

Master of Public Health
Integrative Learning Experience Report

***CREATION OF A CASPER SURVEY PROTOCOL FOR USE IN
RILEY COUNTY, KANSAS***

by

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submitted in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

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Summary

The Centers for Disease Control (CDC) developed the Community Assessment for Public Health Emergency Response (CASPER) survey toolkit as a standardized two-stage cluster sample method for rapid needs assessments. The CASPER survey was originally intended to assist in the collection of public health data in times of emergency, such as natural disasters, but it has also been used to collect health data in non-emergency situations. This includes the collection of data to inform Community Health Improvements Plans (CHIP). The primary objective of this collaborative group project was to adapt the CASPER toolkit for use in Riley County, Kansas. The adapted protocol was to be created by the efforts of a collaboration with the Riley County Health Department (RCHD), but it was intended for use by both RCHD and community partners wishing to collect community health data within the county. The protocol creation began with literature review to gain a better understanding of a full CASPER process. Literature reviewed included the CDC CASPER toolkit as well as published CASPER reports from health departments in Texas and Montana. During literature review, the CDC was also contacted for clarifications and assistance using the official email set up by the CDC for CASPER assistance. After sufficient literature was reviewed, supplementary protocol documents were produced by the Master of Public Health (MPH) students collaborating on the project. These documents were intended to provide templates and guides to assist future CASPER organizers in preparing, conducting, and reporting the completed CASPER process. Following the document preparation, the students planned and organized a test run of the CASPER protocol. The test survey was intended to be at least a 10% scale of a full CASPER in order to provide an efficient practice run with limited time and resources. Four clusters, predetermined areas defined by US Census blocks, within Manhattan were selected to simulate a random selection of clusters from the full list of Riley County's census blocks. Volunteers for conducting the survey were gathered from Kansas State University (KSU) students involved in the MPH program and personal contacts of the students involved in the survey organization. The templates and guides were then compiled into a comprehensive guide for Riley County and presented to RCHD. The students also presented their protocol and work to the Flint Hills Wellness Coalition to promote its use among community partners.

Subject Keywords: CASPER, Survey, Protocol, Development

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Chapter 1 - Literature Review

Rapid needs assessments are often used as a method to quickly assess the needs of a population or community, especially in an emergency situation. The CASPER protocol was created by the CDC in the late 2000s as a standardized method of conducting a rapid needs assessment.¹ The CASPER methodology and toolkit were created in response to the growing popularity of the two-stage cluster method for rapid needs assessments.¹ The two-stage cluster method involves the random selection of a set number of clusters, typically US Census blocks, within a defined survey area, then randomly selecting a set number of households within those randomly selected clusters.¹ The data collected in a CASPER survey is intended to be representative of the entire survey area.¹

The CDC CASPER toolkit separates a CASPER survey into four separate phases: planning, conducting, analysis, and reporting.² The planning phase of a CASPER involves selecting thirty clusters randomly, preparing volunteer materials, and communicating with the target community. Conducting the CASPER includes the coordination of volunteers to visit the chosen clusters to conduct seven surveys in each of the thirty clusters.² The analysis phase is fairly straightforward; the CDC provides certain formulae for CASPER-specific calculations in the CASPER toolkit.² The reporting phase represents the culmination of all three previous phases and should present a final report on the data collected during the survey and its implications. CASPER surveys are considered a sound method of conducting a two-stage sampling survey due to the fact that each cluster has an equal chance of being selected in the first stage of sampling.^{1,2} Use of a random number generator to select clusters without replacement helps to prevent selection bias, which would prevent the collected data from being truly representative of the population. Selection of households in the second stage of sampling during the surveying phase is performed using a method provided by the CDC.² Volunteers are instructed to approximate the number of households in a cluster, then divide that number by 7 to calculate the n for that cluster.² The volunteers are then to survey every n th house.² The number seven was selected to ensure that the surveys in each cluster are spread evenly throughout the cluster. This process ensures that the CASPER provides a representative sample of the entire area surveyed.¹

The CASPER methodology and toolkit were originally designed for use in disasters or other public health emergencies; however, the CASPER survey tool has been used in both emergency and non-emergency situations.¹ The primary objective of the project with RCHD was to produce an adapted protocol specifically for use within Riley County, Kansas. While the CDC

provides an extensive CASPER toolkit, the size and amount of detail of the toolkit can be intimidating to novice CASPER coordinators. Other health departments, including a group of health departments in Texas, have noted that it can be beneficial to create and retain supplementary materials to complement the CDC's CASPER toolkit.^{3,4}

RCHD selected the CASPER toolkit due to its ability to quickly generate community health data as well as its format being designed for local health departments. RCHD is considered a mid-sized local health department with the cities of Riley, Manhattan, Ogden, Randolph, and Leonardville under its jurisdiction.⁵ RCHD intended for the CASPER survey to be used within the county for emergency response as well as community health monitoring and improvement. A major anticipated product of RCHD's future CASPER surveys is data to inform CHIPs to help improve health in Riley County.

RCHD also works closely with the Flint Hills Wellness Coalition, including multiple RCHD employees as members of the coalition. There is not currently a position within RCHD or the Flint Hills Wellness Coalition dedicated to performing community health surveys such as the CASPER. A secondary goal of this project was to encourage support for and interest in the CASPER process from the Flint Hills Wellness Coalition as well as the community of Riley County. This goal was intended to encourage a greater use of the created protocol by RCHD as well as community partners such as the Wellness Coalition.

While working with RCHD, I specifically worked with Mr. Ed Kalas. During the majority of the project, Mr. Kalas was employed as the Health Educator and Accreditation Coordinator for RCHD. Mr. Kalas's responsibilities in these positions included ensuring that the health department stayed up to date on accreditations, designing community health outreach programs, and collaborating with community partners on health improvement plans for the county. Mr. Kalas obtained an MPH degree from the University of Oklahoma in 1996 and has worked in numerous public health positions in the past. Mr. Kalas has helped multiple KSU MPH students complete their field experience projects in the past, including one project involving the use of the CASPER toolkit in Shawnee County, KS.

Chapter 2 - Learning Objectives and Project Description

The primary learning objective of this project was an increased familiarity with and understanding of the CASPER toolkit and how to perform a CASPER with a local health department. Other learning objectives included the utilization of resources within a local health department and its community, increasing knowledge in community surveying, and protocol creation. The main expectation for this project was the completion of a thorough, comprehensive protocol for performing a CASPER in Riley County, Kansas. Other expectations included a trial run of the protocol once it was completed, a presentation on the protocol to the Flint Hills Wellness Coalition, and presentations at symposia for student projects and public health research.

This project was a collaborative group project involving a total of five MPH students under Mr. Kalas's direction. During this project, all group members were responsible for reading and summarizing relevant literature such as prior CASPER reports, attending weekly group meetings, and producing templates and guides for their respective sections of the CASPER protocol. My personal responsibilities for this project primarily involved the preparation phase of the CASPER as well as coordinating the trial run of the protocol. My focus on the preparation phase involved the creation of templates for press releases, basic introductory scripts for CASPER surveys, and other materials that can be reused in all future CASPER surveys. Many of these templates were based on the resources available from the CDC and other CASPERs previously conducted by other local and state health departments.

As a major part of the culmination of this project, we planned a trial run of our protocol. This trial was set at 10% of a standard CASPER. Only 21 households within Manhattan, Kansas were intended to be surveyed. The trial was originally intended to be carried out on November 28, 2020; however, the trial was rescheduled to January 9, 2021. My responsibilities for this trial run included gathering volunteers, preparing most materials to be used, coordinating with community partners such as the Riley County Police and the KSU MPH program, and leading efforts of both the project group and the volunteers, including just-in-time training. During the trial CASPER, we decided to include a fourth survey due to the number of volunteers that signed up to participate. Our goal for surveys was 28 households with 7 households in each cluster.

Chapter 3 - Methodology and Results

The survey protocol creation and trial run provided a small amount of data relevant to responses and contact rates. We carried out the trial survey fully knowing that the data collected would not be representative of Manhattan as a whole. Four clusters that were selected rather than randomly sampled would provide neither a large enough sample size nor true randomness. It is important to distinguish that in a true CASPER, each cluster within the sample frame would have an equal chance of being selected. This deviation from the written protocol was planned due to time constraints and lack of representation, thus affecting data analysis by introducing selection bias.

Following data collection, the data was transferred to a database and then converted into a different file format. Contact rates, cooperation rates, and completion rates (Table 3.1) were calculated as the primary method for evaluating the success of the survey. The calculated rates indicated a lack of preparedness in the community but a high willingness to participate. It appeared that the community may not be familiar with surveys; however, the willingness to participate indicated that most of the community would be open to future surveys provided they are made aware of them beforehand. Consideration was also given to the fact that the trial survey had an accelerated timeframe compared to the CDC's recommendation of multiple survey days, which would affect the ability to collect the target number of surveys.

Table 3.1: Calculation of Contact, Cooperation, and Completion Rates

Rate	Formula	Data Collected	Result
Contact Rate	$\frac{\text{Completed interviews}}{\text{All attempted households}}$	22/51	43.14%
Cooperation Rate	$\frac{\text{Completed interviews}}{\text{All contacted households}}$	22/23	95.65%
Completion Rate	$\frac{\text{Completed interviews}}{\text{Surveys needed to complete}}$	22/28	78.57%

Per the CDC CASPER manual, standard procedure for a full CASPER is to weight collected data by cluster in order to account for different cluster sizes.² However, it is also noted by the CDC that surveyors should perform an unweighted analysis for completion rates under 80%.² Since the achieved completion rate fell short of 80%, an unweighted analysis was performed. Multiple attempts were necessary due to complications with Epi Info as a data analysis software. The data was not meaningful to the survey due to the small sample size;

however, the analysis step was key to test the full planned protocol. During the analysis phase, it was noted that Epi Info created difficult situations due to its specific data file format and challenges in the import of data. The most crucial findings from the analysis of the data collected in the test survey were that Epi Info is not conducive to data analysis, nor is it efficient for data importing.

Following the trial survey, an analysis was conducted to synthesize observations (Table 3.2) regarding the effectiveness and overall strength of the protocol that was tested. From these observations, recommendations (Table 3.3) were produced for future CASPER organizers to help improve surveys. The protocol was also improved by the observations (Table 3.4) to include a section about publicity and updates regarding the choice of survey and data analysis software.

Table 3.2: Trial CASPER Observations and Impacts

<u>Observation</u>	<u>Impact</u>
Survey creation in Epi Info software perceived as difficult by beginner users	Removed recommendation for survey creation in Epi Info from protocol
Links to geographical information software and US Census Bureau data and maps in CASPER toolkit are outdated	Current links compiled in a document to be included as part of the CASPER protocol packet
Volunteers for trial survey indicated strong understanding of CASPER concepts and how to perform a CASPER survey	Reinforced the strength of the training presentation provided by the CDC, training presentation included in protocol packet
Low contact rates in Manhattan clusters, especially in apartment buildings	Encouraged consideration of survey date and effects of KSU schedule on student presence
Surveyed residents refused to answer questions or provided answers not included on survey	Added recommendation to include “refused to answer” and “other” answer responses for future surveys

Table 3.3: Recommendations for Future CASPERs

<u>Recommendation</u>	<u>Intended Effect</u>
Do not utilize Epi Info software without prior experience	Encourage CASPER organizers to use programs that are more user-friendly and do not require higher levels of technical expertise
Engage in communication with target community early and often	Allow target community ample time to prepare for CASPER and understand survey goals
Ensure “refused to answer” and “other” options are present on surveys	Allow CASPER organizers to collect accurate data
Ensure that volunteers use electronic <i>and</i> physical forms of surveys	Add redundancy to prevent loss of data due to technology failures
Utilize all options for documentation and personnel	Encourage CASPER organizers to be aware of all possibilities for resources available

Table 3.4: RCHD CASPER Protocol Before and After Trial

<u>Before</u>	<u>After</u>
Utilized Epi Info as survey creation, data collection, and analysis software	Recommended use of programs such as Qualtrics or Google Forms for survey creation and data collection, recommended use of Microsoft Excel for data analysis
Did not consider adding “refused to answer” and “other” answer options	Specifically instructed survey creator to include “refused to answer” and “other” options on future surveys
Did not fully emphasize the importance of social media and local news advertisement	Specifically included a section regarding the importance of publicity before a CASPER
Relied on links in CASPER toolkit for US Census data and mapping software	Included a list of current links to necessary websites for mapping and census data
Attempted to create training presentation template from scratch	Emphasized strength of CDC-provided training presentation template

Chapter 4 - Discussion

This experience provided extensive exposure to the use of two-stage cluster sampling, specifically with the CASPER toolkit. Many observations were made regarding the overall CASPER process and the steps taken to conduct the trial CASPER. From these observations, we were able to synthesize a list of recommendations for organizations that may conduct future CASPERs in Riley County. We were also able to further improve our CASPER protocol based on the findings of our trial CASPER and literature review. Additionally, we learned many lessons on how to conduct community surveys of any kind for future endeavors, as outlined below.

The main lesson learned regarding CASPERs is that surveyors must be very careful with the survey method that they choose. We had selected Epi Info as the survey platform for our trial CASPER due to its ability to collect and analyze data all within one application. Despite the perceived ease of access, we quickly found that Epi Info requires a high level of technical knowledge as well as proficiency with data manipulation and programming. Epi Info also offers a mobile app companion; however, this mobile app was only compatible with Apple phones. This limitation is a severe limitation if volunteers do not have Apple phones. Our use of Epi Info caused difficulties in data retrieval and analysis due to the format in which the program saves survey data. These difficulties caused us to rely more on the paper copies of the surveys, which would not be feasible in a full CASPER with 210 surveys as recommended by the CDC.

Another major lesson learned regarded the logistics of communication surrounding a CASPER. We had originally intended to carry out an extensive social media campaign that would be accompanied by press releases. However, the timing of the survey caused holidays and other circumstances to interfere with our plans for advertising the upcoming survey. The advertisement of the CASPER instead involved multiple organizations sharing a social media post regarding the CASPER survey. A more thorough communication strategy may have caused the contact and cooperation rates to be higher. Better communication for future CASPER surveys would include press releases before surveying and after report publication as well as social media posts and advertisements in local papers.

Bias and survey structure must also be considered when conducting a CASPER survey. Selection bias was introduced into the trial survey by a planned failure to follow protocol regarding random selection of clusters. However, other types of biases may be introduced through the structure of questions on a survey and the method in which they are asked. Different types of information bias, such as interviewer bias and recall bias, may be introduced during the process of asking questions in the field. Interviewer bias may be introduced if the

volunteers overemphasize certain questions, deviate from the survey questions, or attempt to follow up on an answer without a planned follow up question. Recall bias may be introduced by interviewees when asked questions about a possible risk due to exposure or about factors that have not been encountered recently.

In order to control for biases, survey organizers must be very careful when creating their survey and providing training to volunteers. Selection bias may be prevented by adhering to the random selection protocol; interviewer bias may be reduced by instructing volunteers on best data collection methods and stressing the importance of remaining within the boundaries of the survey while emphasizing each question equally. Recall bias is more difficult to control, but it may be reduced by asking residents questions about recent or significant factors without overemphasizing the importance of these factors.⁶ Interviewer bias may also be affected by ensuring that survey questions do not lead the resident to a specific answer.

This project provided excellent insight into the challenges of survey creation and structure. The first challenge for survey creators is deciding the type of qualitative data to collect. Most data collected in the trial survey was either binary or nominal. These two data types are prominent in surveys such as CASPERs, and they are analyzed in different ways. Binary data may be analyzed with a z-test, while nominal data requires categorization into subsets before analysis with a chi-square test. Different questions will provide these different data types; for example, a yes-or-no question would provide binary data, while multiple choice questions would provide nominal data for answers with no specific order. Survey creators may also choose to create ranked choice questions using a scale such as a Likert scale; this data type would require each answer to be assigned a numerical value for analysis.^{6,7}

Due to the challenges surrounding bias and different analysis types, it is important for survey creators to consider factors such as question design, answer order, and interview methods. When designing questions, surveyors should first consider the data they wish to obtain.⁷ This helps to begin forming the structure of each question. The next consideration for questions is preventing bias; unbiased questions should avoid leading the interviewee to an answer and should be asked in the same manner during every interview. Survey creators should also consider saving controversial or emotion-based questions for later in the survey to ensure better data collection in the first portion.⁷ Due to different volunteers being responsible for different clusters, there will always be some slight variation with interviews. This increases the importance of stressing standardization when training volunteers for interviews.

The order in which questions are asked is also a significant factor in creating a survey. Demographic questions are typically found at the beginning of surveys; however, this may

cause the interviewee to lose interest in the interview and provide less-useful answers or even refuse to answer questions.⁷ It may be beneficial to ask demographic questions at the end of a survey in order to collect more data that is less affected by recall bias.⁷ Some questions may influence answers on other questions, especially if the survey is regarding a risk factor or exposure. To avoid bias from these questions, any question that they may affect should be asked first. Additionally, these questions must be worded very carefully in order to prevent leading the interviewee to an answer.^{6,7} While this may not always be possible, it should always be attempted to prevent bias.

Overall, this project allowed for all involved to learn a significant amount regarding the CASPER toolkit. An important benefit of this experience was that the community gained a slight exposure to community surveys, especially CASPERs. Riley County generally does not have much experience with door-to-door surveys such as the CASPER. This protocol creation and trial survey allowed for residents in Manhattan to gain a small amount of experience with how CASPERs work and how to familiarize themselves with the process.

The CASPER survey tool is an efficient form of a rapid needs assessment that allows for representative data to be collected for community interventions to be immediately implemented. This project provided excellent experience for all involved, both students and health department employees. All involved learned more about the methodology of CASPER surveys as well as how to conduct a CASPER survey. It is anticipated that the products of this experience will be used by RCHD and community partners to improve community health in Riley County. The best outcome would be for the created protocol and templates to be used and improved upon for years to come.

Chapter 5 - Competencies

Student Attainment of MPH Foundational Competencies

This project was heavily focused on the adaptation of a comprehensive guide into a simplified protocol for use in Riley County, Kansas. Based on the needs of Riley County and the RCHD, it was important for this project to focus on assessing community health needs and assets. Creation of the RCHD-specific protocol required constant consideration of assets available within the county as well as reasons for conducting a CASPER survey within Riley County. Many of the lessons learned from this experience stemmed from literature review and hands-on practice in preparing and conducting the trial survey.

As has been previously stated, rapid needs assessments such as the CASPER are efficient and effective ways to gather data regarding community health. By learning the CASPER methodology and how to adapt said methodology for Riley County, I was able to help create a community-specific protocol that can rapidly assess community health. This directly addresses the seventh of the MPH core competencies, which is the assessment of population needs, assets, and capacities that affect community health. I was able to both reinforce and apply this competency through careful analysis of the CASPER toolkit and preparation of a CASPER protocol that would be tested in Manhattan.

The creation of the CASPER protocol for RCHD also helped to reinforce the ninth MPH core competency in that I helped to design a population-based survey program. The CASPER protocol delivered to RCHD was specifically designed so that anyone within the health department or a partner organization could conduct a CASPER. When creating the protocol, factors such as student housing and local resources were given consideration in addition to factors that the CDC recommended. The protocol for Riley County CASPER surveys is specifically designed to provide templates and guides for future CASPER surveys that are easy to understand when given to a wide audience such as the Flint Hills Wellness Coalition.

By performing a trial run of our CASPER protocol, we were able to address the eleventh MPH core competency, selecting methods to evaluate public health programs. The results of the trial CASPER helped to shape the final protocol, which we intend to help shape CHIPs. The selection of this method was already performed by Mr. Kalas and RCHD, but this project helped me to understand the relationship between the CASPER and the CHIP. Through literature review and hands-on experience with planning a CASPER, I gained a better understanding of how a CASPER can provide pertinent data related to community health. My final guide to a CASPER process included an optional step to use CASPER data in a CHIP due to the ease of

transition from one process to the other. While this project focused almost entirely on the CASPER protocol, we were constantly considering the possibility that this protocol would be used for CHIPs.

This CASPER protocol was primarily intended for use by RCHD, but it was also meant to be available to any stakeholder in community health within Riley County. These community partners included a wide variety of professions and backgrounds, which meant that the protocol must be understandable to stakeholders who may not have a high level of technical education in public health and community surveys. The process of creating a protocol for a diverse and multidisciplinary audience emphasized the twenty-first MPH core competency, performing effectively on interprofessional teams. This portion of the project culminated in a presentation of our work to the Flint Hills Wellness Coalition. The Coalition was the most important secondary audience due to its wide range of health-related community partners. The presentation included findings from the trial survey and an overview of our protocol in a manner that was intended to be easy to comprehend and to encourage further use of the protocol in Riley County.

One key step in creating the first phase of the CASPER protocol was the consideration of all resources that were available within Riley County. While the protocol was to be delivered to RCHD, there are far more resources available than those that RCHD possesses. My structure for the preparation phase helped me to address the twenty-second MPH core competency, applying systems thinking to a public health issue. Part of creating the preparation protocol involved the assembly of a list of community resources for publicity, volunteers, and reporting. This list included local television and radio stations, newspaper editors-in-chief, public information officers, and volunteer organizations. It was important to consider the entire system that RCHD operates within in order to create a comprehensive preparation guide that provides extensive options for all steps of preparing for a CASPER. Emphasis was placed on considering all options for resources within Riley County so that both the community and the surveyor or surveying organization are fully prepared for the survey.

Table 5.1 Summary of MPH Foundational Competencies

Number and Competency		Description
7	Assess population needs, assets and capacities that affect communities' health	Creation and use of a CASPER protocol for Riley County, Kansas
9	Design a population-based policy, program, project or intervention	Designing a county-specific CASPER protocol, tailored to the needs of the Riley County Health Department and community partners
11	Select methods to evaluate public health programs	Use of trial CASPER results to influence program direction, including integration with a Community Health Improvement Plan
21	Perform effectively on interprofessional teams	Creating protocol to be used by wide variety of professionals, including the Flint Hills Wellness Coalition and Riley County Health Department
22	Apply systems thinking tools to a public health issue	Consideration of all resources, contacts, and programs when creating protocol

Below is a list of the 22 Public Health Foundational Competencies, the competency number, the courses they are taught in to facilitate completing the table above.

Table 5.2 MPH Foundational Competencies and Course Taught In

22 Public Health Foundational Competencies Course Mapping	MPH 701	MPH 720	MPH 754	MPH 802	MPH 818
Evidence-based Approaches to Public Health					
1. Apply epidemiological methods to the breadth of settings and situations in public health practice	x		x		
2. Select quantitative and qualitative data collection methods appropriate for a given public health context	x	x	x		
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	x	x	x		
4. Interpret results of data analysis for public health research, policy or practice	x		x		
Public Health and Health Care Systems					
5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings		x			
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels					x
Planning and Management to Promote Health					

22 Public Health Foundational Competencies Course Mapping	MPH 701	MPH 720	MPH 754	MPH 802	MPH 818
7. Assess population needs, assets and capacities that affect communities' health		x		x	
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs					x
9. Design a population-based policy, program, project or intervention			x		
10. Explain basic principles and tools of budget and resource management		x	x		
11. Select methods to evaluate public health programs	x	x	x		
Policy in Public Health					
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence		x	x	x	
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes		x		x	
14. Advocate for political, social or economic policies and programs that will improve health in diverse populations		x			x
15. Evaluate policies for their impact on public health and health equity		x		x	
Leadership					
16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making		x			x
17. Apply negotiation and mediation skills to address organizational or community challenges		x			
Communication					
18. Select communication strategies for different audiences and sectors	DMP 815, FNDH 880 or KIN 796				
19. Communicate audience-appropriate public health content, both in writing and through oral presentation	DMP 815, FNDH 880 or KIN 796				
20. Describe the importance of cultural competence in communicating public health content		x			x
Interprofessional Practice					
21. Perform effectively on interprofessional teams		x			x
Systems Thinking					
22. Apply systems thinking tools to a public health issue			x	x	

Student Attainment of MPH Emphasis Area Competencies

Some of the Infectious Disease and Zoonoses competencies were helpful when considering the CASPER protocol creation process. The competencies most prominently utilized during this experience were the competencies addressing environmental or ecological influences on disease as well as disease surveillance. The competencies addressing pathogens and their mechanisms, disease vectors, and host responses to pathogens were mostly addressed and reinforced during classroom learning. However, it is important to consider that a

CASPER survey may be used to address any of the Infectious Disease and Zoonoses competencies by surveying a community regarding the effects, risks, and causes of a disease.

The most prominent application of these competencies was the use of the proposed CASPER protocol to gather responses regarding COVID-19. The trial survey utilized a small number of questions regarding COVID-19 to demonstrate the CASPER's usefulness in collecting health data during a pandemic. Even though the data collected was not a representative sample, the CASPER methodology proved to be a reliable tool to quickly obtain data in a time-sensitive period. This helped to reinforce the competency addressing disease surveillance by demonstrating the usefulness of a rapid needs assessment in public health emergencies.

Another application of a competency was the planning of the CASPER trial. Part of preparing to conduct a CASPER involved literature review of published CASPER reports to gain a better understanding of the full CASPER process. This literature review helped to widen my view to include environmental factors that could affect both the survey conduct and the survey structure. Survey questions included questions regarding internet use and pre-existing chronic health conditions in order to include data collection for risk factors for COVID-19 and the manner in which residents could gain information about COVID-19. Previous ideas for survey questions had been narrowly focused on COVID-19 testing and basic demographics. Literature review and thorough planning helped to emphasize the effects that the physical and digital environments could have on the spread of COVID-19.

The rest of the competencies not directly addressed by my experience with the CASPER methodology were better addressed in classes taken before or at the same time as the project. Specific classes that helped to address competencies included Veterinary Virology, Veterinary Bacteriology and Mycology, and Emerging Diseases. Veterinary Virology was the only class of the three taken prior to the project beginning. These classes all addressed various factors of diseases, including the pathogens causing a wide variety of diseases and their pathogenicity mechanisms, how hosts respond to and combat pathogens, and how vectors can play a major role in the spread of disease.

Table 5.3 Summary of MPH Emphasis Area Competencies

MPH Emphasis Area: Infectious Disease and Zoonoses		
Number and Competency		Description
1	Pathogens and pathogenic mechanisms	Evaluate modes of disease causation of infectious agents.
2	Host response to pathogens/immunology	Investigate the host immune response to infection.
3	Environmental and ecological influences	Examine the influence of environmental and ecological forces on infectious diseases.
4	Disease surveillance	Analyze disease risk factors and select appropriate surveillance.
5	Disease vectors	Investigate the role of vectors, toxic plants and other toxins in infectious diseases.

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Appendix

Appendix A. CASPER Introduction and Consent Script Template



Riley County Health Department

Community Assessment for Public Health Emergency Response (CASPER)

Hello, my name is _____ and this is _____. We are with the Riley County Health Department. We are conducting a community survey with randomly selected households to gain more information on [insert topic].

- Your house is one of the households that was randomly chosen to be contacted about this survey
- If you agree to participate, we will not ask any personal questions and we will not take any identifying information- these questions will be about your entire household
- This survey should take no more than 10-20 minutes to complete. The survey is completely voluntary and anonymous, and your answers will be kept private.
- (Optional) We also have some information that we would like to leave with you that may be of interest to you or others living here. *Hand them any informational materials.*
- If you have any questions regarding the survey, you can contact the survey coordinator (Insert Survey Coordinator contact info)

Wait for a clear "Yes" or "No" response for each question!

Would you or any other adult resident here be willing to participate in this survey?

Do you live in this home?

- If "No": Is there someone else who does live here that we can speak to?

Are you at least 18 years of age or older?

- If "No": Is there someone else who is 18 years old or older who lives here that we can speak to?

If any of the questions above are met with a "No", thank them for their time and follow procedures for selecting a new household.

Health Department
Clinic and Administration Office
2030 Tecumseh Road
Manhattan KS 66502
P: 785-776-4779
F: 785-565-6565

Health Department
Family & Child Resource Center
2101 Claflin Road
Manhattan KS 66502
P: 785-776-4779
F: 785-567-2879

Appendix B. CASPER Media Release Form

MEDIA RELEASE FORM

I, _____, grant permission to _____, hereinafter known as the "Surveyor" to use my image (photographs and/or video) for use in Surveyor's publications including:

(Check All That Apply)

- ☐ - Videos ☐ - Newsletters ☐ - Magazines ☐ - General Publications
☐ - Website and/or Affiliates ☐ - Other: _____

I hereby waive any right to inspect or approve the finished photographs or electronic matter that may be used in conjunction with them now or in the future, whether that use is known to me or unknown, and I waive any right to royalties or other compensation arising from or related to the use of the image.

Please initial the paragraph below which is applicable to your present situation:

_____ - I am 18 years of age or older and I am competent to contract in my own name. I have read this release before signing below, and I fully understand the contents, meaning and impact of this release. I understand that I am free to address any specific questions regarding this release by submitting those questions in writing prior to signing, and I agree that my failure to do so will be interpreted as a free and knowledgeable acceptance of the terms of this release.

Signature: _____ Date: _____

Name (please print): _____

Address: _____

Appendix C. CASPER Press Release Template



News Release

For Immediate Release: [Insert Date]

Contact: [Insert contact info of organizer]

CASPER Survey to assess [Insert CASPER topic]

MANHATTAN – The Riley County Health Department (RCHD) is conducting a Community Assessment for Public Health Emergency Response (CASPER) survey to assess [Insert CASPER topic].

Survey members will go door-to-door from [insert date range of CASPER] within pre-selected areas of [insert CASPER area: Riley County, Manhattan, etc.]. Seven houses within each area will be systematically selected and surveyed.

Survey teams will be primarily composed of RCHD staff and volunteers from [list volunteer sources].

Selected households will be surveyed regarding [list topics on questionnaire]. Team members will carry identification cards issued by RCHD. All survey responses will be kept confidential, and no names or personal identifying information will be collected.

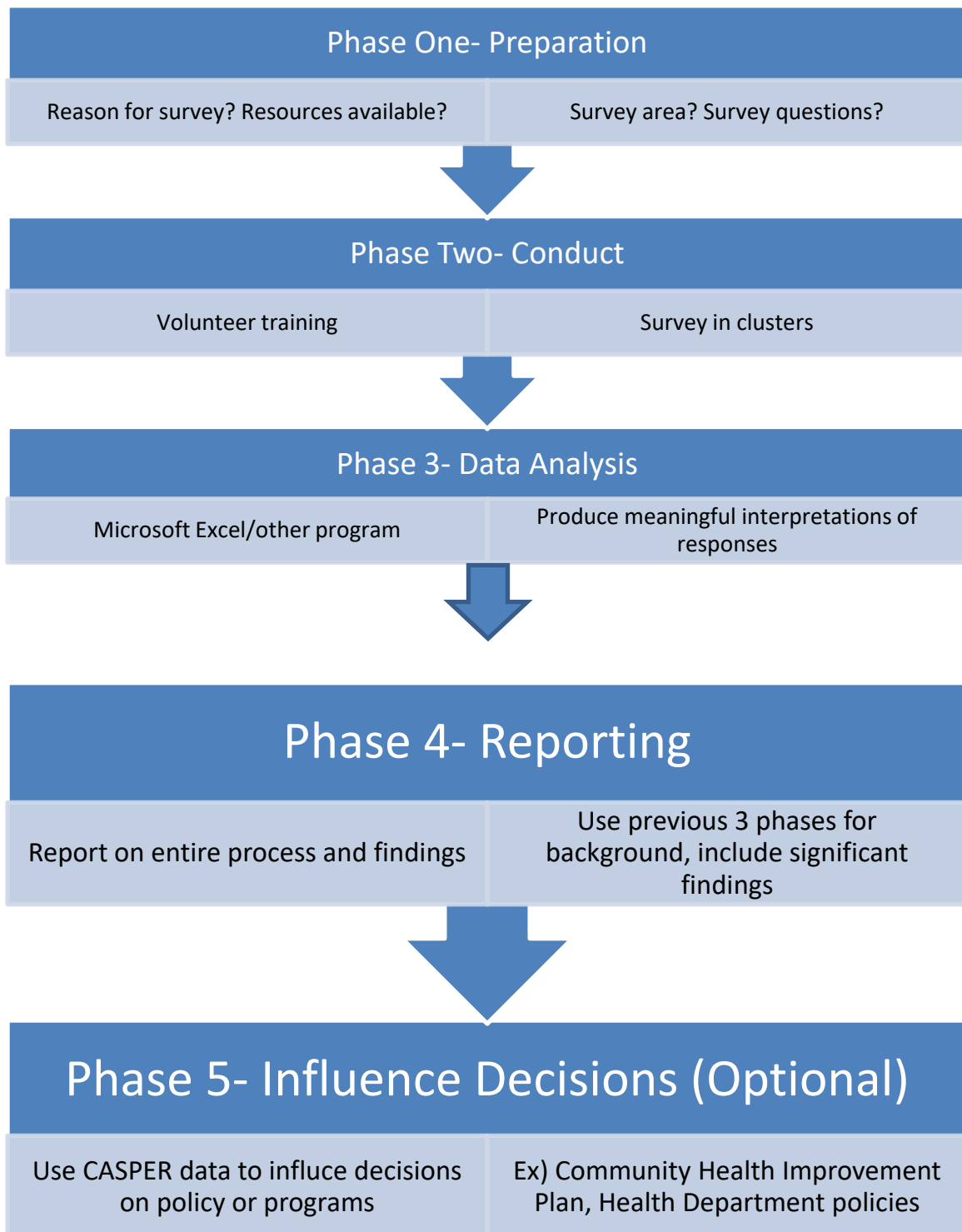
This survey will be used to [fill in how survey will be used: CHIP, emergency preparedness, etc.].

The CASPER survey was developed by the Centers for Disease Control and Prevention as a way to rapidly assess the health and resource needs of a community after a disaster. However, this survey method can also be used in a non-disaster scenario in order to rapidly survey a large community.

Health Department
Clinic and Administration Office
2030 Tecumseh Road
Manhattan KS 66502
P: 785-776-4779
F: 785-565-6565

Health Department
Family & Child Resource Center
2101 Claflin Road
Manhattan KS 66502
P: 785-776-4779
F: 785-587-2879

Appendix D. CASPER Preparation Flowchart



Appendix E. CASPER Resource List

CASPER Volunteer Sources

- Kansas State University SORT (MPH/DVM students)
- Riley County Medical Reserve Corps
- Kansas State University Staley School of Leadership
- RCHD Employees/Family
- City of Manhattan Employees/Family

CASPER Publicity Contacts (as needed)

- Local radio stations- KMKF, KMAN, KACZ
- Manhattan Mercury- Ned Seaton (Editor in Chief)
- Kansas State University Collegian
- Local news stations- WIBW, KSNT
- Riley Countian

CASPER Cooperating Agencies/Bodies

- City of Manhattan- Vivienne Uccello, phone # (785)-587-2410
- City of Leonardville
- City of Randolph
- City of Riley
- Flint Hills Wellness Coalition
- Riley County Police Department

CASPER Assistance

- Centers for Disease Control CASPER Technical Support (CASPER@cdc.gov)

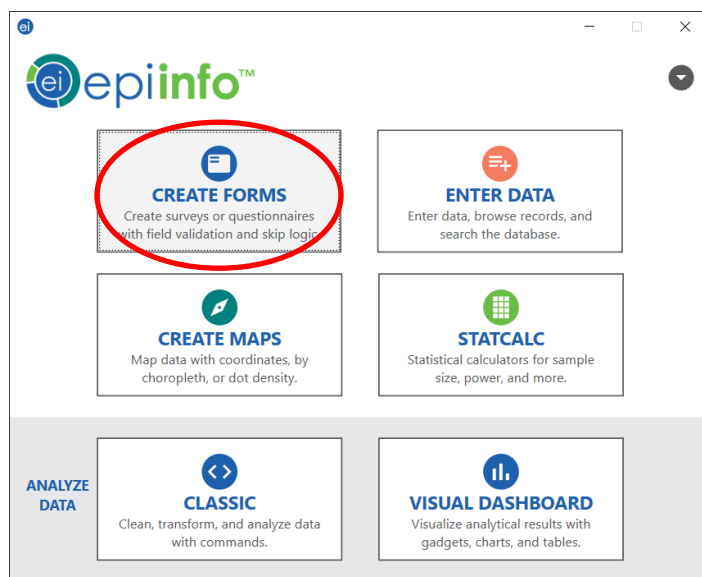
Appendix F. Epi Info 7 Guide

Introduction

Epi Info 7 is the most recent version of the Epi Info tool provided for free by the Centers for Disease Control (CDC). Epi Info works with Windows computers and Android/iOS mobile devices, and the system has also been adapted for use via web and cloud. Mobile devices may be used to collect data in the field, while desktop computers may be used to create surveys and analyze data that was synchronized from field collection. This guide is intended to provide assistance in creating and using surveys with Epi Info 7.

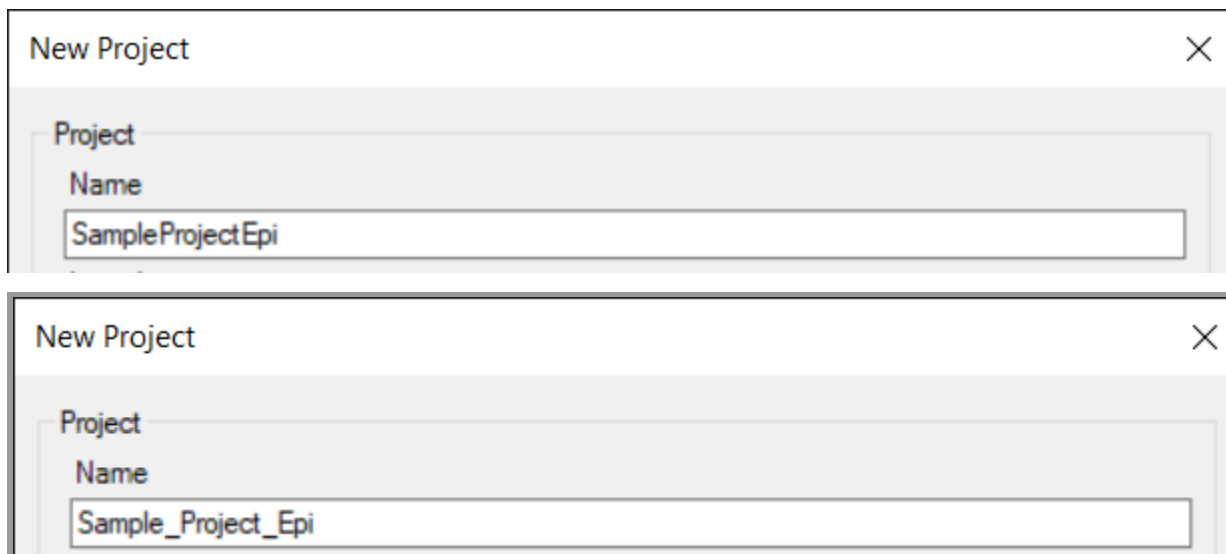
Creating a Project

From the main menu of Epi Info 7, select the “**Create Forms**” option.



Then, select the “**New Project**” option from the top menu bar. This will open a new window for you to name your project, select a location to save the project, create a description for your project, and name the form. Project and form names may not contain spaces or numbers. Replace spaces with underscores.

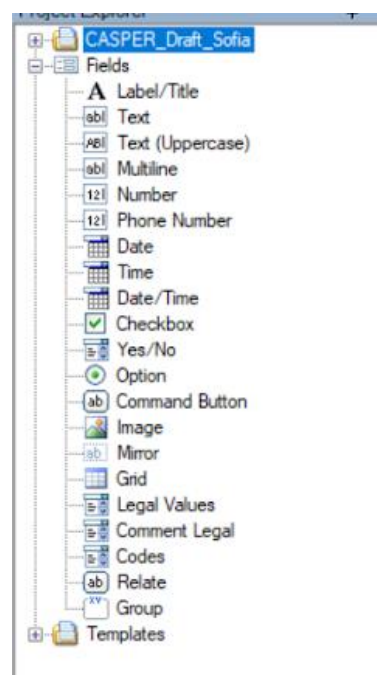
- Naming example: For a survey you would want to name “CASPER Survey 1” you would instead name it “CASPER_Survey_One” or “CASPERSurveyOne”. (see examples below)



Adding to a Project

Epi Info 7 offers many different options for form creation. It is recommended that you first create a title for your survey. Under the “**Fields**” folder in the left-hand menu, click and drag the “**Label/Title**” option to the place on the page where you would like to place it. This will bring up a window that allows you to type the title text (in the box labeled “**Question or Prompt:**”) and the name of this survey element (in the box labeled “**Field Name:**”). After a title, there are multiple options to create survey questions such as:

- **Checkbox:** Question with one check box. Can be used for prompts such as “Check box if...”
- **Yes/No:** Question with a drop-down menu to select yes or no.
- **Option:** Question with multiple options. You may increase the number of options to fit your needs. Options are listed next to a bubble that will be filled in during survey completion.



Each question option must be dragged into the survey like the title was. After dropping the template into the survey page, a window will appear to edit the element. The text of the question should go in the “**Question or Prompt:**” box, and the unique name for the element will go in the

“Field Name:” box. The field name will automatically fill in as the text of the question without symbols or spaces if you click in the **“Field Name:”** box. Each option for creating questions has some attributes that may be selected. “Read Only” will prevent data from being recorded in that question. “Required” will not allow the survey to be completed without filling in an answer for this question. This option is not recommended for CASPER surveys since some formats (“Yes/No” especially) do not allow for an option for the surveyed person to refuse to answer.

HOW TO USE FIELDS IN epiinfo

Riley County CASPER

Survey Date

Personal Information

How old are you?

What is your gender?

☐ Male

☐ Female

☐ Other

☐ Would rather not say

Household Information

How many people live in this household?

Is anyone in this household pregnant?

No

Are there any adults in your household that do not speak English?

☐ Yes ☐ No ☐ Don't Know ☐ Refuse to answer

If the answer was "Yes," what language do they speak?

Health concerns

Have you or a member of your household ever been told by a healthcare professional that he/she has:

☐ Asthma / COPD / Emphysema

☐ Diabetes

☐ Developmental disability

☐ Hypertension / Heart Disease

☐ Immunosuppression

☐ Physical disability

☐ Psychosocial / mental illness

☐ Seizure disorder / Epilepsy

Field Legend:

- Label / Title
- Date
- Group
- Number
- Option
- Yes / No
- Text
- Checkbox

Option is used when the answers are mutually exclusive. Selecting one answer will grey-out the rest of the possible answers.

Screenshot taken in Form Designer on EpiInfo.

Using Templates

There are templates and pre-made documents provided in Epi Info 7's basic files. To explore these projects and templates, click the "Open Project" option on the top menu. This will bring up a window that allows you to open other projects provided within Epi Info 7. Many of these will not be immediately useful in creating a CASPER survey, but they may provide examples for design ideas for your own survey.

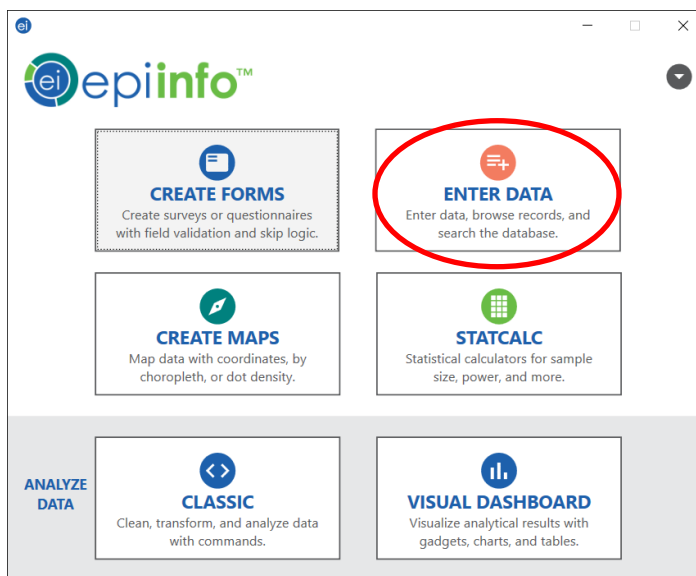
Make notes of elements of these surveys that you would like to recreate on your own documents.

Document Formatting

While surveys and documents within Epi Info 7 do not have many customization options, there are a few options to make your projects more professional. To create a background, first select the "**Format**" option from the top menu. In this menu, select the option "**Background**". From here, you may select different options for the background. You may upload a picture, choose whether the background applies to all pages in the document or just one, and choose a background color for your project. This is useful for adding logos for watermarks or creating a standard background color.

Data Entry

From the main menu of Epi Info 7, select the "**Enter Data**" option.



This option will allow you to enter new data, modify existing data, search for records, import data from other sources, and view/display forms that you have already created. In the workspace that appears, the pages of each form will be displayed on the left-hand side in a menu labeled “**Pages**”. Remember to check for additional pages, especially for CASPER surveys. Data will automatically be saved as it is entered. You may use the arrow buttons or text box next to the “**New Record**” option on the top menu to navigate to a specific record if you know its number. Importing data will have different methods depending on the manner of its collection. From an Android mobile device, Epi Info will require a sync file that the application creates. For data collected on a web browser via the Epi Info Web Survey feature, there are a few authentication factors required- a security token, the survey, and the organization keys. If you do not have these available, check with the survey creator or organizer. To import data from a form, you will need both the project (.prj) and the Microsoft Access Database files (.mdb).

Appendix G. CASPER Preparation Protocol

Riley County Community Assessment for Public Health Emergency Response (CASPER)

Manual

CASPER Phase 1: Preparation

- **Objective:** Planning and gathering materials/support for conducting a CASPER survey
- **Helpful Templates and Forms:** CASPER Press Release Template, CASPER/RCHD Worksheet, Epi Info 7 Guide, CDC CASPER Toolkit, Contact List for Riley County CASPER, CASPER Training Template

The first step in performing a CASPER survey must be a careful and thorough planning phase. Questions to ask when preparing a survey are: Where will the survey take place? Why does the survey need to take place? What questions will be asked? How will the public be made aware of the survey? The CASPER/RCHD Worksheet template can help with planning the details of the survey process. Products of the preparation phase should include the survey form, a publicity campaign, and plans and maps for the next phase.

It may be helpful to break down the CASPER team into specific roles for the different phases. Depending on the number of people within the command structure, it may be best to assign each member one or two roles within the phases of the CASPER. For the preparation phase, the following responsibility breakdown may help: one member responsible for survey creation, one member responsible for volunteer activities such as gathering volunteers and preparing training sessions, and one member responsible for publicity. Members may collaborate as necessary; however, dividing the major preparation tasks can help the team focus on each section better.

Publicity is a key component to planning a CASPER survey. Publicity campaigns should begin once the basics of the survey (topics, survey area, reason for surveying, etc.) have been finalized. The “Contact List for Riley County CASPER” form can help to provide a list of resources such as public information officers, newspapers, and TV or radio stations that can assist in broadcasting the upcoming survey. It is also recommended that the publicity campaign is accompanied by social media posts that can be shared by the public. It may also be helpful to hold town hall-style meetings in the survey area or on platforms such as Facebook Live. This

would give the community a chance to learn more about the CASPER process and what they can expect during the survey.

It is also important to begin gathering volunteers as early as possible, perhaps even as soon as the survey date is set. The Contact List form can help with volunteer sources, but there are a plethora of opportunities to gather volunteers from the community. Ads on social media or in local newspapers, word of mouth, and contacting local organizations can yield volunteers to help with the survey in Phase 2. The team member or members responsible for volunteer coordination should also begin preparing the training presentation for Phase 2 at this time. The CASPER Training Template PowerPoint file can help with this step. The template was created by the CDC to give volunteers a thorough understanding of the CASPER process and can be modified as needed.

One of the most important products of Phase 1 is the survey that will be used in Phase 2. There are many options for survey creation available. The trial run of a CASPER survey in Riley County utilized the CDC software Epi Info 7; however, this software is not recommended due to its high learning curve. If the survey team has experience with Epi Info in the past or wishes to attempt to use it, the Epi Info 7 Guide may be helpful at this step. The survey should include basic demographic questions regarding the household such as age ranges, number of residents, and chronic health conditions. These questions should appear on every CASPER survey regardless of the survey's focus. The second portion of the survey should be dedicated to the survey's focus.

Data collection methods must be considered when creating a survey. Performing a survey using pen and paper only can be helpful when technology is unavailable or unreliable, but it can also cause difficulties in data analysis and collection. It is recommended that surveys always have a printed version as well as an electronic version. Since the CDC recommends that volunteers operate in groups of two, this method allows one volunteer to collect data on a mobile device while the other collects data on the paper copy. This redundancy helps to prevent data loss in the case of technological errors.

When selecting clusters for surveys, it is suggested to first begin with all census blocks in the county. This can be done by using Geographic Information Software (GIS) provided by the US Census Bureau to create maps that break down the census tracts. This list of census blocks can then be exported to a spreadsheet that compiles all of the blocks into one file. It is important

to remember that all census blocks obtained from the GIS maps should have an equal chance of being selected in the survey, including the blocks with very few or no households. Blocks with seven or fewer households may be combined with their neighboring blocks into the census tract to ensure that at least 7 households are randomly selected for surveys. Once the list of blocks has been finalized, use a random number generator that can be found online to randomly select thirty blocks. If one cluster is selected multiple times, make a note of this so that volunteers can be notified to perform multiple rounds of surveys in that cluster.

The final steps for preparation are to ensure that the smaller details of the survey are considered. The volunteer training must be scheduled, the survey team must have an operations center, and all materials must be finished. If the survey is conducted by an organization that is able to provide its own facilities, a conference room is an excellent location for volunteer training and an operations center. Otherwise, a local community center or educational facility can provide excellent opportunities for holding meetings. Before moving on to Phase 2, ensure that all materials for volunteers are printed and all who may be affected by the survey have been notified. This includes the community being surveyed, local law enforcement, and volunteers.

CASPER Phase 2: Conduct

- **Objective:** To carry out the survey portion of the CASPER process in an efficient and thorough manner
- **Helpful Templates and Forms:** Epi Info 7 Guide, CASPER Confidential Referral, CASPER Consent and Intro Script, CASPER Media Release Form, CASPER Tracking Form, CASPER Training Template, CASPER Volunteer Badges, CDC CASPER Toolkit

Phase 2 of a CASPER survey involves just-in-time training for volunteers followed almost immediately by the first round of surveys. It is recommended that a full CASPER survey be scheduled for multiple days, possibly over multiple weeks. Varying the time and day of the week that volunteers attempt surveys can increase the chances of obtaining the full 210 surveys suggested by the CDC. Weekends are excellent days to attempt surveys since the majority of the population tends not to work on the weekend. Mornings and evenings are the best choices for times of the day to attempt surveys as well.

At the just-in-time training, volunteers should be given some form of identification so that residents can easily identify them. Some CASPER teams in other states have used T-shirts for identification, but teams may also use printed ID cards such as the ones provided in the CASPER Volunteer Badges template. Volunteers should also be provided with their packets for the day. Each packet should include the following materials:

- Maps of each cluster the volunteer group has been assigned- ensure the cluster is clearly marked on the map
- 7 paper copies of the survey for each cluster the group has been assigned
- A tracking sheet (CASPER Tracking Form template) for each cluster the group has been assigned
- One consent script (CASPER Consent and Intro Script template) per volunteer
- Optional: Confidential referral forms (CASPER Confidential Referral template) if the survey is intended to distribute information about local health resources- number given may vary
- Office supplies such as pens/pencils and clipboards
- Media release forms (CASPER Media Release Form template) for volunteers to sign if they consent to their likeness being used in promotional materials or reports

As long as volunteers are in the field conducting surveys, at least one command team member must be available as a contact for the volunteer groups. If the chosen survey software is able to transmit data in real time, other command team members may be able to begin consolidating data to prepare for analysis. Once volunteers have left the field for the day, ensure that all groups check out and return their supplies until they return for the next survey day. Survey forms can then be collected and compared to the data collected digitally to ensure that there are no discrepancies.

While the CDC recommends that a CASPER survey should yield 210 completed surveys, this is often not achievable. The CDC states that a completion rate of no less than 80%, which converts to 168 surveys at minimum. Make note of any inaccessible households or refusals on volunteer tracking sheets and ensure that volunteers are familiar with the CDC's method for replacing households. Volunteers should also have multiple opportunities to attempt surveys at households. Based on the recommended survey date format, surveys should take place on at least three days.

Appendix H. Analysis of Test CASPER Survey

Analysis of Riley County Health Department Community Assessment for Public Health Emergency Response (CASPER) Trial

Jason DeFisher

Introduction

The Community Assessment for Public Health Emergency Response (CASPER) survey tool was designed by the Centers for Disease Control (CDC) as a way to rapidly assess the health needs of a chosen sampling frame. Sampling frames are often cities or counties chosen for community health assessment or disaster relief. Master of Public Health (MPH) students at Kansas State University (KSU) partnered with the Riley County Health Department (RCHD) to adapt the CASPER toolkit for use in Riley County, Kansas. This analysis is intended to identify strengths and weaknesses in both the CASPER toolkit and the proposed Riley County CASPER protocol.

Preparation Analysis

The MPH students prepared for the CASPER trial by creating a survey using the CDC application Epi Info 7. Questions for the survey included demographics, which are intended to be included on all CASPER surveys for Riley County, and brief questions regarding the topic of COVID-19. No immediate concerns were identified as possible topics for questions due to the small scale of the trial run. This trial was not intended to produce representative data for Manhattan, Kansas. One of the possible weaknesses of this trial was the fact that guides for Epi Info are slightly out of date. Additionally, linking the Epi Info app to a database for data collection proved to be difficult due to out-of-date guides. Survey creation in Epi Info should be performed by someone who has used the Epi Info app before to ensure that the survey and database linking are performed in a manner that allows for consistent operation.

Survey creation was perceived to be simpler and easier using programs such as Qualtrics or SurveyMonkey. Due to complications with Epi Info requiring a database and manipulation of data before obtaining an Excel spreadsheet, Epi Info is considered to be a complex way to create and conduct surveys. Options such as Qualtrics, Google Forms, and SurveyMonkey allow for immediate collection of data that can be immediately imported into an Excel spreadsheet. This

trial of the proposed CASPER highlighted frustrations with Epi Info and the difficulties associated with the app.

Clusters were selected from a compiled list of US Census Bureau clusters within Riley County. While the CDC indicates that a true CASPER should randomly select 30 clusters using a random number generator, the 4 clusters selected for the trial CASPER were manually selected in order to provide clusters that had a high probability of initial responses. This deviation from CASPER protocol was intentional, and it was only done due to the fact that the small sample size was not intended to produce representative data. The randomness of a true CASPER selection would allow for a true representative sample, adding to the CASPER survey's strength.

Weaknesses found in the cluster identification and selection mostly came in the form of outdated links. The CDC has produced an official CASPER toolkit as a guide for how to run a CASPER, but the toolkit has not been updated recently. Many links to geographical information software or other resources do not direct the user to an actively updated website, while some other links in the toolkit do not work at all. To counteract this weakness, the students compiled a list of the updated links and have included the list in the official CASPER protocol.

Volunteers were primarily gathered from the KSU MPH program as well as personal contacts of the student surveyors. Riley County, especially Manhattan, has multiple excellent sources of volunteers. There are many student organizations at KSU, especially within the MPH program, that are a ready source of volunteers who may wish to learn more about the CASPER process. Additionally, there are multiple newspapers and radio stations within Riley County that may be utilized to advertise for volunteers. The CASPER trial only utilized the MPH program and personal contacts, which still provided 9 volunteers. It is recommended that future CASPERs begin volunteer signups as early as possible to ensure that enough volunteers are available.

Training Analysis

Training was conducted at the KSU College of Veterinary Medicine on January 9, 2021. The CASPER toolkit's just-in-time training allowed for volunteers to be presented with the CASPER methodology and procedures immediately before conducting their interviews in the field. This allowed volunteers to become familiar with the methods used to select and replace households without enough time passing for the information to be forgotten. The presentation

created by the CDC for CASPER training was evaluated as an asset to the training due to its simple and thorough explanation of the CASPER process. The training session took approximately 45 minutes, which allowed time for volunteers to ask questions and travel to their clusters within a reasonable time. It is extremely beneficial to emphasize the importance of proper documentation while conducting the interviews. If an electronic form is used for survey data collection, it should also be accompanied by a physical form in order to ensure no data is lost.

Additional training for any electronic data collection may be necessary during future CASPER surveys. Information and files regarding the use of Epi Info's mobile version were sent out the day prior to the CASPER trial. However, complications surrounding Epi Info caused the surveyors to be unfamiliar with all aspects of the program. If using Epi Info for future CASPER surveys, surveyors should be fully trained on the use of Epi Info. If Epi Info is not used for future CASPERs, surveyors should be fully trained on the use of the chosen data collection software. It is also recommended that the just-in-time training be accompanied by a short presentation on the chosen data collection software in order to ensure that volunteers understand the program they are using.

CASPER Conduct Analysis

Once volunteers were sent into the field, it appeared that the just-in-time training was effective in preparing them for surveying. Volunteers indicated that they felt comfortable replacing households if necessary and selecting a proper n value for random selection of households. Some struggles during the surveying portion included low response rates due to students being gone during winter break, neighborhoods discouraging soliciting, and lack of community awareness of the CASPER going on. Community awareness can be increased through an aggressive social media and promotional campaign which involves press releases, interviews with local reporters, and cooperation with local public information officers. This CASPER trial was slightly weak due to the lack of promotional materials. Due to a limited timeframe, the trial was only shared with the community through Facebook posts and word of mouth.

Most volunteer teams were required to return to their clusters on the evening of January 9th in order to re-attempt surveys to reach the target of 7 surveys per cluster. The only exception

to the return was the group responsible for Cluster 4. This group was not required to return to their cluster because they noted a high number of “no soliciting” signs and an extremely high nonresponse and refusal rate. Due to these factors, the students determined that this cluster had reached adequate survey numbers with 4 successful surveys rather than 7. This choice was made for the sake of expediting the CASPER trial and avoiding the risk of convenience or sequential sampling due to a high refusal and nonresponse rate.

The CASPER trial schedule was designed to simulate a full CASPER with multiple sessions in an attempt to reach residents at different points throughout the day or weekend. While a full CASPER would ideally take place over a three day stretch or a full weekend, the CASPER trial took place within the span of one day. The strength of a full CASPER can be seen in the fact that it may account for many different schedules. Surveying at different times of the day on different days allows for a higher probability of obtaining a more successful response rate. The CASPER trial suffered from the accelerated schedule as well as the timing of the survey. Many KSU students had not yet returned from winter break, which may have increased the nonresponse rate. Multiple clusters chosen for the CASPER trial contained apartments, which are largely rented by KSU students in Manhattan.

Volunteers indicated that the survey created for the trial could have been more inclusive when considering answer choices. Multiple volunteer groups encountered a situation where the surveyed resident refused to answer a question; however, there was not a “refused” answer option for volunteers to select. This lack of an option caused the surveyors to rely more on the paper copies of the surveys for volunteer notes, which is not feasible in a full CASPER with 210 surveys. Future surveys should include an answer for refusals as well as a thorough selection of answers that includes an “other” option. Multiple volunteer groups indicated that they received a response that was not covered by the given answer choices.

Data Analysis

Data analysis was immediately complicated by the choice to use Epi Info for the CASPER trial. The fact that the database saved recorded surveys in a file format that could not be immediately exported as a spreadsheet caused an unnecessary step in data retrieval and analysis. Technical issues with data manipulation caused further difficulties in data retrieval for analysis. It is for this reason that it is *not* recommended that future CASPERs within Riley

County use Epi Info. Survey software such as Google Forms or Qualtrics should be used due to their ability to export data into a spreadsheet without manipulation.

Once data was able to be exported to Microsoft Excel, the calculations necessary for response rates, contact rates, and cooperation rates seemed to be fairly easy. The formulae were provided by the CDC and can be found in the official CASPER toolkit on the CDC website. Due to the physical surveys being considered the gold standard for this trial CASPER, data entry was slower than expected. It was also difficult to document whether information was missing, or a resident refused to answer due to the lack of sufficient answer choices indicated by the volunteers. A major strength of the CASPER survey is that the CDC provides all necessary formulae and a guide for weighting data. It is helpful to have a team member on hand that is proficient with statistics and Microsoft Excel; however, the CASPER toolkit provides enough guidance that such a team member has plenty of guidance while performing final calculations.

Final Recommendations

We would like to make the following recommendations for future CASPERs based on our experience with the trial CASPER:

- Do not use Epi Info for survey creation and data collection. Instead, use a program such as Google Forms or a paid survey software (Qualtrics, SurveyMonkey, etc.).
- CASPERs should be preceded by weeks of public announcements, advertisements, and articles. The more time the target community has to prepare for the survey, the better.
- Future survey coordinators should utilize all possible sources of volunteers. This trial only utilized personal contacts and MPH students due to an accelerated timeframe, but other options are readily available.
- Data collection should be carried out in a way that allows for easy conversion and export into a Microsoft Excel file. The suggested programs should allow for easy data collection.
- Templates should be utilized as much as possible. These templates have been created to expedite the planning and reporting phases of a CASPER, and they may be modified as needed.
- Always ensure that there is an option for “refused to answer” on all survey questions. It may also be necessary to include an “other” option for questions with multiple options.

- Ensure that both the electronic versions and the physical versions of the surveys have fields that allow volunteers to indicate the cluster and survey numbers. In full CASPERs it will be very difficult to keep track of each individual survey.