation to practice
- Lessons learned in relation to partner collaboration (if applicable)
- Did you do a cost/benefit analysis? If so, describe.
- Is there sufficient stakeholder commitment to sustain the practice?
    - Describe sustainability plans

1500 Words Maximum

Please enter the sustainability of your practice (2000 Words Maximum): *

The lessons learned: Sustainability should not be an afterthought, but rather incorporated into emergency response plan. Continuous information acquired from multiple on-site clinics and pharmacy partnerships and community organizations, along with use of electronic surveys and technological solutions can enhance emergency response, optimize situational awareness, and strengthen real-time communication to share the whole picture of the situation. Our use of the mobile cot-to-cot survey instrument was unique in that it allowed flexibility to respond to the changing conditions within the mega-shelter, and the changing needs of the residents. It also reflected the diverse needs of evacuees, focusing on both communicable disease symptoms as well as on mental health needs and chronic health needs such as need for prescription refills, durable medical equipment, and the like. The epidemiology consultation instrument used during HCPH's Hurricane Harvey response was novel to the disease surveillance process and was found to be a reliable measure of collecting real-time data during a public health emergency. Consultation survey questions focused on asking more detailed questions about potentially worrisome symptoms revealed during the cot-to-cot survey. During consultation, we were able to discern whether someone with diarrhea also had additional symptoms worrisome for communicable disease, whether clinical consultation had already taken place, and what type of referral may still be needed, including specimen collection if necessary. The consultation survey was developed and refined over the span of the response and these questions could be applicable to other large shelter settings for disease surveillance purposes. The strong collaboration and access to other on-site clinics and pharmacies data allowed for HCPH epidemiologists to detect active clusters of infectious disease and provide control measures quickly. This efficient flow of information helped move toward a system-based channel of information where when data became available, was streamlined between departments into the Epidemiology program where valuable data was assessed and analyzed and ultimately shared daily with all partners. Finally, the comprehensive One Health approach that HCPH took during its response, combining both traditional disease surveillance with epidemiologic surveillance, and communicating with on-site veterinary partners is one that is sustainable and should be utilized in future disaster response activities. The coordinated approach, including wide dissemination of surveillance findings each morning amongst stakeholders, ensured that all organizations and partners including government, private and community organizations, involved received timely information in order to reduce duplication and inefficiencies. In terms of HCPH's use of an mobile survey platforms such as Qualtrics, we noted several advantages over traditional paper questionnaires, including minimized error, reduced need for paper and ink, reduced need for data entry and data analysis staff, centralized location of responses, and ease of sending and updating information in real time. All of these factors were key in our successful mission at the NRG mega-shelter in preventing the spread of disease and identifying both communicable, chronic disease, and mental health issues requiring additional attention. Connectivity and the necessity of a good power supply, mobile, web-based access are crucial during a disaster, however. There is a great benefit to stakeholders to sustain use of these mobile survey platforms for future public health emergencies. In sum, our disease surveillance methodologies during Hurricane Harvey response efforts were successful in rapidly identifying needs, and then streamlining knowledge sharing, situational awareness and collaboration, and are generalizable to other public health emergencies in large shelter settings. Opportunities for Future Response Efforts Following HCPH's disaster response, hot wash debriefing sessions were offered to individuals involved to address the after-action topic critical for effective disaster response and recovery and to evaluate future opportunities to initiate sustainable response and recovery. The informal debriefings took place every evening at the end of survey activities which included staff and volunteers. A recommendation in sustaining unexpectedly prolonged response duration is to provide staff and first responders with Psychological First Aid (PFA) following a Disaster. Many of the staff and first responders experienced significant personal hurricane-related losses, making PFA training even more essential part of training. PFA is an evidence-based approach utilized in disaster response to assist anyone impacted by a traumatic event (1) – whether in shelters, hospitals, schools, or community settings. Disaster planning should also consider implementing protective measures for standard and airborne isolation within a shelter to prevent the further spread of disease. It became apparent that control of future outbreaks with different etiologies could be difficult to contain because the shelter had limited staff and limited number of unoccupied rooms to isolate any individuals who became ill. 1 Uhernik, J. A., & Husson, M. A. (2009). Psychological First Aid: An Evidence Informed Approach for Acute Disaster Behavioral Health Response. In G. R. Walz, J. C. Bleuer, & R. K. Yep (Eds.), Compelling counseling interventions: VISTAS 2009 (pp. 271-280). Alexandria, VA: American Counseling Association 2 Challenges to Implementing Communicable Disease Surveillance in New York City Evacuation Shelters After Hurricane Sandy, November 2012. Alison D. Ridpath, Brooke Bregman, Lucretia Jones, Vasudha Reddy, HaeNa Waechter, Sharon Balter. Public Health Reports / January–February 2015 / Volume 130 3 Surveillance in Hurricane Evacuation Centers --- Louisiana, September--October 2005. Morbidity and Mortality Weekly Report. January 20, 2006 / 55(02);32-35. Centers for Disease Control and Prevention. 4 Estimating the frequency and characteristics of respiratory disease outbreaks at mass gatherings in the United States: Findings from a state and local health department assessment. Figueroa, A., Gulati, R.K., Rainey, J.J. PLoS ONE, 12(10), art. no. e0186730.

Additional Information

How did you hear about the Model Practices Program:: *

- [x] I am a previous Model Practices applicant
- [ ] At a conference
- [ ] Colleague in my LHD
- [ ] Colleague from another public health agency
- [x] E-Mail from NACCHO
- [ ] Model Practices Brochure
- [ ] NACCHO Connect
- [ ] NACCHO Exchange
- [ ] NACCHO Exhibit Booth
- [ ] NACCHO Website
- [ ] Public Health Dispatch