

Adapting Community Call Centers for Crisis Support: A Model for Home-Based Care and Monitoring

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Contents

Executive Summary.....	1
Chapter 1. Final Products.....	11
1. National Planning Scenarios Analysis Matrix.....	11
2. Potential Health Call Center Capabilities for Four National Planning Scenarios...11	
3. Suggested Elements for Public Health Information and Decision Support	
Hotlines: the Health Emergency Line for the Public (HELP) Model.....	12
4. Interactive Response (IR) Applications.....	12
Chapter 2. Background.....	15
Incorporating Health Call Centers Into Community Emergency Responses.....	15
Addressing Public Concern.....	16
HEALTH.....	16
HELP.....	17
Chapter 3. Methodology.....	19
Overall Objective.....	19
Overall Strategy.....	19
Target Audiences.....	19
Challenges for Preparedness.....	20
Community Emergency Response Challenges.....	22
Planning for Public Information Needs.....	23
Chapter 4. Results.....	29
1) Establish an advisory panel of subject matter experts to supplement our expertise and provide assistance and guidance.....	29
2) Develop scenarios for mass health emergencies, including chemical, biological, radiological, nuclear, and explosive (CBRNE) events, and decide which ones provide the best opportunity for home-management/ shelter-in-place strategies.....	31
3) Research existing models, protocols, and algorithms; develop and implement a scenario-based model using poison control centers, nurse call lines, and similar centers.....	34
4) Develop a mechanism to test and evaluate the model with a local exercise.....	48
Chapter 5. Recommendations.....	57
Integration with Current Programs and Initiatives.....	59
Public Health Communications and Education.....	60
Special Needs Populations.....	61
Volunteer Use in Call Centers.....	62
Public Information Partnerships.....	63
Model Utility and Adaptability.....	63
References.....	65

Figures

Figure 1: How Do Health Call Centers Fit Into Emergency Responses?.....	15
Figure 2: Percentage of Population Reported to Have Contacted a Call Center or Hotline Related to Certain Health Events.....	16

Figure 3: Checklist for Developing Health Information Content.....	38
Figure 4: Patient Dispositions From a Clinical Care Algorithm Software Program That Many Nurse Advice Lines Would Use.....	44
Figure 5: Average Call Volume to HELP by Hour of the Day From July 22 to September 7, 2003.....	50
Figure 6: The Five Common Product Appearances for 100 mg Doxycycline Preparations.....	54

Tables

Table 1. Participating Subject Matter Experts.....	30
Table 2. Participating Federal Agency Representatives.....	31
Table 3. Mean Estimates of Influenza Impact From National Planning Scenarios.....	41

Appendixes

Appendix 1. National Planning Scenarios Analysis Matrix.....	71
Appendix 2. Potential Health Call Center Capabilities for Four National Planning Scenarios.....	73
Appendix 3. Suggested Elements for Public Health Information and Decision Support Hotlines: the Health Emergency Line for the Public (HELP) Model.....	83
Appendix 4. Developing an Interactive Response Tool: The HELP Model.....	103

Executive Summary

Objective and Directives

This report describes the development, testing, and implementation of a model to enable community health call centers, such as poison control centers, nurse advice lines, and other hotlines, to support home-management and shelter-in-place approaches in certain mass casualty or health emergency events. To guide call centers in adapting to accommodate such emergencies, we developed four specific products:

- A matrix of the Department of Homeland Security's 15 National Planning Scenarios with potential call center response capabilities specified (Appendix 1).
- For the four National Planning Scenarios for which call centers had the best capabilities, a detailed list of all the applicable capabilities (Appendix 2).
- Suggested elements for public health information and decision support hotlines. (Appendix 3).
- Four fully detailed interactive response applications that allow callers to use their touch-tone phones to automatically retrieve critical information during a public health emergency (Appendix 4).

These products were developed for the four specific planning scenarios but can be adapted to others as appropriate. Together, they cover the full range of capabilities that community health call centers can provide.

To develop these products, Denver Health responded to five specific directives. The results for each are summarized here.

Results and Recommendations

1. Establish an advisory panel of subject matter experts to supplement our expertise and provide assistance and guidance.

We convened a national advisory panel of 13 subject matter experts with backgrounds and experience in fields that we considered crucial to community and national response planning as it relates to health call centers.

In addition, we invited representatives from several key Federal agencies to participate, including the Department of Health and Human Services, Department of Homeland Security, and Department of Transportation, as well as the American Red Cross. Panelists and agency representatives convened at three advisory panel meetings and the final presentation meeting in Washington, DC. At these meetings, agency

representatives educated the panel and core team members on the current Federal response efforts under way and how this project would best integrate with or support those efforts. The core team described the potential response capabilities that community health call centers could provide in responding to specific scenarios and proposed strategies and resources for assisting them in such responses. The expert panelists provided guidance on the development of the strategies and resources and helped refine them for the greatest utility and exportability.

2. Develop scenarios for mass health emergencies including chemical, biological, radiological, nuclear, and explosive (CBRNE) events and decide which ones provide the best opportunity for home-management/shelter-in-place strategies.

We used the Department of Homeland Security's (DHS) National Planning Scenarios to ensure consistency with other preparedness and response efforts that are being developed. While these scenarios do not cover all possibilities for health emergencies, they do include a wide spectrum of disasters that communities could face. Though many other disaster scenarios have been developed, the DHS scenarios were developed with the participation of numerous Federal agencies.

We reviewed all 15 scenarios and determined which ones could benefit from use of the potential response capabilities of community health call centers. We then developed a matrix that lists each scenario, including expected casualties, infrastructure damage, evacuation/displacement of persons, sheltering, and victim care strategies. We focused development of our model on scenarios with the following characteristics:

- The community infrastructure was expected to remain intact so that call centers would be operable.
- Major public health outcomes would be involved.
- The scenario had the potential for many "worried well" (those with little or no injury who could overwhelm health care delivery systems), who could benefit from home management or sheltering in place.

We determined that four biological related scenarios (Biological Attack–Aerosol Anthrax, Biological Disease Outbreak–Pandemic Influenza, Biological Attack–Plague, and Biological Attack–Food Contamination) afforded the best opportunity to involve all potential response capabilities for community health call centers. Furthermore, our team and the panel believed that many response capabilities for biological incidents could also be used to address the response needs of chemical, radiological, and natural disasters. The broader application of health call center response capabilities to meet the needs of all 15 scenarios is discussed in this report.

3. Research existing models, protocols, and algorithms; develop and implement a scenario-based model using poison control centers, nurse call lines, and similar centers.

We researched whether there were proven or experimental models for health call center responses to the four selected scenarios or any closely related scenarios. Searches of the published literature, public health practices, and Internet resources produced only limited results related to our objective. Many local and State public health department Web sites provide flu vaccination clinic information, searchable by city name or zip code. A few health departments also had telephone information hotlines that used either standard recorded messages or live agents to provide specific clinic locations or general influenza information. We did not locate any operating examples of interactive automated telephone-based systems for providing information to or collecting information from the public during health emergencies.

We found published reports describing the use of call center capabilities for responding to health events relative to the four biological scenarios of interest:

- An influenza hotline conducted a vaccination survey during an influenza season with a vaccine shortage. The hotline addressed questions from the public regarding vaccine availability, groups most at risk, and symptoms in order to reduce inquiries to physician offices and local health departments. The authors suggested that State health departments consider a hotline to educate the public regarding influenza vaccination and to follow up with callers who were advised to receive vaccination to improve compliance.
- A health department in Canada provided SARS information to the public through a hotline and supported the management of more than 10,000 individuals placed in quarantine, mainly in their own homes. The hotline required more than 200 health department staff to support its operations over a 3-month period.
- A health department in the United States used videophones to monitor suspected SARS cases and their close contacts. Afterwards, the equipment was used to monitor patients with active and latent tuberculosis.
- Health officials in Taiwan quarantined more than 130,000 people, mostly in their homes, for 10 to 14 days to prevent the transmission of SARS. Management of those in quarantine consisted of daily visits or telephone calls to review the person's current health status, including temperature recordings and symptoms.
- Four populations (Hong Kong, Taiwan, Singapore, and the United States) were surveyed about attitudes regarding the use of preventive measures to control the spread of a contagious disease. Support for any preventative measure decreased significantly if the condition of arrest for refusing to comply was added. The most favored methods of monitoring quarantine compliance were daily visits from health officials and periodic telephone calls. In the United States, the

majority of respondents favored home quarantine for themselves and their families.

These reports suggest that using the telephone to provide information and support disease control measures such as home quarantine would likely be favorably received by the public and would assist public health agencies in the management of such efforts. Indeed, our experiences in operating a health call center that provides poison and drug information and nurse triage recommendations suggest that the public will seek out such community resources during health emergencies. We developed the Health Emergency Line for the Public (HELP) program to provide information and decision support to the public related to health events in Colorado.

In this report, we provide the HELP model blueprint so that other health call centers can consider developing these response capabilities. We also present health call-center-based information tools that use technology to better handle surges in demand, such as an Interactive Response (IR) system that allows callers to use their touch-tone phone to automatically retrieve information.

We focused the resource development on five health call center response capabilities: health information, disease/injury surveillance, triage/decision support, quarantine/isolation support, and outpatient drug information/adverse event reporting. We did not address the mental health assistance/referral capability as a specific health call center component, but included suggestions to reduce community anxiety and panic in the resources and strategies that we developed for the other five response capabilities. We assessed each response capability for: significance, applicability to scenarios, current examples, range of support technology, and staffing required. We then proposed resources and strategies for each capability.

Health Information. Use of health call centers could greatly augment mass risk communication messages and help to alleviate surges to health care systems. Our experience and that of others has shown that incidents generating public concern usually require robust mass risk communication strategies coupled with hotlines or other forums to assist those with further needs. Providing health information is applicable for all National Planning Scenarios; however, the best association of health call center expertise and community need is for: Aerosolized Anthrax, Pandemic Influenza Outbreak, Plague Outbreak, and Food Contamination.

We developed an instructional guide for community health call centers to develop a health information capability consistent with that of the HELP program (see Appendix 3, Suggested Elements for Public Health Information and Decision Support Hotlines).. We describe the components that we found to be essential for developing a standardized response capability. These components provide us with the platform onto which additional capabilities could be added to support outpatient health care and monitoring during public health emergencies. This response model for public health events includes providing consistent, accurate information, collecting and maintaining structured data to

characterize events and responses, and developing capability and capacity to adapt to other public health emergencies.

We also developed two applications for providing automated information to callers, especially important in events that could generate call volumes that surpass call center staff ability to answer calls. These two applications were developed for use with an IR system to allow callers to use their touch-tone phone to retrieve information. One IR application allows callers to get zip code-specific messages and was developed specifically for finding point-of-dispensing (POD) locations to get medications during an event requiring community prophylaxis. The Cities Readiness Initiative program of the Centers for Disease Control and Prevention (CDC) recommends POD mechanism development as a key element of readiness. The other IR application allows callers to navigate through a library of Frequently Asked Questions (FAQs) to retrieve information relative to their concern. Both applications ensure consistent and accurate information delivery: the same information is provided to every caller, every time.

Though the applications were developed for use with an IR system, they could be used without such technology. The call flows, decision trees, and message scripts could be used to guide call center staff in how to handle calls or could be used with other technology such as recordings and announcements to assist call center staff in managing higher call volumes. The POD application could be modified to provide any information based on zip codes, such as in evacuations, sheltering in place, snow cancellations, or mass vaccinations.

Disease/Injury Surveillance. Call centers that collect any health data could contribute to surveillance systems to quantify illness/injury (situational awareness) or to detect sentinel events or emerging health threats. Some health call centers may already analyze their own data to characterize their patient populations, while others may not realize the value of their data as it relates to a public health agency's need for disease and injury surveillance. The National Planning Scenario with the best association between health call center expertise and community need for disease/injury surveillance was the Pandemic Influenza Outbreak scenario, though almost all of the other scenarios could benefit from using call centers to capture health data for disease or injury surveillance.

For example, the American Association of Poison Control Centers contributes to disease surveillance by transmitting data related to toxic substance exposures to the CDC's BioSense program. That program is an initiative to develop a national biosurveillance capability that seeks to improve the Nation's capabilities for disease detection, monitoring, and real-time situational awareness through access to existing data resources.

Appendix 3, Suggested Elements for Public Health Information and Decision Support Hotlines, discusses structured data collection and public health partnering for developing disease/injury surveillance capabilities. The POD and FAQ applications, besides providing health information, also can collect data that could be useful in surveillance, such as the zip codes entered by callers seeking information.

Triage/Decision Support. Health call centers can assist with triage and decision support for health concerns and can alleviate surges to health care facilities, thereby reducing unnecessary hospital visits and associated health care costs. The National Planning Scenario with the best association between health call center expertise and community need for this capability was the Pandemic Influenza Outbreak scenario. However, almost all of the other scenarios could benefit from using call centers to assist with the triage and management of disease or injury, especially in preventing the “worried well” from overwhelming health care facilities.

Current examples of this capability include poison control centers that triage poisoning and provide exposure management support, and nurse advice lines that triage symptoms and provide symptom/disease management support. Both call center types provide such services with licensed clinical professionals on a daily basis, and this strengthens their credibility with the public. Research has shown that such centers reduce health care costs by preventing unnecessary emergency department visits and hospital admissions. Therefore, using these trusted call centers in health emergency situations should result in the same efficiencies and cost effective outcomes.

The HELP program does not use clinicians but provides disease and symptom information for the caller to use in making decisions for their own health care. Such an approach reduces the need to have clinicians—a finite resource that will be in high demand during any health emergency—on staff. For normal daily operations, trained information providers deliver scripted information and refer callers requiring exposure, symptom, or injury triage, as well as management support, to appropriate resources such as a poison center, nurse advice line, or health care provider. Using information providers to handle most public information needs prevents unnecessary calls to clinician-staffed lines so that they can continue to handle medical triage and management support calls.

Communities should consider the clinical recommendations they would use in the event of a major health emergency, such as pandemic influenza, that severely affects the health care delivery system. The health care delivery system and health care providers need to consider how they would handle a surge of sick patients in the face of increased demands on limited health care resources. A health call center needs to ensure that its recommendations are consistent with those of the rest of the health care delivery system and its health care providers.

Quarantine and Isolation Support. Health call centers are well suited to assist with monitoring or contacting those in quarantine and isolation, especially if they have appropriate guidance and resources. Research indicates public support for quarantine to control disease and for monitoring the status of those in quarantine by telephone. The two National Planning Scenarios involving infectious diseases (Pandemic Influenza Outbreak and Plague Outbreak) would potentially require the use of quarantine and isolation as disease control measures and could benefit from using call centers to support such measures. Future SARS and other infectious disease outbreaks would require planning and response capabilities similar to those for the influenza and plague scenarios.

Telephones were used to monitor those in quarantine in the SARS outbreaks in Toronto and Taiwan, and less than one percent of those in quarantine developed symptoms or were noncompliant. Simply having a staff person contacting those in quarantine can attain this response capability, but larger numbers of people in quarantine will require more automated approaches for monitoring health status and compliance. We developed a Quarantine/Isolation (QI) Monitoring Application (see Appendix 4, Developing an Interactive Response Tool) that uses an IR system and frees staff to handle only those needing further attention, such as those developing symptoms or those who did not answer earlier calls. Since most in quarantine should require only periodic monitoring, automating much of that with the QI Monitoring Application could be of great utility.

The QI Monitoring Application automatically places calls to individuals in home quarantine to assess their current health status and reports on those that don't answer so that further followup can be conducted. The application is part of an IR system that can initiate up to 12,000 calls in a ten-hour period. Though this application was developed for use with an IR system, it could be used without such technology. The call flows, decision trees, and message scripts could be used to guide call center staff in handling calls in a structured manner. The application could be adapted to other scenarios that might require contacting individuals by telephone for sheltering in place strategies. We recommend that public health agencies develop referral protocols and guidance for call center staff in handling situations in which a quarantined individual needs food, medication, or financial assistance.

Outpatient Drug Information/Adverse Event Reporting. The CDC's Cities Readiness Initiative program requires that participating cities prepare plans for mass prophylaxis with Strategic National Stockpile assets. Depending on exposure, this program could result in thousands to millions of people being dispensed antibiotic medications. Health call centers can support these efforts by providing information about the incident and the supplied medications, as well as by collecting any potential adverse event reports. The two National Planning Scenarios involving agents that would be treated with antibiotics are Aerosolized Anthrax and Plague Outbreak, but other scenarios that involve either mass vaccinations (Pandemic Influenza Outbreak), wide-scale use of medications for treating radiation exposure (Nuclear Detonation, Radiological Dispersal Devices), or Food Contamination may also require this response capability.

Examples of health call centers providing this capability include the HELP program collecting adverse event information regarding smallpox vaccinations, many drug information centers collecting information for the FDA's MedWatch reporting program, and poison control centers handling drug identification calls.

We have developed an application that would support mass prophylaxis with antibiotic drugs using an IR system. The Drug Identification (DI) Application assists callers in identifying dispensed drugs, provides information on how to take them, and describes potential adverse reactions. This would allow public health agencies to

concentrate on operating mass dispensing sites and health care providers to care for those that develop illness. Though this application was developed for use with an IR system, it could be used without such technology to guide call center staff in how to handle these calls. The application could be adapted to other scenarios that might require mass administration of medications or vaccinations and provision of relevant information.

Mental Health Assistance/Referral. Health call centers providing health information and support will help relieve anxiety and stress among the public, especially since many such centers are known and trusted resources within communities. All 15 of the National Planning Scenarios will likely result in varying degrees of community fear, panic, anxiety, and depression. Countless suicide prevention and counseling hotlines currently exist and are run by trained mental health staff. The National Suicide Prevention Lifeline provides a 24-hour toll-free service that routes callers to crisis centers across the country. Additionally, nurse advice lines are capable of handling patients with depression, and poison control centers regularly receive suicide and intentional harm calls. Health call center staff can be trained to identify callers that may benefit from a referral to community mental health resources.

4. Develop a mechanism to test and evaluate the model with a local exercise.

The HELP model has been tested over 3 years of daily operations and in response to several major health events. The HELP model has made it possible for us to provide consistent, accurate, and up-to-date information during bioterrorism exercises and public health emergencies in partnership with the Colorado Department of Public Health and Environment. The HELP program provides a model for disseminating and collecting information that, to date, has involved handling more than 75,000 calls related to several major health events, including West Nile virus (WNV) and influenza outbreaks. The public's demand for information during these events has required us to develop better strategies for delivering such services with limited staffing resources.

One strategy is to use initial announcements to relay the information most requested by callers to reduce their need to speak with staff. On average, 60 percent of callers listen to the recorded information and terminate the call, indicating that their concern was addressed with the announcement. This has remained fairly constant for a range of health events over the last 3 years. Additionally, recordings of other frequently requested information can be cycled to potentially answer callers' questions while they are waiting to speak to staff. Many callers may get the information they require from those messages and no longer need to wait for assistance. This ensures that staff is assisting those that could not be helped easily by other means. Recordings can also refer callers to other information sources, such as the Internet, that they may opt to explore instead of waiting in queue. By reviewing the concerns of callers speaking with staff, managers can determine if additional information should be added to the initial announcement or queue messages, or disseminated by the media or other sources in hopes of meeting demand without call center staff involvement.

The challenges we have encountered with surges in demand for HELP have led us to produce applications to better assist in providing information and supporting caller needs during health emergencies. Using technology such as an Interactive Response (IR) system has further improved our capacity for handling high call volumes. We have developed and tested four IR applications that we believe other community health call centers can use, as well:

- Quarantine/Isolation (QI) Monitoring
- Point of Dispensing (POD) Locations
- Drug Identification (DI)
- Frequently Asked Question (FAQ) Library

A prototype version of the QI Monitoring Application was tested in a rural user group (N=12) in conjunction with an influenza vaccination exercise in October 2005. The prototype application was revised to reflect many of the user suggestions. The revised and more fully developed QI Monitoring Application, along with the other three applications, were evaluated in an exercise in May 2006 in an urban user group (N=96) consisting primarily of local health personnel from 10 counties. The goal of the second exercise was to test the ability of the four IR applications either to initiate contact and determine health status of those in quarantine (QI Monitoring) or to effectively communicate key information to users calling into the four applications.

We met our overall exercise objectives, and we obtained excellent feedback to help us improve the tested applications. We also obtained important information on user acceptance of these IR applications. Although evaluations for all four applications were mostly favorable, it was apparent the FAQ Library application seemed more acceptable than the DI application, perhaps because the latter concerned medications that callers were asked to take.

The comments and evaluations of these applications should also help Public Information Officers in determining which ones may be acceptable for different events and in developing messaging strategies for those events. These results also suggest areas for potential community outreach efforts for public health agencies to create a more informed public. One lesson learned is that the applications will be only as good as the information that is developed for them and the means by which that information is provided to the public.

5. Prepare a final report and recommendations.

This final report describes in detail areas described above: the model, the scenarios where the model could be used effectively at various levels of response, and a comparison of the model to other existing models. A brief summary of recommendations follows.

To help the public make informed decisions and care for themselves during severe health events, such as disaster scenarios, we must plan ahead to develop strategies that will minimize or alleviate surge on health care delivery systems and accommodate those most in need. Helping community health call centers develop response capabilities through the models and applications in this report can increase their ability to support the public.

We believe, as determined, in conjunction with the advisory panel, that the four biological scenarios from the Department of Homeland Security National Planning Scenarios described above afford the best opportunity to involve most of the potential response capabilities for community health call centers.

The target audiences for the proposed scenario-specific models and applications are community health call centers that are established and trusted community resources, including:

- Poison control centers.
- Nurse advice lines.
- Drug information centers.
- Health agency hotlines.
- Local/State/Federal public health agencies.

The resources that we have developed to support outpatient health care and monitoring during health emergencies with limited staffing will allow other health call centers to meet the challenges of surges in demand related to health events. These resources will provide the public with self-service support so that persons can make appropriate informed decisions about their health concerns. The basic call center infrastructure and essential elements of the HELP program are needed to support such strategies.

The HELP Model's Interactive Response Tool and its four applications proposed in this report are not sole components but part of a comprehensive public information strategy that includes the use of mass media and community health call centers to support self-care, monitoring, appropriate referrals, situational awareness, and disease outbreak management and control.

Chapter 1. Final Products

This report describes the development, testing, and implementation of the Health Emergency Line for the Public (HELP)--a model to enable community health call centers, such as poison control centers, nurse advice lines, and other hotlines, to support home-management and shelter-in-place approaches in certain mass casualty or health emergency events.

The report presents four products, introduced here, to help community health call centers and public health and public safety agency planners adapt their call centers for surge response during a public health emergency. Following chapters provide the background, methodology, and results of the project as well as some recommendations.

1. National Planning Scenarios Analysis Matrix

We reviewed the Department of Homeland Security (DHS) National Planning Scenarios and developed a matrix that summarizes the 15 scenarios for which emergency planners should develop response capabilities. Using the same set of scenarios will allow for a common language of response planning and capabilities development, so that best practices can be shared and adapted between agencies and localities. After summarizing each scenario, the matrix shows the six response capabilities that community health call centers can provide. The National Planning Scenarios Analysis Matrix lists each scenario and indicates which health call center capabilities correspond to the expected response needs of communities.

Call centers can use the matrix to determine whether they are prepared to provide response capabilities for the scenarios most likely to occur in the communities they serve. The matrix can help frame discussions among public health and public safety agency planners so that community health call centers can be integrated into planning and responses, both as a resource and as critical infrastructure.

2. Potential Health Call Center Capabilities for Four National Planning Scenarios

We determined four National Planning Scenarios for which we determined that call centers had the best capabilities and developed a detailed list of all the applicable capabilities (Appendix 2). This document can assist call centers and public health agencies in determining the expected health needs for each scenario and selecting those for which they may want to plan.

3. Suggested Elements for Public Health Information and Decision Support Hotlines: the Health Emergency Line for the Public (HELP) Model

Appendix 3 describes many of the essential components of the HELP model. The HELP program serves as Denver Health's operational platform for disseminating and collecting consistent, accurate, and up-to-date information, in partnership with public health agencies, during bioterrorism and other public health emergencies. The goal is to provide self-service information to the public so that they can make informed decisions about their health concerns. The structure and adaptability of the HELP model have allowed Denver Health to effectively respond to major health events, such as West Nile Virus (WNV) and influenza outbreaks. Community health call centers can use Appendix 3 begin to develop similar capabilities within their existing infrastructure.

A more complete discussion of the requirements for general call center infrastructure (people, processes, and technology) can be found in the Health Emergency Assistance Line and Triage Hub (HEALTH) Model. The HEALTH model is discussed in Chapters 2 and 3, and the full report is available at www.ahrq.gov/research/health/.

We strongly urge any call center attempting to provide these community services to do so in cooperation with the appropriate public health authority. That is, the authority that, by statute, is responsible for coordinating health and medical services following a major disaster or emergency or during a developing potential medical situation. Coordination with the health authority will help ensure overall consistency with other response measures in the community.

4. Interactive Response (IR) Applications

Appendix 4 provides the blueprint for other call centers to develop similar capabilities within their own infrastructure and using their own equipment. It includes full details of the planning, analysis, design, implementation, and evaluation of the four IR applications that we developed:

- Quarantine/Isolation (QI) Monitoring (outbound application).
- Drug Identification (DI) (inbound application).
- Point of Dispensing (POD) (inbound application).
- Frequently Asked Question (FAQ) Library (inbound application).

An IR system with applications such as these allows callers to use their touch-tone phones to automatically retrieve information during a public health emergency. Since we had previously purchased an IR system, we designed the IR applications to use the available features of our equipment. We contracted with an IR consultant and developer

to oversee the development of the applications in accordance with our business requirements and specifications. The IR consultant developed the applications, provided administration and maintenance training for our internal technology staff, and assisted with modifications to the applications after testing in two exercises. Our internal technology staff made the appropriate programming changes to our telephone switch to support the IR applications. Through this process, our technology staff acquired some training on IR programming and can make certain modifications to the applications without requiring an IR consultant.

Call centers that have an IR system can contract with an IR consultant or use internal technology staff to program similar tools. Planners can review the Appendix 4 with internal technology staff to determine how best to develop the desired capabilities with available resources. Call centers that want to purchase an IR system can use the information in this appendix to help select equipment to meet their business needs and specifications. Call centers that cannot invest in such technology can still use the appendix to develop call handling procedures that their staff can use to provide the same capabilities to the public.

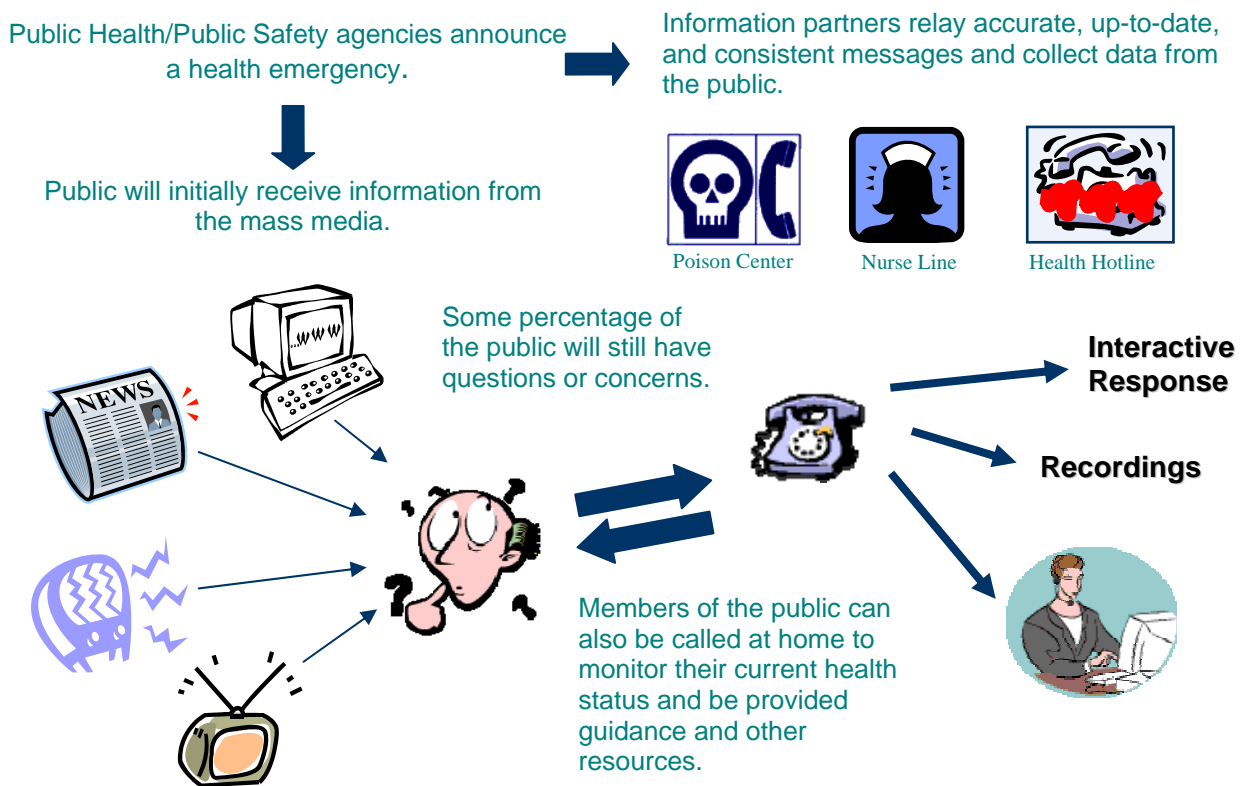
These four products were developed for the four specific planning scenarios but can be adapted to others as appropriate. Together, they cover the full range of capabilities that community health call centers can provide.

Chapter 2. Background

Incorporating Health Call Centers Into Community Emergency Responses

The overall benefit to health call center involvement in a community emergency is depicted in Figure 1. Once an event occurs, media outlets (newspapers, television, radio, Internet) will devote much time and effort to reporting on it. The public will get needed information about the event from those media sources, but there will be limited opportunities to ask questions about how those events pertain to their individual circumstances.

Figure 1. How Do Health Call Centers Fit Into Emergency Responses?

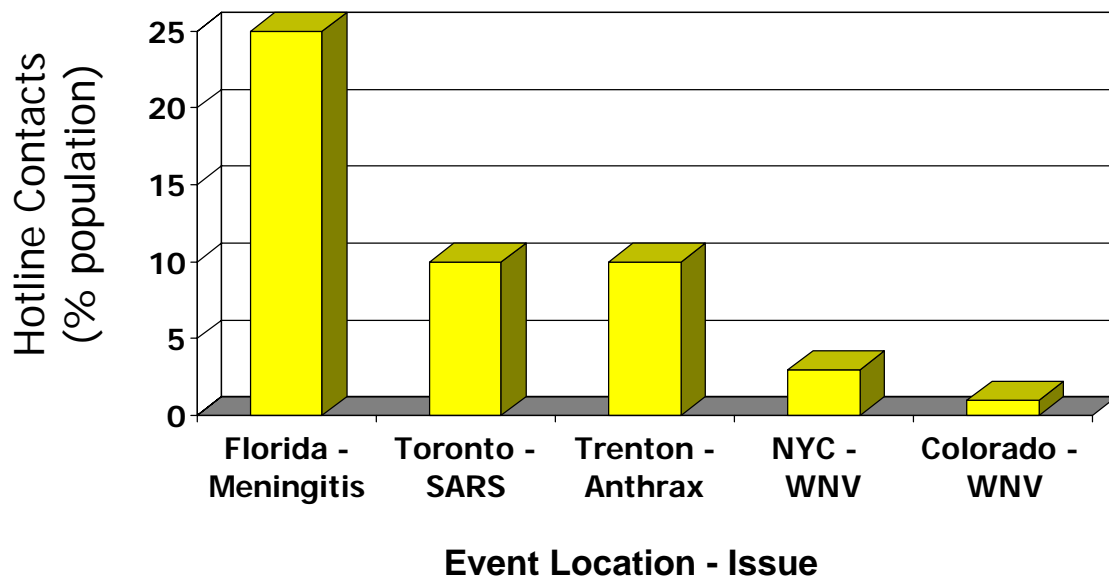


Health call centers (poison control centers, nurse advice lines, and health hotlines) have the expert and experienced staff to address the potential demand for more information with a range of approaches from recordings to speaking with a trained professional. By partnering with public safety and public health agencies, health call centers can provide information that is accurate, up-to-date, and consistent with official messages. Call centers can also collect information for use in situational awareness, from health concerns to the development of illness.

Addressing Public Concern

Public concern about an event and how it may affect individuals increases when it has potential health implications. Our previous research has shown that calls to health-related hotlines have ranged from less than 1 percent to 25 percent of the affected community's adult population, depending on the nature of the event. Figure 2 depicts that concerns for emerging insect-borne disease outbreaks in Colorado and New York City (using hotline contacts as a percentage of the population) were much lower than concerns for an infectious disease outbreak primarily involving children in Florida.¹⁻⁵

Figure 2. Percentage of Population Reported to Have Contacted a Call Center or Hotline Related to Certain Health Events



It has been demonstrated that the public perceives risk differently than public health professionals do.^{4,6} Experiences have shown that bioterrorism-related, child-focused, and newly emerging disease events, in particular, prompt people to contact call centers. Though it may be hard to predict the level of concern for any given health event, research in the field of risk communication indicates that certain risk perceptions increase levels of fear and concern. Covello et al, report that levels of concern tend to be most intense when the risk is perceived to be involuntary, inequitable, not beneficial, not under one's personal control, associated with untrustworthy individuals or organizations, and associated with dreaded adverse, irreversible outcomes.⁴

HEALTH

The Rocky Mountain Regional Health Emergency Assistance Line and Triage Hub (HEALTH) model was developed as a partial solution to the public health

communications problems that were recognized in the aftermath of September 11, 2001 and the concern about anthrax-laced letters distributed through the United States Postal Service.

The HEALTH model presents requirements, specifications, and resources needed for developing a public health emergency contact center that is highly integrated with public health agencies and that could minimize surges in the demand for health and event information during an emergency. The model was designed with medical contact centers (such as poison control centers and nurse advice lines) in mind as potential implementers, and as the appropriate repositories for the creation and maintenance of readiness for providing one-on-one health communication in a public health event.

To further assist other agencies in developing the capabilities and functions of this model, especially public health agencies, we created a HEALTH Contact Center Assessment Tool Set. The tool set is a Microsoft® Excel workbook that agencies can use to assess the potential demand they may face in a health emergency event and to determine the resources needed to address this demand. The tool set consists of seven simple checklists or spreadsheets, including:

- Instructions.
- Contact Surge Calculator.
- Staffing-Resource Calculator.
- Capital Expense Calculator.
- Technology Expense Calculator.
- Surge Options Matrix.
- Glossary.

The HEALTH model incorporates the ability to provide one-on-one health information using the latest in technology to efficiently handle this demand through various communication modalities. The Rocky Mountain Regional HEALTH model report and tools are at www.ahrq.gov/research/health.

HELP

Our poison center established the Health Emergency Line for the Public (HELP) pilot program in Colorado to provide information during bioterrorism and other public health emergencies. HELP originated as a pilot or proving ground for implementing some of the concepts and strategies that were developed in the HEALTH model. Since then, it has been continually developed and has responded to three major health events in Colorado: the deadliest WNV outbreak in the United States (2003), an influenza outbreak with early increased pediatric deaths (2003-2004), and an influenza outbreak during a vaccine shortage (2004-2005). The HELP program provides a model for disseminating and collecting information during health emergencies in partnership with a State health department.

The HELP service was offered to the public in January 2003 to support a statewide smallpox vaccination program for health care volunteers in Colorado. The vaccination program finished in March 2003. The HELP program was then modified to provide WNV information to the public in anticipation of a second season of that outbreak in Colorado. Since July 22, 2003, a toll-free line has been available 24 hours a day, featuring current recorded messages and Web site referrals for more detailed information. Trained information providers are available from 7:00 a.m. to 11:00 p.m. daily to answer questions, collect demographic data, and provide referrals. Recordings are available in English and Spanish with additional translation services available for other languages. Information providers use FAQ scripts prepared by State health epidemiologists to explain symptoms, treatments, and prevention measures to callers. Evolving public concerns are identified, and applicable responses are developed within 48 to 72 hours. The HELP program has expanded information offerings to include additional topics such as mold, influenza/pneumonia, anthrax/white powder, severe acute respiratory syndrome (SARS), hantavirus, tuberculosis, the human strain of avian influenza, and ricin. Other topics are added as information needs for the public and health providers are identified.

The HELP program provides the functional platform for piloting and testing other call center strategies, technology, and applications to efficiently provide information to the public in a health emergency. The technology infrastructure and requirements of the HELP program were described previously in the HEALTH model report. The essential elements that we have identified from the last 3 years of operating the HELP program service are addressed later in this report and in Appendix 3.

Chapter 3. Methodology

Overall Objective

Our main objectives are 1) helping the public make informed decisions and care for themselves during health events, thereby alleviating their potential demands on health care delivery systems, and 2) assisting community health call centers with developing such response capabilities by employing strategies and models to provide support in:

- Health information.
- Disease surveillance.
- Triage/decision support.
- Quarantine and isolation support/monitoring.
- Outpatient drug info/adverse event reporting.
- Mental health support/referral.

Overall Strategy

During any catastrophic event, the health care system will be overwhelmed with both the genuinely sick and the “worried well.” Communities need to use all resources available to them in order to prevent a complete breakdown in health care delivery that a large patient surge could precipitate. Community health call centers can serve a vital role in such response efforts if they are provided the appropriate tools and guidance.

The SARS outbreak in Toronto demonstrated how great public concern can be by the demand for information their hotline recorded—316,615 total calls over 3 months and a peak daily volume of 41,789 calls.² Toronto Public Health was able to effectively use recorded information and up to 46 staff at a time for handling almost two-thirds of callers. However, a third of callers were not able to speak to a staffer at the time of their call, though they indicated the need to do so. This demonstrates that, despite the best efforts of a large and well-organized public health response, including a structured hotline capability, there were still challenges in meeting the information demands of the public. This project has produced resources and strategies that can guide health call centers to provide expanded services that can assist public health and health care agencies in an emergency.

Target Audiences

Target audiences were health call centers selected based on the following criteria determined in the literature review: 1) pre-existing knowledge base/minimal

competencies, 2) existing connection to the public health network, 3) experience working within a care team framework, and 4) anticipated availability during a mass casualty event to perform the newly acquired cross-trained duties and competencies.

Health call centers identified as meeting the criteria include:

- Poison control centers.
- Nurse advice lines.
- Drug information centers.
- Health agency hotlines.
- Local/State/Federal public health agencies.

The health call centers identified would likely be familiar with basic physiological responses to particular health threats due to a pre-existing knowledge and skills gained in their area of health care. In addition, the professionals employed by such centers would likely have prior experience in assessing patient status, problem-solving, and working with symptomatic patients over the phone. During any health emergency event, they would continue to provide regular services that help direct the appropriate patients to health care facilities. In addition, they could expand services to provide information and support related to the event, much of which could be handled with nonclinical staff. In this way, they could help with surge capacity and informing the public about health issues so that they can make informed decisions and care for themselves.

Challenges for Preparedness

The 2004 Redefining Readiness Project from the Center for the Advancement of Collaborative Strategies in Health reported that approximately 60 percent of the public would not heed official instructions to get vaccinated during a smallpox outbreak, and that approximately 40 percent of the public would not heed official instructions to shelter in place during a dirty bomb incident.⁷ These statistics can be alarming to preparedness planners who assume that the public will be compliant with government recommendations. However, it is informative to understand the reasons behind such statistics.

In the case of smallpox vaccination, 55 percent of respondents indicated that they would need more advice or information. They cited lack of worry about catching the disease, serious worries about what government officials would say or do, serious worries about the vaccine, and conflicting worries about catching the disease and getting sick from the vaccine. This is consistent with the actions of health and medical professionals who chose not to get vaccinated in the CDC's Smallpox Vaccination Program, albeit without the actual presence of smallpox in the world. For those professionals, the risks of vaccination and the potential for adverse effects without a threat of the disease

contributed to their reluctance to participate in the program. However, most of these professionals would support targeted vaccinations as a strategy to stop an outbreak of smallpox—information that could help people to decide that they should get vaccinated during an outbreak.

In the case of sheltering in place during a dirty bomb incident, the major reasons for not following instructions involved concern for the safety of others (their children, family members, and pets). Having measures in place to assure the public that these others were being taken care of (school children were also sheltering in place) or were not at risk (pets kept indoors would be safe) would help them in complying with sheltering instructions.

These challenges can, in part, be alleviated by the use of community health call centers that can help provide needed information for people to make good decisions based on their individual concerns and situations. Call centers can not guarantee that everyone will comply with recommendations, but they can help people understand them and the risks or consequences of their choices.

The 2004 Redefining Readiness report further states that in regards to smallpox vaccination, “58 percent of the American people would find it extremely or very helpful if they could talk by telephone at no cost with someone they don’t know, who works for their local government, and who has been specially trained by the health department to give people information and advice about what to do in this situation. However, considerably more people (84 percent of the population) say they would find it extremely or very helpful to talk with someone they know well, who they are sure wants what is best for them, and who has been specially trained in advance to give people information and advice about what to do in this situation.” This suggests that call centers that are embedded in the community and familiar to the public should be well received when providing support during a health emergency.

Other encouraging findings come from a national survey conducted by the Harvard School of Public Health’s Project on the Public and Biological Security. Blendon et al. report that, when faced with a serious outbreak of pandemic flu, a large majority of Americans are willing to make major changes in their lives and cooperate with public health official recommendations. More than three quarters of Americans say they would cooperate if public health officials recommended that they curtail various activities of their daily lives for 1 month during a flu pandemic: 94 percent say that they would stay at home away from other people for 7 to 10 days if they were sick, and 85 percent say that they and all members of their household would stay at home for that period if another member of their household were sick. Therefore, providing support to individuals to enable them to remain at home and care for themselves could be critical.⁸

In addition, helping the public make informed decisions and to care for themselves can alleviate their demands on health care delivery systems. A community health call center can provide general topic and event information, the most current public health messages, and appropriate information on personal and family protection for almost any

emergency that has a potential health impact. They can also provide the public with specific State and local health department guidelines, points of contact for referral agencies, and general health decision support and evaluation.

It is precisely this type of support that the public requests during an emergency. In our experiences during the influenza seasons of 2003-2004 and 2004-2005 in Colorado, public concerns centered on the unique challenges of each season. For example, in 2003-2004 there were several pediatric deaths very early in the season that sparked fears in many parents. The most asked questions included “Where can my child get a flu shot?” “Where can I get a flu shot?” and “What are the symptoms of flu?” The most frequent call types during this season were information calls, followed by possible flu reports and calls from health care professionals requesting health department guidance documents. In the 2004/2005 season, there were concerns of vaccine shortage after a season that elevated influenza awareness in the public’s mind. The most asked questions this time included “Where can I get a flu shot?” “What is the status of the vaccine shortage?” and “What is FluMist?” Calls for information were the most frequent; however, calls from health care professionals requesting health department guidance documents and health departments updating our call center on current issues were the next highest. This shows that, as with community needs concerning a seasonal influenza, needs with similar health issues can change and systems need to be ready to handle those challenges.

Community Emergency Response Challenges

After September 11, 2001 and the release of anthrax letters along the East Coast over the following weeks, our call center experienced a 10 percent increase in call volume related to these events, even though the affected communities were all in the Eastern portion of the country and our call center was in the Western portion. This phenomenon concerned us, because we did not know whether further terrorist attacks were on the horizon or if anthrax letters would surface in the communities that we serve. If such events were to occur, what would be the resultant public concern, and how would that affect our call volume? Would we be able to continue to provide the regularly needed services of poisoning information consultation and nurse triage recommendations? Or would these services be hindered by the public demand for information related to the current events?

We knew that call center responses about medical concerns from the public prevented unnecessary visits to health care facilities and reduced caller panic. The public would seek this type of expertise out if they again felt threatened by exposure to anthrax in their mail or if their environment was somehow contaminated by a terrorist attack.

Poison control centers are the classic resource for parents concerned about a potentially toxic exposure to their child. These centers have trained staff who are adept at calming parents while collecting information to assess an exposure. Most of the time, these exposures are not toxic and do not require further medical evaluation. According to the 2005 annual data from the American Association of Poison Control Centers, 74 percent of calls to poison control centers are successfully managed in the home.⁹ The

availability of such resources via telephone prevents approximately 1.8 million visits annually to physician offices and hospitals. As seasonal influenza patient influxes have demonstrated, the current health care delivery system would be challenged to accommodate this number of patients.

Nurse advice lines are another important resource for those who have health concerns and who are looking for guidance on what to do about those concerns. Seventy percent of callers to the Denver Health NurseLine complied with nurse recommendations, though that same percentage of callers had a different plan for health care in mind before calling.¹⁰ The trust that callers have for nurses, the information that nurses provide, and the nurses' review of the patient's options all contribute to this substantial change of behavior.

When planning for emergency responses, it seems wise to build on the expertise, credibility, and infrastructure of community health call centers. Expanding their capabilities to inform, educate, and assist the public with their health concerns can free the health care delivery system to most effectively use limited resources to provide care to those most in need. This approach can especially aid in handling those at low risk for injury or illness, who may have valid fears and concerns that, without a mechanism to get information, could lead them to overtaxed hospitals and health departments.

To begin developing this type of response capability, there community emergency planners and their response partners should consider four questions:

- What would you do to handle a surge in public contacts during a public health emergency?
- Could you adequately predict the potential volume of contacts?
- How would you identify staff, facilities, and other resources for this need?
- If you couldn't handle this demand, who in your community could?

This report will address these issues to provide planners and response agencies with direction in answering these questions in ways that suit their communities' needs.

Planning for Public Information Needs

According to "Mass Medical Care with Scarce Resources: A Community Planning Guide," a 2007 publication by the Agency for Healthcare Research and Quality (AHRQ), the public requires clear messages and communications strategies to inform them about the status of the event and what actions they should take.¹¹ To accomplish this during an event, it is important to have all potential communication partners involved, including public information officers (PIOs) from public safety agencies, public health agencies, hospitals and health care organizations, 911 dispatch centers, special information phone lines (211, 311, health call centers), and the media.

The National Incident Management System (NIMS) guidance outlines the organizational structure for enhancing the public communication effort by formation of a

Joint Information System (JIS) to provide the public with timely and accurate incident information and unified public messages.¹² This system employs the Joint Information Center (JIC) to bring communicators such as the PIOs from various agencies together during an incident to develop, coordinate, and deliver unified messages. This helps to ensure that Federal, State, and local Governments are releasing the same information. While NIMS embraces the JIC/JIS concept, it leaves it to community planners to develop the processes, procedures, and systems for communicating timely and accurate public information during emergency situations.

Elements of a comprehensive public information strategy should include the use of:

- Mass media to provide the public with information on preventive measures, home care management, and the appropriate time to seek health care services.
- Community health call centers to reinforce mass messaging and to provide additional and more tailored information to individuals with questions and concerns, as well as to review these issues for their value as potential mass media messages.
- Community health call centers to assist with outpatient (home care) monitoring and support, thereby helping to extend the reach of public health and health care systems into households.
- Information collected by the call centers for situational awareness and disease outbreak management and control.

The CDC requires, in their Cooperative Agreement Guidance for Public Health Emergency Preparedness continuation grants for FY2006, that communities provide needed health and risk information to the public and key partners during a terrorism event or other emergencies. Target capabilities are to advise the public to be alert for clinical symptoms consistent with an attack agent, to disseminate health and safety information to the public, and to ensure that their public information line can simultaneously handle calls from at least 1 percent of the jurisdiction's population or residences.¹³

So what would that mean for a community trying to meet such target capabilities? Let's begin to address the questions that we posed above for community emergency response planners in context of the CDC target capability goal:

What would you do to handle a surge in public contacts during a public health emergency?

Many State and local health departments are beginning to develop plans and response capabilities for providing public information for pandemic influenza and other health emergencies. A recent thread on a Strategic National Stockpile Listserv indicated that public health agencies are planning a range of responses, including developing protocols and information resources, arranging for augmented staffing and volunteers, making

technology/infrastructure improvements, and partnering with established call centers. All of these are important measures and will be needed for developing any response capability. Public health or public safety agencies should reach out to health call centers in the community to learn about their capabilities and how they could assist in response efforts. Community health call centers should reach out to planners in emergency management or public health to learn about their needs and how they can be of assistance. Hopefully, the tools that we present in this report will be useful to all parties in developing the needed community response capabilities.

Could you adequately predict the potential volume of contacts and how would you identify staff, facilities, and other resources for this need?

The HEALTH Tool Set (www.ahrq.gov/research/health) can calculate call volumes given various parameters. For example, given a population of 4 million, the tool set first determines the approximate number of those most able to contact an information line (2.8 million people age 15 years or older). Given a level of public concern at 1 percent and the communication means at 100 percent phone, the tool establishes a target capability goal (based on the CDC public information hotline goal of 1 percent) of 28,000 individuals or 7,000 residences, assuming four people per residence.

Simultaneously serving that many people would require equal numbers of phone lines and staff. Such a capacity would be prohibitively expensive and impractical. Mass media messages and the Emergency Alert System would be better at addressing the most immediate concerns and needs of the public.

However, trying to accommodate that call volume over several days may be more realistic and practical, as people will naturally form questions and concerns over time as they process basic event information from media coverage and experience difficulties related to the event. Setting the event length from 1 to 5 days while keeping the call center operating for 18 hours each day (for example, from 6:00 a.m. to midnight, when most people are likely to call) estimates the staffing and phone lines required for handling the 1 percent call volume. The tool set is limited to assume that calls are equally spread over the duration of the event, but it does identify the relative numbers of staff and phone lines needed over time:

Event Duration (Days)	1	2	3	4	5
Average Calls/Day	28,000	14,000	9,333	7,000	5,600
Staffing (FTE)	354	181	123	93	76
Phone Lines	401	213	148	116	95

*These calculations assume that each caller speaks with an agent for an average call length of 293 seconds, including after-call activities.

Operating such a call center is much more than just people and phone lines. It also takes facilities, technology and management experience for it to operate well. Again, the HEALTH Tool Set can help estimate costs for capital expenses (facilities, furniture, training, etc.) and technology expenses (computers, telephones, phone switches, etc.). If

an agency is starting without much infrastructure, the costs to build a call center can be substantial. The agency may find that unless it is going to operate such services continually, investment of such funds may be impractical. The HEALTH Tool Set also has a Surge Options Matrix—a series of questions to help users decide whether to develop a call center capacity or to seek other alternatives.

If a particular agency could not handle this demand, who else in the community could?

There are usually a variety of call centers in any community that provide services such as customer relations and technical support—some may even be health related. These facilities may have the requisite capacity to handle large call volumes during an emergency, but if they are not involved in health services, they may lack staff who can handle health-related calls. It may be possible to develop partnerships with these non-health call centers for the use of their facilities during emergencies; however, staff may need to be supplied. Many other issues would need to be resolved in such arrangements:

- Under what circumstances would the facility be available? Would that access be guaranteed? Would there be any limits on how long the facility could be used for a response (days, weeks, months)?
- Would the facility have all the requisite equipment for the planned response capability? If not, could that equipment be stored onsite for when needed? If equipment is installed before an event, could the facility use it for their operations in the meantime?
- Would there be opportunities for those expected to staff the center during an emergency to practice call handling before an event? Would they have access to that facility for such practice? Could there be periodic exercises to test the ability to mobilize resources and staff the facility?
- Would the facility's employees (since they are familiar with call center operations) be a potential staffing pool for a response? If so, could they be trained beforehand in how to handle health related calls? Would they be paid to participate in the response or would they be volunteers? What are the liability issues for using facility staff in either circumstance?
- Are there any costs for facility "readiness" for a response? What would the costs be for using a facility during an event (direct cost reimbursement or daily usage fee)? For a prolonged response, would there be economic impacts to the facility's business operations, and who would be responsible for those impacts?

This is just a partial list of issues that would have to be resolved. Many of these issues may not be a factor for those considering using community health call centers for providing response capabilities during an event. These call centers can include poison control centers, nurse advice lines, drug information centers, and public health hotlines,

among others. Since these community call centers deal with health-related calls every day, it should be easier for them to provide the needed capabilities under contract or in partnership with public health and public safety agencies.

It is likely that established health call centers would need additional resources only in equipment and staffing to provide services that are similar to those that they provide daily. In addition, these call centers have established relationships with the community that could help gain public trust in information from such sources. It is generally easier to expand the breadth of services that a trusted health call center provides normally than to convert a non-health call center to provide services that it normally does not.

The objective of this project is to provide some guidance, strategies, and resources for both community health call centers and the agencies planning for emergency event responses so that each understands how they can successfully develop the capabilities needed to meet the expected public needs for information and support.

Chapter 4. Results

AHRQ assigned us five primary tasks to develop this model for adapting community health call centers to support outpatient health care and monitoring in a major health care crisis. We anticipate that this model will integrate with other community efforts by a variety of response agencies to address the specific needs of the public in certain health emergency scenarios. The goal of this project is to provide community health call centers with a tested model for responding to a health emergency and the resources to help inform and support the public.

1) Establish an advisory panel of subject matter experts to supplement our expertise and provide assistance and guidance.

We convened a national advisory panel of 13 subject matter experts (Table 1) that met at three advisory panel meetings held in Washington, DC. Panelists had backgrounds and experience in:

- Public health and epidemiology.
- Emergency preparedness planning, responses, and exercises.
- Emergency call center services.
- Nurse advice/triage and health decision algorithms.
- Poison control centers and medical toxicology.
- Health informatics.
- Data and voice technology.
- Victim services and mental health counseling.
- Risk communication.
- Law and public policy.

Table 1. Participating Subject Matter Experts

Subject Matter Expert	Agency
David Pote, RS, REM	San Luis Valley, CO
Stephen P. Teret, JD, MPH	The Johns Hopkins University Bloomberg School of Public Health
Jane Shunney, RN	Clark County Health District, NV
Alicia Cronquist, RN, MPH	Colorado Department of Public Health and Environment
Diane J. Skiba, PhD, FAAN, FACMI	University of Colorado Health Sciences Center
Tracy Volkman, REHS	Denver Public Health
Robin Fudge Finegan, MA, MNM	Finegan Flannigan and Associates
Rocco Casagrande, PhD	Gryphon Scientific, LLC
Les Mortensen	LVM Systems
Thomas Glimp, MD, FAAEM	Medcor, Inc.
Rick Jones, ENP	National Emergency Number Association
Edward P Krenzelok, PharmD, FAACT, DABAT	Pittsburgh Poison Center, Children's Hospital of Pittsburgh
Donald M. Vickery, MD	Demand Management Consultant

The panelists represented agencies and fields that were considered crucial to community and national response planning as it relates to community health call centers. They helped in reviewing our objectives, selecting appropriate disaster scenarios, and reviewing concepts for model and application development. Once application prototypes were developed, the panel reviewed exercise results and provided suggestions for improvement and exportability.

In addition, we invited representatives from several key Federal agencies and the American Red Cross to participate in panel meetings and the final presentation (Table 2). These representatives educated the panel and core team members about other Federal response efforts underway and how this project would best be able to integrate or support those projects. Agency representatives are listed in the table below.

Table 2. Participating Federal Agency Representatives

Representative	Agency
Sally Phillips, RN, PhD	AHRQ Public Health Emergency Preparedness Research Program
Tom Sizemore, MD	Department of Health and Human Services (HHS) Office of Preparedness and Emergency Operations
Ann Knebel, RN, DNSc, FAAN	HHS–Office of Preparedness and Emergency Operations
Ann E. Norwood, MD	HHS Office of the Secretary
Daniel Dodgen, PhD	Substance Abuse and Mental Health Services Emergency Coordination
Richard Hatchett, MD	National Institute of Allergy and Infectious Diseases
Suzi Gates, MPH	Centers for Disease Control and Prevention (CDC) Office of Communications
Carol Simon, BSN, PharmD	CDC Coordinating Office for Terrorism Preparedness & Emergency Response
Charles Magruder, MD, MPH	CDC Information and Knowledge System Branch
Dale Nordenberg, MD	CDC National Center for Infectious Diseases
Ellen Morrison	Food and Drug Administration Office of Crisis Management
Carol Hollis	American Red Cross Emergency Coordination
Dee Yeater	American Red Cross Health Services
Rick Davis	American Red Cross Emergency Communications
Dennis Atwood	Department of Homeland Security Metropolitan Medical Response System

2) Develop scenarios for mass health emergencies, including chemical, biological, radiological, nuclear, and explosive (CBRNE) events, and decide which ones provide the best opportunity for home-management/shelter-in-place strategies.

We used the Department of Homeland Security’s National Planning Scenarios to assure consistency with other preparedness and response efforts.¹⁴ These 15 scenarios do not cover all possibilities for health emergencies; however, they do include a wide spectrum of disasters that communities could face. Although other potential disaster scenarios have been used for response planning, these 15 have been developed in a very structured manner and with participation of numerous Federal agencies. Using these scenarios will provide a common framework for sharing best practices and strategies.

We reviewed all 15 scenarios and determined the ones that could best benefit from the potential response capabilities of community health call centers. The six response capabilities that were assessed include:

- Health information.
- Disease surveillance.
- Triage/decision support.
- Quarantine/isolation support.
- Outpatient drug information/adverse event reporting.
- Mental health assistance/referral.

We developed a matrix that lists each scenario and the expected casualties, infrastructure damage, and evacuations/displaced persons as presented in the executive summary for that scenario (see Appendix 1). We also provided the recommendations for evacuations, sheltering, and victim care strategies from the activated mission areas listed in the document. We determined which of the six potential response capabilities would be appropriate or practical for community health call centers to provide in each scenario. Each capability was then graded based on our experiences and the anticipated response needs of a community during such a disaster scenario using the following scale:

- Capabilities that correspond best with expertise of health call centers and the expected response needs of a community.
- Other capabilities that correspond with the expertise of health call centers and the expected response needs of a community.
- Capabilities that may exist in health call centers though there may not be the response need in a community.
- Capabilities that health call centers would need to refer to more appropriate resources within a community.
- Capabilities that are not well-suited to community needs for this scenario.
- Primarily a community response capability with which health call centers would need to integrate.

The scenario matrix indicates that a health call center's capability to provide health information most frequently corresponds with the expected response needs of a community. The strongest association for this call center capability and community need occurs with the biological scenarios. However, providing health information would also be of benefit in almost all scenarios: nuclear, radiological, chemical, and natural disasters. For the remaining five call center response capabilities, the strongest associations with perceived community needs seem to correspond best with the

biological scenarios. Conversely, a technologically centered cyber attack seems the “weakest” scenario for benefiting from most of the response capabilities of a health call center.

Therefore, we decided to focus our model development on the biological scenarios since they involve large health impacts, have the potential for many “worried well,” and could benefit from home management of illness and sheltering in place strategies, and because community infrastructure could be expected to remain intact so that call centers would likely be able to operate. We determined, in conjunction with the advisory panel, that four of the biological scenarios afford the best opportunity to involve most of the potential response capabilities for community health call centers:

- Biological attack – aerosol anthrax.
- Biological disease outbreak – pandemic influenza.
- Biological attack – plague.
- Biological attack – food contamination.

In addition, we developed potential health call center capabilities for each of the four selected National Planning Scenarios (Appendix 2), which provide specific suggestions for each of the six health call center response capabilities. This document can assist call centers and public health agencies in determining the expected health needs for each scenario and selecting those for which they may want to plan.

This is not to imply that health call centers could not play an important role in responses to other scenarios, but rather that developing tools related to the response needs of these biological scenarios afforded the greatest potential for success. As the scenario matrix suggests, the resultant applications and response strategies could then be assessed for applicability or modification to address the response needs of other scenarios. For example, a surveillance application for influenza or plague reports could be adjusted to capture chemical or radiological agent illness reports.

Our assessment also suggested that, while mental health assistance and referral is a capability that all scenarios would likely need, it is primarily a community response capability in which health call centers would play a supportive role. Therefore, we did not specifically develop an application for this capability but instead considered how to incorporate sensitivity to community emotions, stress, and anxiety that a major disaster will exacerbate.

3) Research existing models, protocols, and algorithms; develop and implement a scenario-based model using poison control centers, nurse call lines, and similar centers.

To better develop our community health call center model and tools, we first researched available information on existing models, protocols, and algorithms for community communication strategies related to the four biological scenarios.

In the fall of 2005, we searched www.PubMed.gov (medical and scientific literature), www.Google.com (Internet), and www.CDC.gov (public health practice and guidance) Web sites to locate information. We used subject keywords (biological attack, disease outbreak, anthrax, aerosol anthrax, inhalation anthrax, plague, pneumonic plague, influenza, pandemic influenza, food contamination) in combination with each of these focusing keywords (surveillance, triage, quarantine, isolation, mental health, prophylaxis, side effects, adverse events, clinical algorithms). Results from these searches were reviewed to find existing models of call center strategies for community communication and support.

The searches revealed only limited results related to model development. We did, for example, identify many city and State public health department Web sites providing influenza vaccination clinic information that were searchable by using either city name or zip code (California¹⁵, Minnesota¹⁶, Georgia¹⁷, Massachusetts¹⁸). A few included a telephone information hotline as well (San Diego¹⁹, Oregon²⁰). We did not locate any States using interactive automated telephone-based systems, but some did have either noninteractive recorded messages or a person on the line providing specific clinic location or general influenza information. Some Web sites simply forwarded the user to the CDC Web site for general influenza information.

A report by Cartter et al. described the Connecticut influenza hotline and how it conducted a vaccination survey during the 2004-2005 influenza season when there was a vaccine shortage. The hotline addressed questions from the public regarding vaccine availability, which groups were most at risk, and influenza symptoms in order to reduce inquiries to physicians and local health departments. The authors suggested that State health departments consider a hotline to educate the public regarding influenza vaccination and to follow up with callers who were advised to receive vaccination in order to improve compliance.²¹

A few reports were related to severe acute respiratory syndrome (SARS) surveillance strategies using telephones or call centers:

- Toronto Public Health, in addition to providing SARS information to the public through their hotline, also used this resource to support the management of 13,291 individuals who were placed in quarantine, mainly in their own homes. Of that

number only 0.1 percent were issued an enforceable quarantine order after initial noncompliance.²

- Kuhles reported using videophones to monitor seven suspected SARS cases and their close contacts. Afterwards, the videophones were used to monitor patients with active and latent tuberculosis. The videophones enabled local health department staff to visually assess the patient's condition during each call.²²
- Lee et al. reported on the experience in Taiwan of using quarantine to prevent transmission of SARS. From late February to mid June 2003, more than 131,000 people were placed in quarantine for 10 to 14 days; most were placed in home quarantine during the months of April and May. Management of those in quarantine consisted of daily visits or telephone calls to review the person's health status including temperature recordings and symptoms. The quarantine was considered very successful with only 0.2 percent fined for violation of quarantine rules.²³
- Blendon et al. reported results of a survey conducted in four populations (Hong Kong, Taiwan, Singapore, and the United States) concerning attitudes about quarantine in a public health emergency. Respondents were asked if they supported the use of three preventive measures to control the spread of a contagious disease: requiring everyone to wear a mask in public, requiring everyone to have their temperature taken to screen for illness before entering public places, and quarantining people suspected of having been exposed to the disease. The percentage of people favoring any measures in any population ranged from 44 percent to 99 percent; the highest mean favorable response occurred for quarantine. However, support for all measures decreased significantly if the condition of arrest for refusing to comply was added. Respondents were also asked about their preferences for monitoring compliance during quarantine and were most in favor of a daily visit from a health official followed by periodic telephone calls. The least favored methods of monitoring were more intrusive measures such as periodic video screening, electronic bracelets, and stationed guards. In the U.S., more than 70 percent of respondents favored home quarantine for themselves and their family as opposed to a separate facility.²⁴

These results suggested to us that using the telephone to provide information and support disease control measures like home quarantine would likely be favorably received by the public and would assist public health agencies in the management of such efforts. We therefore proceeded with the use of the HELP model as a platform for a wide range of call center based health information strategies on which we could explore the use of an Interactive Response (IR) system to automate certain of those functions to better handle surges.

We developed tools for the five response capabilities mentioned earlier:

- Health information.
- Disease/injury surveillance.
- Triage/decision support.
- Quarantine/isolation support.
- Outpatient drug information/adverse event reporting.

This section will review each response capability and propose scenario-based strategies for using community health call centers, including:

- Significance of the response capability.
- Applicability of the capability to the National Planning Scenarios.
- Current examples of the capability.
- Range of technology to support the capability.
- Staffing required to deliver the capability.
- Our proposed resources and strategies for the capability.

Health Information

Significance. Use of health call centers could greatly augment mass risk communication messages and help alleviate surges to health care systems. Our experience and that of others has shown that incidents that generate public concern usually require robust mass risk communication coupled with hotlines or other forums to assist those with further needs.⁵

Scenarios. Of the 15 National Planning Scenarios, we identified applicability for this health information capability in all scenarios, with the best association of health call center expertise and community need for Aerosolized Anthrax, Pandemic Influenza Outbreak, Plague Outbreak, and Food Contamination.

Current Examples. Current examples of health information capabilities include those provided by poison control centers, nurse advice lines, drug information centers, many public health agency hotlines (often single issue focused or developed ad hoc to address a certain event), and our HELP program.

Technology. Basic telephone technology is required to provide health information capability and could consist of a single phone line with a recording or a live agent. Accommodating larger call volumes requires additional phone lines, a telephone switch that can support simultaneous announcements, automated call distribution, call management software, and even additional equipment, such as an IR system to allow callers to retrieve information by voice or by touch-tone entries. The HEALTH model report describes much of the technology that an advanced call center that expects to handle significant call volume should consider.⁵

Staffing. Delivering health information requires trained information providers—individuals who have been trained in customer service, operating telephones and other equipment, and the topical content. Clinicians are not required (and would be overqualified) for this capability unless a call center is being considered for providing assessment or management of a caller’s health concern or medical condition.

Proposed Resources. Appendix 3, Suggested Elements for Public Health Information and Decision Support Hotlines, offers instructions that a community health call center can use to develop health information capabilities that are similar to the HELP program. The model describes the essential components for developing a standardized response capability and provided us with the platform onto which additional capabilities could be added to support outpatient health care and monitoring during public health emergencies. This model for responding to public health events includes providing consistent and accurate information, collecting and maintaining structured data to characterize events and responses, and developing capability and capacity to adapt to other public health emergencies. Issues that are important to the creation of standardized responses are call-handling procedures, call center infrastructure/technology issues, creation of toll-free lines with up-to-date recordings, integration of related Web sites, training for information providers, defining referral procedures, quality control and quality assurance practices for maintaining consistent and accurate information delivery and reporting protocols.

We strongly urge a call center attempting to provide health information during an emergency to do so in cooperation with the public health authority that is, by statute, responsible for coordinating health and medical services in response to public health and medical care needs following a major disaster or emergency. Coordination with the health authority will help ensure overall consistency with other response measures. Figure 3 shows the process that we used to draft, review, and approve health information content. The messages on various health topics in some of the applications in this report were developed in concert with State health department epidemiologists. They should not be viewed as absolutes, and any call center planning to use the message contents should first have them reviewed by its own public health agency.

Figure 3: Checklist for Developing Health Information Content

- 1) Develop message or FAQ content.
 - ✓ Determine topic.
 - ✓ Determine question(s) to be addressed.
 - ✓ Review available information.
 - ✓ CDC Web site and printed materials.
 - ✓ State/local health department Web sites and printed materials.
 - ✓ Internet search engine (i.e. Google, Yahoo).
 - ✓ Prepare draft questions and answers (keep wording at 3rd grade level and under).
 - ✓ Submit drafts to State/local epidemiologists responsible for approval.
 - ✓ Once approved, add information content as appropriate.
 - ✓ FAQ: enter into searchable format with keywords, and load into system used to manage information resources.
 - ✓ Message: record message and incorporate into call flow(s) where appropriate.
 - ✓ Determine if need to translate content into other languages.
- 2) Train staff on content, and monitor for consistent use.
 - ✓ Use quality assurance/quality control methods to assure consistency among staff (case review, listening in, role playing).

We have developed two applications for providing automated information to callers, which is especially important in events that could generate increased call volumes that surpass a call center's staffing capacity. The two applications were developed for use with an IR system so that callers can retrieve information using a touch-tone phone. Both ensure consistent and accurate information delivery: the same information is provided to every caller, every time. These applications are summarized below and described fully in Appendix 4, Developing an Interactive Response Tool.

POD Application. The CDC's Cities Readiness Initiative program (www.bt.cdc.gov/cri/) recommends Points of Dispensing as a key element of readiness and response. This IR application will provide inbound callers with locations for drug dispensing sites in their county based on the caller's zip code. The caller can choose between English and Spanish. The application also can provide an individual message for each zip code within a county to allow for relaying customized information. Finally, the application can report on how many callers select each message option.

FAQ Library Application. The FAQ Library Application can disseminate health department-approved, up-to-date, consistent, and accurate information to the public and health care providers. This IR application allows callers to navigate through a library of FAQs to retrieve information relative to their concern. Callers can choose to speak to an information provider. The information providers use the same FAQs to answer caller questions. The application provides reports on how many callers selected each message option and on the zip codes entered. An initial bulletin announcement can be activated to

provide emergency or seasonal information prior to callers being prompted for their zip code.

Although these applications were both developed for use with an IR system, they could be used without such technology. The call flows, decision trees, and message scripts could be used without technology to guide call center staff in how to handle calls and what information to provide. Or these applications could be used with other technology such as recordings and announcements to assist call center staff in managing higher call volumes. Both applications could be adapted to other scenarios than those for which they were originally designed. The POD application could be modified to provide any information to be delivered based on a zip code designation for such events as evacuations, sheltering in place, snow cancellations, or mass vaccinations. The FAQ application could have any topics loaded into it for callers to retrieve.

Disease/Injury Surveillance

Significance. Call centers that collect any health data could contribute to surveillance systems for reporting illness/injury (situational awareness), for detection of sentinel events, or for emerging health threats. Some health call centers may already analyze their own data to characterize their patient populations or to identify health issues as they emerge. Others may not realize the value of their data as it relates to a public health agency's need for disease and injury surveillance.

Scenarios. Of the 15 National Planning Scenarios, the one with the best association between health call center expertise and community need for this capability was Pandemic Influenza Outbreak, though almost all the other scenarios could benefit from using call centers to capture health data related to disease or injury surveillance.

Current Examples. A current example of a health call center contributing to disease surveillance is the HELP program and its experiences in identifying sentinel events such as hantavirus and tuberculosis cases, as well as supplying weekly geo-coded data on self-reported cases of influenza/pneumonia, mold exposures, and WNV-related dead bird reports. The American Association of Poison Control Centers also transmits data related to toxic substance exposures to the CDC's BioSense program (www.cdc.gov/biosense/files/BioSense_Overview_Handout9-06.pdf), whose objective is to improve the Nation's capabilities for disease detection, monitoring, and real-time situational awareness through access to existing data from health care organizations across the country. Some individual poison centers²⁵ and nurse advice lines²⁶ have also analyzed their data as part of syndromic surveillance programs. Drug information centers that collect information on adverse drug events related to medical products contribute data to FDA's MedWatch reporting program (www.fda.gov/medwatch/).

Technology. Besides the call center technology mentioned previously for providing health information capability, a data collection system would be required for a disease and injury surveillance capability. Such data collection systems could range from forms or databases in software applications such as Microsoft Excel and Access that are

designed to capture specific data to more advanced data collection applications that are marketed to health call centers for managing their operations. Statistical analysis capabilities would require the use of commercial software applications such as Microsoft Excel, SAS, or SPSS. Call centers could perform analysis themselves, or they could provide the data to public health or other agencies for analysis.

Staffing. In addition to information providers who are trained to collect data, statisticians and/or data analysts would be needed to perform and interpret analyses.

Proposed Resources. Appendix 3, Suggested Elements for Public Health Information and Decision Support Hotlines, discusses structured data collection and public health partnering for developing disease surveillance capabilities. The POD and FAQ library IR applications described above that provide health information also can collect zip code data that could be useful in surveillance, such as which zip codes are entered for callers seeking information related to WNV in humans or for callers seeking antibiotic medication dispensing locations.

Triage/Decision Support

Significance. Health call centers can assist with triage and decision support for health concerns. These support services can alleviate surges to health care facilities and thereby reduce associated health care costs that occur with hospital visits.

Scenarios. Of the 15 National Planning Scenarios, the Pandemic Influenza Outbreak had the best association between health call center expertise and community need. However, almost all the other scenarios could benefit from using call centers to assist with the triage and management of disease or injury, especially in preventing the “worried well” from overwhelming health care facilities.

Current Examples. Current examples of call center capabilities with triage and decision support include poison control centers that triage poisoning and provide exposure management support and nurse advice lines that triage symptoms and provide symptom/disease management support. The fact that these call center types provide services by licensed professionals (nurses, pharmacists, physicians) lends public credibility to the capabilities. Research has shown that a nurse advice line can affect patient behavior and facilitate the most appropriate use of health care resources.¹⁰ Poison control centers save an estimated \$6.50 for every dollar invested in their operation.²⁷ By preventing unnecessary emergency department visits and hospital admissions through poisoning management support and consultations, they reduce use of expensive diagnostic testing, inappropriate use of antidotes, and lengthy hospital admissions. Therefore, using these same call centers in health emergency situations should result in the same efficiencies and cost effectiveness outcomes.

The HELP program does not normally provide symptom, disease, or exposure management and, therefore, does not need to be staffed by clinicians. It does, however, provide disease and symptom information that supports the public in making informed

decisions about their health care. For normal daily operations, HELP is staffed with trained information providers who deliver scripted information and refer callers requiring exposure, symptom, or injury triage, as well as management support, to appropriate resources such as a poison center, nurse advice line, or a health care provider. Another value of the HELP program providing health information to the public in an emergency event is preventing unnecessary calls to clinician-staffed lines and allowing them to appropriately handle medical triage and management support calls. However, the HELP program could be staffed with clinicians to provide triage or symptom management support for an emergency event, if needed. An example of this occurred when clinicians were needed to support a statewide smallpox vaccination program.²⁸

Technology. In addition to the call center technology and the data collection systems mentioned previously, clinicians require proven and stable software programs. These programs should be secure and HIPPA-compliant, and they should include embedded triage and decision support algorithms; support for the necessary health, medical, and drug information; and appropriate documentation and storage of collected data, recommendations, and information. For information providers solely providing information that supports the caller in making an informed decision about their health concerns, the same call documentation is appropriate and beneficial. Call recording is essential, as it ensures quality assurance and quality control, supports staff training, and serves as a durable record of call content.

Staffing. Depending on the service provided, trained information providers and/or clinicians such as nurses, pharmacists, physicians, nurse practitioners, or physician assistants may be needed to staff the call center.

Proposed Resources. We are not proposing a specific resource beyond the delivery of health information by information providers to allow callers to make the most appropriate decision for their health concerns. However, we are suggesting that communities consider the clinical recommendations they would use in the event of a major health emergency that severely impacts the health care delivery system, such as pandemic influenza (Table 3).

Table 3. Mean Estimates of Influenza Impact From National Planning Scenarios¹⁵

Health Outcomes	15% GRA*	35% GRA*
Fatalities	87,000	207,000
Hospitalizations	314,400	733,800
Outpatients Visit	18.1 million	42.2 million
Self-care Ill	21.3 million	49.7 million

*GRA = gross rate of attack; the percentage of US population with a clinical case of influenza.

A community may need to adjust standards of care in its planning for handling the increased patient demands from a pandemic or severe influenza outbreak. For more

information, review the AHRQ publication, *Mass Medical Care with Scarce Resources: A Community Planning Guide* (<http://www.ahrq.gov/research/mce/>). Health care delivery systems and health care providers need to consider how they would handle increased volumes of sick patients, many of whom will not necessarily benefit from direct evaluations, in the face of increased demands on limited health care resources. A health call center would need to ensure that its recommendations to callers were consistent with those of the rest of the health care delivery system and its health care providers. The following example includes some information that a call center may consider using as part of a home care management strategy.

Information for Patients. The language presented here is meant to be a discussion starter for communities to begin planning for handling the increased patient demands that could result from a pandemic or severe influenza outbreak. This language is not meant to be used as presented but rather, should be used by health care providers to strategize how they would handle increased volumes of sick patients, many of whom will not necessarily benefit from direct evaluations in the face of increased demands on limited health care resources. As part of such a strategy, clinical care algorithm dispositions may need to be reviewed and potentially revised.

- Influenza is a viral illness that causes muscle aches and pains, as well as respiratory symptoms ranging from cough, fever, and sore throat to severe respiratory distress.
- Almost everyone has experienced influenza at some point in their lives; it is most likely to occur in the winter when viruses are more easily spread from person to person.
- The human strain of avian influenza is expected to result in more people having severe respiratory symptoms than is usual for other types of influenza.
- Just as with other types of influenza, there is not any specific treatment available.
- In most cases, rest, fluids, and over-the-counter medications that help to lessen your symptoms are all that is needed.

“You have indicated that you have some of the symptoms of influenza but are not experiencing the most severe symptom, respiratory distress or breathing difficulty. That is very good. It is likely that your symptoms will not worsen, and home care will be all that is required. Because there is no specific treatment for influenza, medical care is only a benefit for those who are in severe respiratory distress and require assistance in breathing. Therefore, unless you are having substantial difficulty in breathing, there will be no benefit in going to the hospital or the doctor’s office. Another advantage of staying home is that you avoid the spread of influenza that occurs in these settings. You could be exposed to influenza or, if you have influenza, you may expose others to the disease.”

Home health care measures should include:

- Rest. (Help your body's immune system to fight off the flu by getting lots of rest.)
- Fluids. (Drink plenty of fluids to keep hydrated.)
- Over-the-counter medicine. (Pain relievers, decongestants, and fever reducers can help lessen many influenza symptoms and give you some relief.)
- Temperature. (Monitor your temperature periodically.)
- Food. (Your body needs food to replenish the energy used to fight off influenza.)

Monitor yourself. (If any of these symptoms occur, contact us or seek medical care):

- Shortness of breath or difficulty breathing.
- Confusion or seizures.
- Inability to retain fluids and keep hydrated.

If your health status changes, you can always call us back to be re-evaluated and get further recommendations.

As an example, Figure 4 below contains a listing of possible patient dispositions that clinical care algorithm software programs can recommend when used by nurse advice lines. Many of these recommendations are conservative and tend to refer patients to health care providers for in-person clinical evaluation. This conservative approach helps to assure that potentially significant medical conditions receive the appropriate diagnostic testing and clinical followup. However, in a severe health emergency such as pandemic influenza, community health care resources could be overwhelmed and require more judicious use of limited health care resources. In such a scenario, alternative dispositions and recommendations may be needed, especially those supporting home care management, if appropriate, to help alleviate demands on the health care delivery system. Another consideration is directing patients with non-influenza signs and symptoms to specific facilities to reduce the potential for disease spread among patients.

Figure 4: Patient Dispositions From a Clinical Care Algorithm Software Program That Many Nurse Advice Lines Would Use

Nurse Advice Line Recommendation	Pandemic Event Recommendation
<ul style="list-style-type: none"> -Homecare -Provide home/self care -Instructed in self care -Information or advice only -Homecare with follow up PRN -Homecare with appt in 2 weeks -Call HCP within 24 hours -Call or see HCP within 2 weeks -Call or see HCP within 24 hours -Call or see HCP within 3 days -See HCP within 72 hrs -See HCP within 24 hrs 	<p>Consider revising these dispositions as part of community pandemic influenza response measures; explore alternatives such as increasing homecare guidance to reduce referrals to other HCPs.</p>
<ul style="list-style-type: none"> -See HCP within 4 hrs -Care required within 4 hrs Activate EMS 911 -See in ED immediately 	<p>These dispositions require more immediate action and should continue to be directed to appropriate HCPs; consider specific locations to direct these patients to.</p>

*PRN= according to need (from the Latin "pro re nata"); HCP=health care provider; EMS=emergency medical system; ED=emergency department.

Quarantine/Isolation Support

Significance. Health call centers can assist with monitoring and supporting patients in quarantine and isolation. Several reports are published of managing and monitoring by telephone those placed in quarantine for SARS.^{2,21-23} Other research has indicated public support of the use of quarantine to control disease and for monitoring the status of those in quarantine by telephone.²⁴ The Seattle/King County Advanced Practice Center offers a toolkit for “Planning & Managing for Isolation & Quarantine” (www.isolationandquarantine.com) to assist in proactively planning for and managing the implementation of large-scale isolation and quarantine. They suggest establishing a public health hotline and call center for public inquiries and caution:

“In an emergency situation, focus on your expertise. Do not try to reinvent yourself or your organization by taking on something outside of what you know. Admit where your expertise ends and find the community organizations with whom you can partner to acquire their expertise for the response.”

Community partners such as health call centers are well suited to assist with monitoring or contacting those in quarantine and isolation, especially if they had appropriate guidance and resources.

Scenarios. Of the 15 National Planning Scenarios, only the two scenarios involving infectious diseases, Pandemic Influenza Outbreak and Plague Outbreak, would potentially require the use of quarantine and isolation as disease control measures and could benefit from using call centers. Though SARS outbreak is not one of the DHS scenarios, SARs and other infectious diseases would require planning and response capabilities similar to those for influenza and plague scenarios.

Current Examples. Telephones were used to monitor those in quarantine in the 2003 SARS outbreaks in Toronto² and Taiwan.²³ Public health departments around the country currently use quarantine and isolation measures with tuberculosis patients, and in Nassau, NY, they use videophones to monitor patient status and compliance.²² The CDC Division of Global Migration and Quarantine also has field stations at certain airports when suspected infectious persons are identified on airplanes inbound to the United States.²⁹

Technology. Basic telephone technology is required to initiate periodic calls to those assigned to home quarantine by public health agencies. Simply having a staff person place calls on a single phone line can attain this response capability. As larger numbers of people are placed in quarantine, additional personnel and phone lines are needed to manage them. As the number of those in quarantine reaches into the thousands (as in the Toronto and Taiwan experiences), an IR system would be beneficial in automating those periodic calls, recording those who answered and their reported health status, transferring people who needed further attention to staff, and reporting those that did not answer within the specified attempts for followup.

Staffing. Trained information providers could manage quarantine monitoring and provide assistance and referrals according to established public health agency protocols. Agencies like the American Red Cross could be used to help support those in quarantine by delivering food or other supplies.

Proposed Resource. We have developed the Quarantine/Isolation Monitoring Application to support quarantine and isolation monitoring strategies, which would use an IR system. The application would free staff to handle only callers needing further attention, such as those developing symptoms or those who could not be reached (potentially noncompliant with quarantine). In the Taiwan SARS experience, 113,132 people were quarantined with only 133 (0.1 percent) having suspect or probable disease diagnosis. Of the 108 who were tested, only 21 were SARS positive via polymerase chain reaction. Only 286 persons (0.2 percent) were fined for violation of quarantine. This demonstrates that less than 1 percent of those in quarantine needed much more than periodic monitoring. Automating much of that monitoring with a tool such as the QI

Monitoring Application could be very useful. This application is summarized here and fully described in Appendix 4, Developing an Interactive Response Tool.

QI Monitoring Application. The QI Monitoring Application has the capability to automatically place outbound calls to individuals in home quarantine/isolation to assess their current health status. The application calls the quarantined person at specified times, provides messages in English or Spanish identifying the purpose of the call, requires the person to select an option that reflects his or her current health status (using temperature as a decision point), transfers him or her to an information provider for assistance if indicated, and provides information about who to call if he or she needs assistance before the next monitoring call.

Though this application was developed for use with an IR system, it could be used without such technology. The call flows, decision trees, and message scripts could guide call center staff in how to handle calls and what information to provide. The application could be adapted to other scenarios that might require telephoning individuals, such as sheltering in place strategies or followups to vaccinations. Public health agencies may want to develop referral protocols and guidance for call center staff in handling situations in which a quarantined individual needs food, medication, or financial assistance.

Outpatient Drug Information/Adverse Event Reporting

Significance. The CDC's Cities Readiness Initiative program requires that participating cities prepare plans for mass prophylaxis with Strategic National Stockpile assets. Depending on the potential for exposure, this could result in thousands or millions of people being dispensed antibiotic medications. Health call centers can support these efforts by providing information about the incident and the supplied medications, as well as collecting any potential adverse event reports.

Scenarios. This response capability primarily is applicable for the two National Planning Scenarios involving agents treated with antibiotics: Aerosolized Anthrax and Plague Outbreak. Other scenarios that involve either mass vaccinations (Pandemic Influenza Outbreak) or wide-scale use of medications for treating radiation exposure (Nuclear Detonation, Radiological Dispersal Devices) or potentially Food Contamination may also require this response capability.

Current Examples. The HELP program has collected adverse event information regarding smallpox using the Vaccine Adverse Event Reporting System (VAERS) form fields (vaers.hhs.gov/).²⁸ In addition, drug information centers collect information for the FDA's MedWatch reporting program (www.fda.gov/medwatch/), as well as handling drug information and identification calls. Poison control centers have much experience in handling drug identification calls, which comprise 61 percent of their non-exposure calls.⁹

Technology. In addition to the call center technology and data collection systems mentioned previously, staff would require drug identification resources such as online

searchable databases such as Drugs.com (www.drugs.com/pill_identification.html) and RxList.com (www.rxlist.com/interact.htm) or commercial database IDENTIDEX System (www.micromedex.com/products/identidex/). MedWatch and VAERS form data fields could be incorporated into data collection systems or paper forms could be completed.

Staffing. Trained information providers could manage providing drug identification assistance to the public. Clinicians would be more appropriate for collection of adverse drug or vaccine event reports.

Proposed Resource. We have developed the Drug Information (DI) Application to support mass prophylaxis with antibiotic drug strategies using an IR system. The IR system application would assist callers in the identification of the drug they were given and provide them with information on how to take it and its potential adverse reactions. The application would allow public health agencies to concentrate on operating mass dispensing sites and allow health care providers to care for those who are ill. This application is summarized here and fully described in Appendix 4.

DI Application. The DI Application allows callers to identify medications based on the appearance of the antibiotic drugs that are being dispensed at POD locations during a public health emergency. The callers are given clear directions from menu messages and can repeat messages or drug descriptions. This application accommodates one language selection (English), but it could be modified for additional language selections.

Though this application was developed for use with an IR system, it could be used without such technology. The call flows, decision trees, and message scripts could be used without technology to guide call center staff in how to handle calls and what information to provide. The application could be adapted to other scenarios that might require mass administration of medications or vaccinations and to provide relevant information.

Mental Health Assistance/Referral

Significance. Call centers providing health information and support will help to relieve anxiety and stress among the public, but some callers may need further assistance. Call center staff can assist these callers by referring them to community mental health resources.

Scenarios. Most of the 15 National Planning Scenarios will result in varying degrees of community fear, panic, anxiety, and even depression.

Current Examples. Countless suicide prevention and counseling hotlines currently exist and are run by trained mental health staff. The National Suicide Prevention Lifeline provides a 24-hour toll-free service that routes callers to crisis centers across the country (www.suicidepreventionlifeline.org/). Additionally, nurse advice lines are capable of handling patients with depression. Poison control centers regularly receive suicide and intentional harm calls.

Technology. Besides the call center technology and the data collection systems mentioned previously, staff would require protocols and referral resources to access agencies providing counseling and mental health services.

Staffing. Information providers would not necessarily be trained in assessing mental health concerns but could adequately provide referral assistance with training. Clinicians trained in identifying mental health warning signals would be an integral resource for assisting such callers.

Proposed Resources. No specific resources are proposed. However, it is recommended that good risk communication principles be used for handling callers who are anxious or under stress.⁴ Call center staff should be trained on how to handle calls from those under stress. The Kansas Department of Health and Education developed phone bank operator training that includes communications protocols, techniques, and role playing for a variety of health emergencies.³⁰ The CDC also offers good disaster mental health resources (www.bt.cdc.gov/mentalhealth/).

It is recommended that call centers review the content of their recordings and FAQs to determine if they can be improved to reduce caller anxiety. Using a voice for recordings that is pleasant and that mentions appropriate reassurances such as “there will be adequate supplies of medications for everyone” will help to alleviate caller anxiety. Following unpleasant information with positive statements also can help in many situations. The Center for Risk Communication (www.centerforriskcommunication.com) provides information on communication methods for high concern, high stress, or emotionally charged issues based on behavioral-science research and practice.

4. Develop a mechanism to test and evaluate the model with a local exercise.

HELP Model Testing

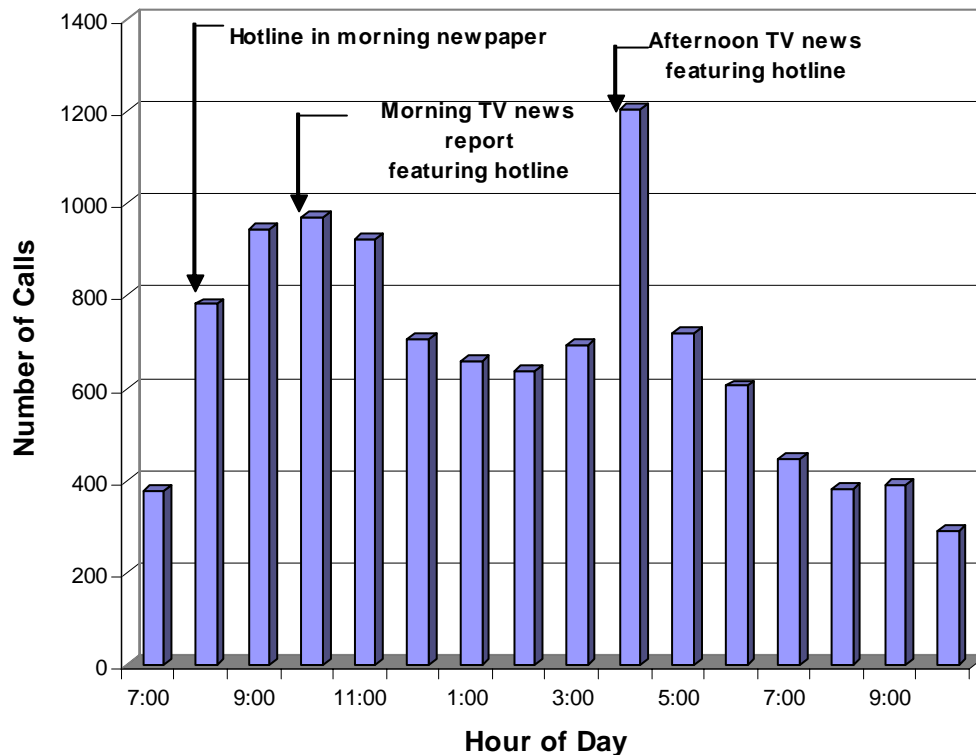
The HELP model has been tested in more than 3 years of daily operations and response to several major health events. The HELP model has made it possible for us to provide consistent, accurate, and up-to-date information during bioterrorism exercises and public health emergencies in partnership with the Colorado Department of Public Health and Environment. HELP served as a proving ground for the implementation of some HEALTH concepts and strategies. Since its launch, the HELP program has continually developed as it responded to three major health events in Colorado: the deadliest WNV outbreak in the United States (2003), an influenza outbreak with early increased pediatric deaths (2003/2004), and an influenza outbreak during a vaccine shortage (2004/2005).^{26,28} The HELP program provides a model for disseminating and collecting information that, to date, has involved handling more than 75,000 calls related to several health events and outbreaks.

The first test of the HELP model occurred on the day the program began daily operations to support a WNV outbreak in Colorado. The service began answering

telephone calls at 7:00 a.m., and a press release announcing the first human case of WNV in the State occurred within the next few hours. State health department staff handled up to 1,000 calls regarding WNV the previous year (first year of the outbreak in the State) and expected several times that number during the second year of the outbreak because of its greater potential to result in human disease. However, the 12,500 calls over the next 3 months were much more than expected. During the same period, human WNV cases surpassed 2,500, and human deaths totaled 47. Figure 5 depicts the average call volumes to HELP by hour of the day for the initial 7 weeks. During that time, call volumes averaged greater than 1,500 calls weekly and 220 calls daily, with peak call volumes of 2,229 in 1 week, 524 in 1 day, and 178 in 1 hour. These call volumes accurately reflected the public's demand for information, since all 96 channels (individual phone lines) dedicated to HELP were never all used at once. If that were to occur, additional callers would have received a busy signal, and we would have no means to determine the number of callers that could not get through.

The drivers for these call volumes involved both the status of the outbreak in the news each day (number of human cases and deaths) and the time of day that such news was disseminated by the media. As Figure 5 shows, hourly spikes in call volume were related to times of television newscasts, usually featuring the HELP toll-free phone number as part of the news crawler during updates. Therefore, we began to staff up for certain hours to better accommodate those volume surges. Staffing was usually limited to no more than four information providers at a time (the number that our funding from the State health department could support). Therefore, we used our initial announcement to relay the most requested information to alleviate a caller's need to speak with staff. On average, 60 percent of callers listened to the recording and then terminated the call; the remaining 40 percent chose to remain on the line to speak with a staff person. This indicated to us that most callers were having their concern addressed with recorded information; otherwise they would have waited in queue to speak with a staff person (those waiting at least 6 seconds past end of recording were counted as those needing to speak with staff). It is important to keep announcements and recordings reasonable in length—less than 30 seconds and only sparingly up to 1 minute. The average of 60 percent of callers having their concern addressed by the initial announcement has remained fairly constant over the last 3 years and for a range of health events.

Figure 5: Average Call Volume to HELP by Hour of the Day From July 22 to September 7, 2003



A strategy to assist those waiting in queue (which has at peak times reached up to 20 callers with some waiting up to 30 minutes) is to cycle recordings of other frequently requested information in hopes of answering their questions while they are waiting. Many callers may get the information they require from those messages and no longer need to wait for assistance. This ensures that staff is assisting those who could not be helped easily by other means. The recordings can also refer callers to other information sources (such as the Internet) that they may opt to explore instead of waiting in queue or investigate first before calling back. We have found this most effective for inquiries about finding flu vaccination sites that could be easily located via a Web site. We typically cycle a recording stating, “We are experiencing high call volumes at this time; please consider calling back at another time,” for those in queue for more than a few minutes. Callers appreciate being kept informed about wait times, and technology that estimates queue times for callers can be used.

Assuming that messaging will work for a majority of callers, the number of staff and phone lines required to deliver information to the same number of callers can be

decreased. Here is the example that we used for calculating the resources needed to handle 28,000 callers depending on an event lasting from 1 to 5 days.

Event Duration (Days)	1	2	3	4	5
Average Calls/Day	28,000	14,000	9,333	7,000	5,600
Staffing (FTE)	354	181	123	93	76
Phone Lines	401	213	148	116	95

The more callers who can be handled effectively with messaging strategies, the fewer staff and phone lines will be needed (good recorded messages can deliver information consistently and at a constant rate).

Event Duration (Days)	1	2	3	4	5
Agent Calls/Day	11,200	5,600	3,733	2,800	5,600
Message Calls/Day	16,800	8,400	5,600	4,200	3,360
Staffing (FTE)	146	76	52	40	33
Phone Lines	174	95	68	54	45

These calculations assume that only 40 percent of callers speak with an agent for an average call length of 293 seconds, including after call activities; the remainder receive only messages/recordings.

Furthermore, by reviewing the concerns of callers speaking with staff, managers can determine if additional information should be added to the initial announcement, added to queue messages, or disseminated by the media or other sources in hopes of meeting demand without call center staff involvement.

All of these strategies for providing information to the greatest number of callers with limited resources greatly assisted us in handling the call volumes related to the 2003/2004 influenza season. From November 17, 2003 to January 31, 2004, HELP received almost 24,000 calls with peak call volumes of 7,145 weekly, 2,565 daily, and 345 hourly. During influenza seasons, many callers are trying to locate vaccination sites. We have successfully referred callers with Internet access to a Web site that they can easily use to find these locations in Colorado. We provided the direct URL address in our initial announcement to off-load many callers to this resource. Our information providers use the same Web site to assist callers in finding vaccination locations. The announcement content seemed to be effective, since those who waited to speak to staff for that reason prefaced it by saying "Sorry, I know I could use the Internet, but I do not have access." A reporter doing an influenza story showed viewers how to locate vaccination sites using a computer on the air and assisted in reducing the overall HELP call volume almost immediately. Partnering with media can greatly assist in providing the most requested information and reducing the demand on hotlines during events.

IR Applications Evaluation

It is the challenges we encountered with surges in demand to HELP that led us to develop and test the four IR applications. Appendix 4 provides the full details of the two

exercises used to evaluate the applications. This is a brief summary of those exercises and user feedback about improving each application:

- Quarantine/Isolation (QI) Monitoring.
- Point of Dispensing (POD) Locations.
- Drug Identification (DI).
- Frequently Asked Question (FAQ) Library.

Quarantine/Isolation Monitoring. A prototype version of the QI Monitoring Application was tested in 12 rural volunteers who served as “isolation cases” in conjunction with an influenza vaccination exercise in October 2005. Data were collected in the volunteers and entered into the State health department’s Outbreak Management System.

The application was revised to reflect many of the user suggestions. In an exercise in May 2006, the revised and more fully developed QI Monitoring Application and the other three applications were evaluated in an urban user group consisting primarily of local health personnel from 10 counties. The goal of the second exercise was to test the ability of the four IR applications either to initiate contact and determine health status of those in quarantine or to effectively communicate key information to users calling in to the applications.

An issue realized from this exercise was that the application could not guarantee quarantine compliance. Even if someone answered the application during every calling period, there was no way to prevent another person from answering on behalf of the person in quarantine. Requiring entry of data to specific prompts like “last 4 digits of social security number” would not guarantee the identity of the person who answered, as almost any identifying information could be shared with another. Adding confirmatory prompts would make the application more complicated and could result in more people finding it difficult to use while being in compliance. Agencies using home quarantine strategies could consider certain qualifications for individuals to reduce undetected circumvention, such as requiring a land line (and not a cell phone) for contact and agreeing to have call forwarding features disabled. Therefore, it will be important to develop effective risk communication messages to the public and adequate support for those in quarantine to assure good overall compliance. Public health agencies will find it difficult to monitor individuals in home quarantine without strategies to reduce the need for staff. This application monitored up to 70 percent of quarantined persons demonstrating compliance with few personnel resources. The QI Monitoring Application (or some similar monitoring strategy) will permit limited staff resources to concentrate on obviously noncompliant individuals and those with additional needs or to manage the myriad of other response actions required in a health emergency.

The second version of the QI Monitoring Application required the person answering the call to indicate their most current temperature reading as an objective means to monitor their health status. The public health departments helping to design this exercise believed that providing a thermometer to everyone in quarantine would be realistic and would help to identify those potentially developing signs of illness. Those selecting the option for a temperature reading of less than 100°F were considered well but also were given an option to select if they needed to speak to someone. Those selecting the option for a temperature reading equal to or greater than 100°F or who indicated difficulty in taking their temperature were transferred to the HELP service for assistance. For testing results of the second version, see Appendix 4.

Concern was raised about whether this application could work for everyone, including the elderly and those with special needs. It was never our intention that the application could work for everyone, rather that it could work for most. It would be at the discretion of public health agencies coordinating quarantines to decide which individuals this application could assist in monitoring, thereby freeing resources to monitor those with additional or special needs.

Drug Identification (DI). The DI Application was tested to determine how effective such an application would be to assist the public in identifying antibiotic drugs that may be dispensed during certain public health events. The underlying challenge is that more than one brand of the same medication will be distributed to the same household during an emergency, and each may have a different appearance. For example, there are several manufacturers of doxycycline. Figure 6 contains the five different appearances of 100 mg doxycycline preparations that are contained in local and national stockpiles. This IR application offers a self-service alternative for callers to correctly identify drugs by type (capsule or tablet), shape, color, and imprints rather than calling their doctor or pharmacist. The application can identify, in addition to doxycycline, ciprofloxacin and Levaquin, which are other antibiotic drugs in many local stockpiles.

Figure 6. The Five Common Product Appearances for 100 mg Doxycycline Preparations



Product A



Product B



Product C



Product D



Product E

Point of Dispensing (POD) Locations. The POD application was tested to determine if callers entering their 5-digit zip code could get correct POD locations in a self-service manner. This application could be modified to provide any zip-code-specific information and to ensure:

- Consistent, accurate information based on zip code.
- Collection of zip code data to characterize events (situational awareness—caller locations and the potential need for more media messaging).
- Expanded capacity for handling surges since calls are handled without personnel.
- Support for mass prophylaxis/immunizations, evacuations, or sheltering in place information.

Volunteers were assigned to evaluate this application by calling a toll-free number, entering a 5 digit zip code, and recording that zip code and the location they were given on an evaluation form. We received all evaluations back (100 percent return rate), and all recorded the correct POD location for their entered zip code.

Frequently Asked Question (FAQ) Library. The FAQ Library Application was tested to evaluate the ability of users to navigate a library of messages and to obtain desired information. Our HELP program uses this library for handling callers after hours with great success by allowing self-service information delivery that is consistent and accurate. The application collects entered data to characterize the information needs of the public (the entered zip code for situational awareness—identifying public information

needs and where to target them). The application is able to expand capacity for handling surges and is capable of adapting to different events.

We met our overall exercise objectives and obtained excellent feedback to improve the tested applications. We also obtained important information on user acceptance for these IR applications. Although evaluations were mostly favorable for all four applications, the FAQ Application seemed more acceptable than the DI Application (perhaps because the latter concerned medications to be taken). The comments and evaluations of these applications should help public information officers in determining which ones may be acceptable for different events and in developing messaging strategies. These results also suggest areas for potential community outreach efforts for public health agencies to create a more informed public. One lesson learned is that the tools will be only as good as the information that is developed for them and how it is provided to the public.

Chapter 5. Recommendations

In reviewing disaster scenarios for expected community needs, it becomes clear that we must help the public make informed decisions and care for themselves during severe health events. It is only with such strategies that we can hope to alleviate many potential demands on health care delivery systems and to accommodate those most in need. Assisting community health call centers to develop certain response capabilities is a part of that overall strategy. By employing the scenario-specific models and tools in this report, health call centers can increase their ability to support the following areas:

- Health information.
- Disease surveillance.
- Triage/decision support.
- Quarantine and isolation support/monitoring.
- Outpatient drug information/adverse event reporting.
- Mental health support/referral.

As this report has illustrated, four of the Department of Homeland Security National Planning Scenarios afford the best opportunity to involve most of the potential response capabilities for community health call centers:

- Biological attack – aerosol anthrax.
- Biological disease outbreak – pandemic influenza.
- Biological attack – plague.
- Biological attack – food contamination.

This does not imply that health call centers could not play an important role in responses to other scenarios; rather, that developing tools related to the response needs of these four biological scenarios affords the greatest potential for success.

Poison control centers, nurse advice lines, drug information centers, health agency hotlines and local/State/Federal public health agencies were chosen as target audiences for the proposed scenario-specific models and applications because they are familiar with basic physiological responses to particular health threats due to the knowledge and skills gained in their area of health care. The professionals employed by such centers have experience in assessing patient status, problem-solving, and working with symptomatic patients over the phone. During any health emergency, these centers could continue to

provide regular services while expanding services to provide information and support related to the event. Much of the expansion of services could be handled with nonclinical staff. In this way, these centers could help with surge capacity and informing the public about health issues so that they can make informed decisions and care for themselves.

It seems wise to build on the expertise, credibility, and infrastructure of community health call centers when planning for emergency responses. Expanding their capabilities to inform, educate, and assist the public with their health concerns can free the health care delivery system to most effectively use their limited resources to provide care to those most in need. This approach can especially aid in handling those at low risk for injury or illness, who may have valid fears and concerns that, without a mechanism to get information, could lead them to overtaxed hospitals and health departments.

This does not guarantee compliance with official recommendations, but it should help the public to understand the risks or consequences of their choices. However, call centers that are embedded in the community and familiar to the public should be well received when providing support during a health emergency.

Call centers attempting to provide the community services described here should do so in cooperation with the public health authority that, by statute, is responsible for coordinating health and medical services in response to public health and medical care needs following a major disaster or emergency, or during a developing potential medical situation. This coordination with the public health authority will help to ensure consistency with other response measures.

The model and tools proposed in this report should be used as part of a comprehensive public information strategy that includes the use of:

- Mass media to provide the public with information on preventive measures, home care management, and the appropriate time to seek health care services.
- Community health call centers to reinforce mass messaging and to provide additional and more tailored information to individuals with questions and concerns, as well as to review these issues for their value as potential mass media messages.
- Community health call centers to assist with outpatient (home care) monitoring and support, thereby helping to extend the reach of public health and health care systems into households.
- Information collected by the call centers for situational awareness and disease outbreak management and control.

In an emergency, the public may view hospitals as “safe havens”—places to go for food, shelter, protection, and medical attention. However, particularly in the event of a transmissible infectious disease in which hospitalized patients represent the sickest

patients in the community, the concept of hospitals as “safe havens” may not be applicable. It may become more advantageous to manage and support the public in their homes with the assistance of health call centers. Community response planners will need to reinforce the concept of the home as a “safe haven” in their risk communication strategies and develop measures to support this concept in all aspects of their planning efforts. The possibility that some rudimentary degree of medical care will need to be delivered in the home setting should be included in public preparedness and education campaigns.

Integration With Current Programs and Initiatives

The concept of using community health call centers, the proposed model, and the IR applications fits well within programs and initiatives at the State and Federal levels. Such response resources can easily fit within the National Incident Management System (NIMS) that provides a consistent nationwide template to enable all government, private-sector, and nongovernmental organizations to work together during domestic incidents.

By working within the NIMS framework and coordinating with local authorities, health call centers can ensure that the public receives accurate, coordinated information, helping to decrease panic and calls to emergency management. In the same manner, call centers can participate in ongoing operations, such as quarantine and isolation management or Strategic National Stockpile support, as part of the multi-agency coordination system, a combination of facilities, equipment, personnel, procedures, and communications integrated into a common framework for coordinating and supporting incident management.

Federal and State Governments have set forth several requirements to be prepared for a disaster, including pandemic influenza. In Homeland Security Presidential Directive 8: National Preparedness, there are 36 essential capabilities on the Target Capabilities List (TCL) that various levels of government should develop and maintain.³¹ Among those TCLs is the requirement to strengthen medical surge and mass prophylaxis capabilities. Included in the National Preparedness Goal is supporting medical target capabilities for medical surge, such as isolation and quarantine.³² The proposed model and IR applications provide support for these efforts by allowing residents to identify and locate their point of dispensing (POD) location for mass prophylaxis and providing a mechanism to track and monitor patients in isolation and quarantine in order to assist public health agencies.

The State of Colorado, like many others, has a quarantine and isolation component in its pandemic influenza plan. The Pandemic Influenza Annex to the Colorado Department of Public Health and Environment Internal Emergency Response Implementation Plan gives the authority to isolate or quarantine persons, groups of people, or buildings in Colorado, and at the recommendation of the Governor’s Expert Emergency Epidemic Response Committee, to limit or close public gatherings and restrict the movement of people.⁴⁰ Containment strategies range from those affecting individuals (e.g., isolation of patients) to measures that affect groups or entire communities (e.g., monitoring of

contacts, cancellation of public gatherings). Guided by the current epidemiological data, State and local public health officials will implement the most appropriate of these measures to maximize the impact on influenza transmission and to minimize the impact on individual freedom of movement. The HELP program is included in the plan as a means to gather surveillance data for situational awareness and to support efforts to monitor those individuals placed in isolation or quarantine. Using the proposed IR applications will aid in providing this response capability.

Public Health Communications and Education

The National Association of County and City Health Officials has some timely recommendations to prepare for pandemic influenza. First is to engage the community and bring all stakeholders together in a way that makes sense. An essential piece to preparing any community for a public health emergency is involving stakeholders in the planning. Community members need to be heard, and if they feel that their views are not only being considered but also incorporated into the planning process, they will be more likely to support whatever plan is created. Second is to empower people to do their own planning. Third is to establish excellent lines of communication, the key to education about and awareness of any public health issue. These recommendations support the concept of health call centers and their use of IR technology to communicate with the public:

“Dissemination and sharing of timely and accurate information with the health care community, the media, and the general public will be one of the most important facets of the pandemic response. Advising the public in actions they can take to minimize their risk of exposure or actions to take if they have been exposed, will reduce the spread of the pandemic and may also serve to reduce panic and unnecessary demands on vital services.”³³

The National Governors Association also stresses the importance of public communications in order to build a trusted relationship with the response community and enhance the public’s understanding of pandemic influenza. Responses to pandemic influenza must provide for effective communication to the public to minimize negative behaviors, accentuate positive actions, and limit the psychosocial and psychological impact of imposing public health measures that include movement restrictions. These messages should be developed and trained and trusted messengers should be selected now.³⁴ For this reason, established and community-embedded health call centers are a good fit to partner with public health agencies to provide such communications.

A major goal of public health education messages is to ensure that the public has the knowledge to protect itself. Prevention and infection control are the first line of defense, but there are other education topics as well. Dispelling rumors keeps the public properly informed and less prone to panic because of misinformation. Public health authorities have the responsibility to explain the rationale behind disease control measures, to explain why these measures are necessary, and to ensure that information is current and that messages do not contradict one another.³⁵ Health call centers can partner with public

health agencies to relay such information to the public in a consistent, accurate, and up-to-date manner.

In “Components of Effective Disaster Public Education and Information,” (December 2005) a working group of the Emergency Management Accreditation Program emphasizes the correlation between effective public education and coordinated, effective disaster response and recovery outcomes. The report outlines steps for creating comprehensive and understandable public education messages so that residents can be better informed and better prepared. The report notes that, “Federal and State Governments must support local capabilities to provide effective public education and information through continuity of authority, emphasis, message, and language, as local and State public education and information have a direct impact on successful outcomes in a disaster.”³⁶ It is such local capabilities that health call centers have to offer the governments and communities they serve.

Blendon et al. reported that most Americans favor the use of quarantine as a weapon against contagious diseases like SARS and pandemic influenza but are far less comfortable with strict enforcement and monitoring measures. While 76 percent of Americans surveyed said that they favor quarantining those potentially exposed to serious contagious diseases, only 42 percent supported a compulsory quarantine under which those who refused to comply could be arrested. However, 75 percent of those surveyed would favor periodic telephone calls to monitor those in quarantine.²⁴ This suggests that a quarantine strategy using a health call center and a tool such as the QI Monitoring Application would be favorable to most Americans and likely to experience good compliance.

The HELP model, which has become established in the community and is used on a daily basis, can be a resource for times of disaster, giving people the risk-based messages that include how to care for themselves and their families in order to mitigate a threat. The various call flows are designed to give reassurance as well as direction and information on the appropriate response measures. Such information can substantially change the behavior of the caller. Our report on the Denver Health NurseLine demonstrated that 70 percent of patients complied with nurse advice line recommendations, though the same percentage had a different plan for their health care prior to calling.¹⁰ Patients who called were already aware of a need for information and were receptive to changing their behavior based on the information they received. It is not unlikely that the same behavioral changes would be seen in an emergency situation with persons contacting a health call center and perhaps even those receiving information via an IR system.

Special Needs Populations

Special needs populations will need customized forms of contact during an emergency. The proposed IR applications take into consideration some special needs communities, in particular the Spanish-speaking population. By developing most of the IR applications to accommodate both English and Spanish, a majority of callers will have

the option to use such strategies to get information on the disaster. Depending on a community's demographics, it may want to offer additional language options for callers. Planners will need to determine if there will be sufficient demand to have announcements recorded in a particular language or to have those callers speak with a staff person using a translation service. The vision impaired will also likely find it easy to retrieve information via their telephone rather than from printed materials or the Internet. Many call centers have relied on TTY/TDD technology to communicate with the hearing impaired, though text messaging and e-mail communications are becoming more prevalent. The IR applications do not support TTY/TDD, and those callers would need to interact with a staff person to get information. The use of toll-free numbers should enable those without a phone in their home, a cell phone, or without even their own residence to call from any public phone at no cost.

Volunteer Use in Call Centers

Volunteers can assist health call centers in responding to public inquiry. The volunteers would need to have a vested interest in the community and be able to think on their feet, work under pressure, and answer the questions. To find these individuals, a call center can look to established volunteer groups, church organizations, or recognized nongovernment organizations like the Salvation Army or the American Red Cross. Planners who choose to use health care workers to staff a call center may want to look for volunteers through the Health Resources Services Administration (HRSA) Emergency Systems for Advance Registration of Volunteer Health Professionals program that each State is developing. An important caveat made by HRSA is that these individuals will need to identify themselves to callers as volunteers helping the State.³⁷

When using volunteers in a call center, it is best to be aware of the legal implications of volunteer use in a disaster situation. Good Samaritan statutes are laws enacted by various States that protect health care providers and other rescuers from being sued when they are giving emergency help to a victim. The rescuer has to use reasonable, prudent guidelines for care during the response. Under such laws, the assistance must be voluntary, the person receiving the help must not object to being helped, and the rescuer's actions must be a good-faith effort to help.³⁸

The Federal Volunteer Protection Act provides that no volunteer of a nonprofit organization or governmental entity shall be liable for harm caused by an act or omission of the volunteer on behalf of the organization or entity if the volunteer meets certain requirements.³⁹ It is very important to note that this Federal law preempts State laws to the extent that such laws are inconsistent, except that it does not preempt any State law that provides additional protection from liability relating to volunteers or to any category of volunteers in the performance of services for a nonprofit organization or government entity. Health call centers that use volunteers should contact their legal counsel to ensure that their use is in compliance with applicable laws, that volunteers are covered under their liability insurance for such use, and that volunteers are properly trained for such activities.

Public Information Partnerships

Public information partnerships between health call centers and public health agencies prove that together they can meet the expected needs of communities during health emergencies including: improving information support and surge capacity, expanding surveillance signals, and collecting data for situational awareness. These partnerships help meet the new demands on public health agencies, increasing their response capabilities and access outside of the 9:00 a.m. to 5:00 p.m. work day, handling rapidly evolving information while maintaining control, and enabling members of the public to care for themselves and their families by supplying the information to help them make decisions.

The need for such partnerships will remain constant or potentially increase, since public health events will continue to occur. These events will require effective, structured, and coordinated systems for providing public information and support as part of the response. The HELP model has been proven to be a cost-effective, efficient, reliable, and adaptable component of Colorado's readiness response model for any public health emergency. The HELP model offers the promise for similar response capabilities for other community health call centers working in partnership with their public health agencies. These community resources will likely have robust infrastructure to serve as strong platforms that can incorporate the proposed tools and adapt them as needed.

Model Utility and Adaptability

This model and the IR applications were applied locally and statewide, but they could potentially be adapted for interstate and Federal use. There may be legal risk implications for clinical personnel using decision support and triage strategies across State lines. The National Council of State Boards of Nursing (www.ncsbn.org) is working to secure mutual recognition of nurse licensure across States that may help with this issue. However, a larger issue concerns the coordination of messages across various levels of government to ensure consistency and public trust. It may be difficult for public health and safety agencies across all levels of government to agree on specific strategies and develop unified messages. It may be easier to develop response resources such as the HELP model and IR applications on a statewide or smaller scale to avoid the difficulties in regional and national coordination. Planners at various levels of government should consider this challenge in their planned application of such resources.

The model and applications that we have developed are largely informational in nature and can be delivered easily with trained nonclinicians or can be automated. However, the applications should all be employed with sufficient back-up support such as the HELP platform so that users can always get the proper assistance.

In our experience, it has been valuable to have systems and processes that can be adjusted to the changing needs of emerging public health events. This has included the ability to:

- Rapidly change FAQ content and public health messages.
- Handle surge responses through a variety of mechanisms
 - Using recordings/announcements
 - Using an interactive response system with interactive response applications
 - Partnering with media to deliver information
 - Having trained ancillary staff.
- Learn from experiences.

Some of the lessons learned from more than 3 years of operating the HELP program include:

- Call volume is driven by the event and media attention—anticipate call volume surges related to morning, afternoon, and evening news broadcasts.
- Media organizations are willing to assist with disseminating information, including hotline numbers regularly displayed in television news crawlers.
- Adaptation to include the latest local and State health department messages is necessary to meet both public health and public needs.
- Surveillance, though not an intended purpose of the program, became an important function due to the utility of structured data collection (situational awareness) and the ability to identify emerging issues (sentinel event detection).

Operating a public informational resource requires the ongoing need to adapt, reassess, and improve. There always will be further challenges to address:

- Testing the IR applications in various community groups (non-English speakers, seniors) and determining if there are any issues with their use.
- Improving public messages and FAQ information content.
- Determining other information and tools for meeting the needs of health emergency events.

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Appendixes

Appendix 1. National Planning Scenarios Analysis Matrix

Scenario Number	Scenario Title	Scenario Description	Executive Summary			Mission Areas Activated		Potential Health Call Center Response Capabilities						Community Response
			Casualties	Infrastructure Damage	Evacuations/Displaced Persons	Evacuation and Shelter	Victim Care	Health Information	Disease/ Injury Surveillance	Triage/ Decision Support	Quarantine and Isolation Support	Outpatient Drug Info/ Adverse Event Reporting	Mental Health Assistance/ Referral	Mass Risk Communication
1	Nuclear Detonation - 10 Kiloton Improvised Nuclear Device	This scenario postulates a 10-kiloton improvised nuclear device (IND) detonation in a large metropolitan area.	Hundreds of thousands	Total destruction within radius of 0.5 to 3 miles	100,000 seek shelter in safe areas (decontamination required for all before entering shelters); 250,000 told to shelter-in-place as plume moves across region; 1 million+ self-evacuate from major cities.	Evacuation and/or sheltering of downwind populations required. Actions needed: monitor/ decontaminate evacuees, protect schools and day care facilities, provide shelter/reception facilities.	Decontamination and both short-term and long-term treatment; hospitals overwhelmed; level of care may be lower than normally expected							
2	Biological Attack - Aerosol Anthrax	Dispersal of the anthrax takes place in a densely populated urban city with a significant commuter workforce. The exposed population will disperse widely before the incident is detected.	13,000 fatalities and injuries	Minimal, other than contamination	25,000 seek shelter (decontamination required); 10,000 instructed to shelter-in-place; 100,000 self evacuate out of affected areas	Evacuation and treatment will be required; provide warnings to the population-at-large and the population-at-risk; need to notify people to shelter-in-place and/or evacuate	Care to the ill must be provided and should include disbursing PEP/vaccinations and establishing treatment/distribution centers							
3	Biological Disease Outbreak - Pandemic Influenza	Pandemic influenza strikes locations across the country. All entities must use pre-existing resources. Available medical supplies will be distributed as available. Health care systems will not be able to activate MOUs with neighboring locales.	15% attack rate; 87,000 fatalities; 300,000 hospitalizations	None	No evacuation required; shelter-in-place or quarantine instructions given to certain highly affected areas	Evacuations not necessary; quarantine has not typically been used with much success to stop the spread of influenza	Antiviral drugs for treatment of most ill; ventilators may be necessary for many; at-home care and OTC medications for most							
4	Biological Attack - Plague	Pneumonic plague is released into three main areas of a major metropolitan city. Included is rapid dissemination to distant locations through foreign and domestic travel.	6,000 illnesses, unknown fatalities	None	No evacuation needed; shelter-in-place or quarantine to certain highly affected areas; possible large-scale self-evacuation from affected communities	Transport and treatment of some victims will be required; self-quarantine through shelter-in-place may be instituted	Treatment or prophylaxis with ventilators and antibiotics, as well as information measures to prevent spread of disease; advanced treatment for those with pneumonia							
5	Chemical Attack - Blister Agent	A light aircraft sprays chemical agent YELLOW into a packed college football stadium. The agent directly contaminates the stadium and the immediate surrounding area, and generates a downwind vapor hazard.	150 fatalities; 70,000 hospitalizations	Minimal	More than 100,000 evacuated; 15,000 seek shelter in immediate area (decontamination required)	Evacuation and/or sheltering of downwind populations in a 360 degree arc around release site required until contained	Decontamination for tens of thousands of people and short-term and long-term medical treatment							
6	Chemical Attack - Toxic Industrial Chemicals	Grenades and IEDs cause significant explosions at a fixed facility petroleum refineries. Simultaneously multiple cargo containers at a nearby port explode aboard or near several cargo ships with resulting fires.	350 fatalities; 1,000 hospitalizations	50% of structures in area of explosion	10,000 evacuated; 1,000 seek shelter in safe areas; 25,000 instructed to temporarily shelter-in-place as plume moves across region; 100,000 self-evacuate out of region	Evacuation/sheltering/protection of downwind populations will be required	Injuries to be treated will include trauma burns, smoke inhalation, severe respiratory distress, seizures, and/or comas; short- and long-term treatment will be required, as well as decontamination							
7	Chemical Attack - Nerve Agent	Sarin vapor is released into the ventilation systems of three large commercial office buildings in a metropolitan area. The agent kills 95% of the people in the buildings, and kills or sickens many of the first responders. In addition, some of the agent exits through rooftop ventilation stacks, creating a downwind hazard.	5,700 fatalities (95% of building occupants); 300 injuries	Minimal, other than contamination	Temporary shelter-in-place instructions are given for 50,000 people in adjacent buildings	Evacuation/sheltering/protection of downwind populations will be required; large numbers of worried well swamping the medical system	Decontamination and monitoring of individuals as they are allowed to leave their buildings; hundreds will require hospital treatment							
8	Chemical Attack - Chlorine Tank Explosion	Using a low-order explosive a storage tank man-way is ruptured, releasing a large quantity of chlorine gas downwind the site. Secondary devices are set to impact first responders.	17,500 fatalities; 10,000 severe injuries; 100,000 hospitalizations	Immediate explosion area and metal corrosion in areas of heavy exposure	100,000 instructed to temporarily shelter-in-place as plume moves across region; 50,000 evacuated to shelters in safe areas; 500,000 self-evacuate out of region	Evacuation/sheltering/protectons of downwind populations will be required	Injuries to be treated will include respiratory difficulty or severe distress and trauma; short- and long-term treatment may be required							
9	Natural Disaster - Major Earthquake	A 7.2-magnitude earthquake, with a subsequent 8.0 earthquake following, occurs along a fault zone in a major metropolitan area of a city, greatly impacting a six-county region with a population of approximately 10 million people.	1,400 fatalities; 18,000 hospitalizations	150,000 buildings destroyed; 1 million buildings damaged	300,000 homes destroyed; 250,000 seek shelter in safe areas; 250,000 self evacuate the area	Structural engineers inspect critical buildings, bridges, freeways, waste facilities, etc; inspection teams deployed to inspect hundreds of homes for safe habitability	Activation of task forces for delivery of mass care and health and medical services; temporary housing strategies considered							
10	Natural Disaster - Major Hurricane	A Category 5 hurricane hits a Major Metropolitan Area (MMA). Sustained winds are at 160 mph with a storm surge greater than 20 feet above normal. Massive evacuations are required. Certain low-lying escape routes are inundated by water anywhere from 5 hours before the eye of the hurricane reaches land.	1,000 fatalities; 5,000 hospitalizations	Buildings destroyed, large amounts of debris	1 million evacuated; 150,000 seek shelter in safe areas; 200,000 homes destroyed	State and local officials have time to execute evacuation plans; roads leading from the area are overwhelmed and massive traffic jams hinder the evacuation efforts; need to provide for temporary shelter and interim housing; permanent housing support will also be required	Medical assistance; shelter and temporary housing assistance; emergency food, water and ice provision; sanitary facility provision							
11	Radiological Attack - Radiological Dispersal Devices	Dirty bombs containing cesium chloride (CsCl) are detonated in three separate, but regionally close, moderate-to-large cities.	180 fatalities; 270 hospitalizations; 20,000 needing decontamination	Structures affected by blast, up to 0.5 square mile of contamination	Evacuation of 100,000 downwind will be required after plume has passed, a localized area will need to be relocated until area is cleaned up.	Sheltering and/or evacuation of downwind populations will be required and must occur quickly; hospitals inundated by 50,000 "worried well"	Decontamination of injured persons prior to hospital admission; superficial decontamination needed for most; short- and long-term followup for injured							
12	Explosives Attack - Bombing Using Improvised Explosive Devices	Improvised explosive devices (IEDs) to detonate bombs at a sports arena, parking lot, and underground transportation. More IEDs detonated in the lobby of the nearest hospital emergency room (ER).	100 fatalities; 450 hospitalizations	Structures affected by blast and fire	Evacuation of immediate area around each explosion results in approximately 5,000 people seeking shelter in safe areas.	Evacuation is required as well as additional threat assessment; area must be cordoned	Injuries range from "walking wounded" to multiple systems trauma, burns, some fatalities; potential loss facilities at target hospital will require other facilities to receive all patients from blast sites							
13	Biological Attack - Food Contamination	Ground beef is tainted in California with an agent, following retail distribution, the tainted ground beef is in three cities.	500 fatalities; 650 hospitalizations; 1,800 illnesses	None	None	Not Applicable	Victim care will require diagnosis and treatment of affected population and distribution of prophylaxis for potentially exposed populations							

Scenario Number	Scenario Title	Scenario Description	Executive Summary			Mission Areas Activated		Potential Health Call Center Response Capabilities						Community Response
			Casualties	Infrastructure Damage	Evacuations/Displaced Persons	Evacuation and Shelter	Victim Care	Health Information	Disease/ Injury Surveillance	Triage/ Decision Support	Quarantine and Isolation Support	Outpatient Drug Info/ Adverse Event Reporting	Mental Health Assistance/ Referral	Mass Risk Communication
14	Biological Attack - Foreign Animal Disease (Foot & Mouth)	Farm animals at specific locations are infected with hoof and mouth disease.	None	Huge loss of livestock	None	Not Applicable	It will be necessary to euthanize and dispose of infected and exposed animals; impact on farmers and farm communities should be considered							
15	Cyber Attack	In a cyber attack, credit-card processing facilities are hacked and numbers released to Internet, causing mass credit card cancellation, nationwide failure of ATMs; also payroll and pension malfunctions.	None	Cybernetworks	None	Not Applicable	Economic assurance							

Definitions for Potential Health Call Center Response Capabilities

Health Information	Providing disaster and/or disease information to the public during and after the crisis. This information is provided to the public and providers to support their ability to care for themselves and others.
Disease/Injury Surveillance	Collecting specific data or utilizing already established databases to identify disease/illness/injury, emerging health trends or sentinel events.
Triage/Decision Support	Utilizing clinical algorithms or decision trees to support the management of caller reported symptoms. There are varying levels of clinical decision support depending upon the scope of practice of the person answering the phone. This can also include non-clinicians providing information to callers to allow them to make their own healthcare decisions.
Quarantine and Isolation Support	Monitoring the compliance, health status and resource needs of those assigned to home quarantine and isolation. <u>Quarantine</u> applies to people who have been exposed to a contagious illness and may be infected but are not yet ill. Separating exposed people and restricting their movements is intended to stop the spread of that illness. Quarantine can be highly effective in protecting the public from disease. <u>Isolation</u> is the separation and restriction of movement of ill people to stop the spread of that illness to others. People in isolation may be cared for in their homes, in hospitals or at designated health care facilities.
Outpatient Drug Information/Adverse Event Reporting	Providing drug information including pill identification and collection of adverse drug events, especially needed with large-scale prophylaxis or immunization without standard medical supervision (i.e. Cities Readiness Initiative).
Mental Health Assistance/Referral	Recognizing individuals with mental health needs, providing referrals to community resources where appropriate and incorporating any post-event government agency directives (i.e. surveying community mental health status per CDC).
Mass Risk Communication	Utilizing general informational messages distributed by government and community leaders via the media (i.e. public service announcements, radio bulletins, television "crawlers", Emergency Alert System) to alert and inform the greatest number of the public.

Grading Scale for Scenarios and Health Call Center Response Capabilities

	Scenarios identified as most applicable for integration with health call center capabilities and that are specifically addressed in this task order.
	Capabilities that correspond best with the expertise of health call centers and the expected response needs of the community. These capabilities are addressed within this task order with proposed strategies, tools and models.
	Other capabilities that correspond with the expertise of health call centers and the expected response needs of the community.
	Capabilities that may exist in health call centers though there may not be a great response need in the community.
	Capabilities that health call centers would need to refer to more appropriate resources within the community.
	Primarily a community response capability that health call centers would need to integrate with.
	Capabilities that are not well-suited to expected community needs for this scenario.

Appendix 2. Potential Health Call Center Capabilities for Four National Planning Scenarios

1. Biological Attack-Aerosol Anthrax¹⁻³

Health Information Capabilities

- Recorded messages provide information on areas where attack has occurred, symptoms of inhalation anthrax, and incubation period.
- Inform the public about how inhalation anthrax is contracted and the low risk of contracting the illness from an infected person.
- Provide prophylaxis information for infected and non-infected individuals.
- Provide information about the course of the illness and the risk period for exposure in areas where attack has occurred.
- Provide information on the differences between inhalation, cutaneous, and gastrointestinal anthrax.

Disease/Injury Surveillance Capabilities

- Monitor number of calls reporting malaise, fever, cough, nausea, and vomiting. Other symptoms may include drenching sweats, dyspnea, chest pain, and headache.
- Document demographic information and place of travel for previous 7 days to help identify point of exposure.
- Identify suspicious cases and rule out influenza/pneumonia or other causes of related symptoms.
- Report data to local, State, and Federal health agencies as appropriate.

Triage/Decision Support Capabilities

- Identify symptoms and rule out influenza/pneumonia or other causes of related symptoms. Differentiation is best identified by lack of nasal congestions/runny nose as seen in influenza like illness (ILI) or bloody and watery sputum that is indicative of pneumonic plague. Symptoms of inhalation anthrax include:
 - Malaise
 - Vomiting
 - Dyspnea
 - Chest pain
 - Sore throat
 - Fever
 - Headache
 - Nausea
 - Sweats
 - Cough
- Recommend and/or refer for medical treatment cases with the above symptoms. Note: infection of inhalation anthrax cannot be ruled out if symptoms remit for a few days—in these instances it is important to encourage the caller to seek a medical evaluation and antibiotic therapy.
- Individuals who were in the area of the attack and are asymptomatic should be encouraged to seek medical attention for prophylactic treatment.

Quarantine/Isolation Support Capabilities

- There are no data suggesting patient-to-patient transmission of inhalational anthrax, so quarantine and isolation strategies are not likely to be needed.
- Consider monitoring people taking prophylaxis to determine if disease symptoms develop or if there are issues with drug therapy compliance.

Outpatient Drug Information/Adverse Event Reporting Capabilities

- Antibiotic therapy is necessary for individuals in high-risk groups who develop fever or evidence of systemic disease.
- Doxycycline, penicillin, and ciprofloxacin are the preferred antibiotics for the treatment of inhalation anthrax. It has been recommended by the CDC that a combination of two or three antibiotics may be necessary in persons with inhalation anthrax, giving the individual a greater chance of survival.
- Monitor for the possibility of allergic type reactions to antibiotics and encourage individuals to seek medical treatment prior to stopping therapy. Other complaints by individuals undergoing antibiotic therapy may include gastrointestinal tract intolerance.
- Antibiotic therapy is suggested to last 60 days, however spores may remain latent following discontinuation and patients should be instructed to report any flu-like symptoms immediately.
- Collect and report all adverse events to the local and State health departments and the FDA, as applicable.

Mental Health Assistance/Referral Capabilities

- Provide support for individuals who are taking prophylaxis.
- Help individuals cope with escalating fear, anxiety, and grief.
- Help infected groups or individuals deal with stigmatization and/or discrimination when perceived as a source of contagion.

2. Biological Disease Outbreak-Pandemic Influenza³⁻¹⁰

Health Information Capabilities

- Recorded message provides information on infection control measures such as hand hygiene and contact precautions.
- Provide information on general symptoms of ILI and factors that may contribute to the development of a novel influenza virus.
- Inform about populations at increased risk for contracting ILI, symptoms that may or may not be present in young children or the elderly, nature and severity of influenza outbreak, and indications of either seasonal or novel virus.

- Inform individuals with ILI symptoms to remain at home and separated from family members for 5 days after symptoms remit.
- Provide vaccination and antiviral information and locations.

Disease/Injury Surveillance Capabilities

- Monitor number of calls reporting ILI symptoms and their demographic information.
- Collect travel, occupation, and personal contact information of individuals reporting ILI to determine the potential for a novel influenza outbreak. Important questions should include:
 - Travel to areas affected by avian influenza viruses in poultry
 - Direct contact with poultry
 - Close contact with persons suspected or confirmed novel influenza virus
 - Occupational exposure to novel influenza via agriculture, health care, or laboratories
- Conduct data collection including:
 - Number of contacts that the infected individual has had
 - Relationship of contact
 - Nature of time in contact
 - Whether contacts were vaccinated or on antiviral medications
 - Number of contacts that have become ill or have been ill
 - Number of days between symptom onset and reporting
- Report data to local, State, and Federal health agencies as appropriate.

Triage/Decision Support Capabilities

- Identify symptoms, number of days with symptoms, and possibility of novel influenza outbreak. (Incubation time for seasonal influenza is generally 1 to 4 days. Incubation time for novel influenza is unknown; however, conservative estimates indicate 10 days between time of exposure and symptoms.)
- Individuals with symptoms who have indicated possible exposure to novel influenza virus (e.g. infected poultry, travel to areas affected by avian influenza, contact with individuals infected with novel influenza, or occupational exposure) should be directed to seek medical treatment.
- Identify early signs and symptoms of influenza that suggest need for medical evaluation:

- Rhinorrhea	- Conjunctivitis	- Chills
- Rigors	- Myalgia	- Headache
- Diarrhea		
- Identify individuals with underlying chronic illnesses that may or may not have symptoms indicative to ILI (such individuals may or may not have a fever and children may often present with GI symptoms such as vomiting and/or diarrhea).

- Advise individuals to self-monitor and, if symptoms occur or become worse, to contact hotline for further treatment guidance.
- Direct infected individuals to the appropriate level of care based on symptoms and potential contacts.
- Minimize the number of individuals seeking treatment at hospitals or clinics that are overwhelmed, and limit contact between infected and non-infected individuals.

Quarantine/Isolation Support Capabilities

- Assess progression or regression of symptoms, and identify needs of quarantined and isolated individuals.
- Facilitate and help with early detection of symptoms in individuals who are quarantined, limiting the time between symptom onset and isolation.
- Provide passive and active monitoring to quarantined or isolated individuals based on symptom level.
- Daily phone contact between hotline and quarantined/isolated individual for symptom evaluation.
- Assess the need for direct medical attention.

Outpatient Drug Information/Adverse Event Reporting Capabilities

- Antiviral treatment may be necessary for individuals infected with novel influenza, persons they have been in contact with, and persons considered high-risk (post-exposure prophylaxis may last for 10 days).
- Antiviral medication indicated for novel influenza include:
 - Amantadine
 - Rimantadine
 - Oseltamivir
 - Zanamivir
- There is a greater possibility of antiviral resistance with amantadine and rimantadine (both are better suited for pre-exposure prophylaxis). Side effects of these antiviral medications can include:
 - Central Nervous System (CNS): nervousness, anxiety, insomnia, difficulty concentrating, lightheadedness and potentially delirium, hallucinations, agitation, and seizures in severe instances.
 - Gastrointestinal (GI) System: nausea and anorexia
- Both oseltamivir and zanamivir are more effective and lack antiviral resistance, as well as have fewer side effects:
 - Oseltamivir can have GI side effects
 - Zanamivir can cause bronchospasm and is contraindicated in individuals with underlying chronic respiratory disease
- Oseltamivir and influenza vaccine can be administered concurrently.
- Collect and report all adverse events to the local and State health departments and the FDA, as applicable.

Mental Health Assistance/Referral Capabilities

- Provide support for quarantined/isolated individuals.
- Help individuals cope with escalating fear, anxiety, and grief.
- Help infected groups or individuals deal with stigmatization and/or discrimination when perceived as a source of contagion.

3. Biological Attack-Plague^{11,12}

Health Information Capabilities

- Recorded messages provide information on areas where attack has occurred, symptoms of pneumonic plague, incubation period, and contact precautions.
- Provide prophylaxis information for infected and non-infected individuals. Asymptomatic individuals at risk for developing illness include:
 - Household members of infected individuals
 - Health care and laboratory workers
 - First responders
 - Patient transporters
 - Coworkers
 - Friends
- Provide information about the course of the illness and the risk period for exposure in areas where attack has occurred.
- Provide information on the differences between bubonic and pneumonic plague.

Disease/Injury Surveillance Capabilities

- Monitor number of calls reporting fever, cough, dyspnea, bloody or watery sputum, or rapidly progressing symptoms of pneumonia or bronchopneumonia.
- Document demographic information and place of travel or contact for the past 6 days (important to note locations to identify if endemic exposure is possible).
- Identify suspicious cases, and work to rule out influenza or inhalation anthrax.
- Monitor for reports of illness in areas not known to have enzootic infections.
- Report data to local, State, and Federal health agencies as appropriate.

Triage/Decision Support Capabilities

- Identify symptoms, and rule out influenza or inhalation anthrax. Differentiation is best identified by bloody and watery sputum in individuals with pneumonic plague. Other symptoms include fever, weakness, rapidly developing pneumonia with shortness of breath, chest pain, cough, sometimes bloody and watery sputum, nausea, vomiting, and abdominal pain.

- Recommend medical treatment in all cases with the above symptoms, especially those who have been in contact with infected individuals or in the area of the attack over the past 6 days.
- Identify individuals who have been in contact with infected persons who currently do not have symptoms, and recommend prophylaxis treatment.
- Provide information to reduce contact precautions.

Quarantine/Isolation Support Capabilities

- Assess symptoms of individuals who are being treated for pneumonic plague for progression or regression of symptoms such as with daily phone contact.
- Assess symptoms of individuals who are being treated with antibiotics and are asymptomatic to identify development of symptoms.
- Monitor quarantined and isolated individuals until they have received at least 48 hours of antibiotic treatment and they have shown clinical improvement.
- Assess the need for direct medical attention.

Outpatient Drug Information/Adverse Event Reporting Capabilities

- Antibiotic treatment should begin within 24 hours of the first symptoms.
- Doxycycline and ciprofloxacin are available in the oral form, and streptomycin and gentamicin are available intravenously.
- There is a possibility of allergic type reactions to these antibiotics, in which case the person should seek medical treatment prior to stopping therapy.
- Other complaints by individuals undergoing antibiotic therapy may include gastrointestinal tract intolerance.
- Collect and report all adverse events to the local and State health departments and the FDA, as applicable.

Mental Health Assistance/Referral Capabilities

- Provide support for quarantined/isolated individuals.
- Help individuals cope with escalating fear, anxiety, and grief.
- Help infected groups or individuals deal with stigmatization and/or discrimination when perceived as a source of contagion.

4. Biological Attack-Food Contamination¹³

Health Information Capabilities

- Recorded messages provide information on food contamination and its potential source, as well as symptoms that may develop.
- Provide prophylaxis or treatment information if available.

Disease/Injury Surveillance Capabilities

- Monitor number of calls reporting unusual symptoms, and document locations where the individuals have eaten.
- Document and classify symptoms in order to better identify the type of agent.
- Help to develop strategies for diagnosis based on symptoms.
- Report data to local, State, and Federal health agencies as appropriate.

Triage/Decision Support Capabilities

- Identify symptoms and use diagnostic strategies to determine the nature of the illness.
- Make recommendations and/or referrals for medical treatment.
- Depending on the type of agent, advise individuals to self-monitor and, if symptoms occur or become worse, to contact hotline for further treatment guidance.

Quarantine/Isolation Support Capabilities

- Depending on the agent, quarantine or isolation may be necessary; however, most agents do not pose a threat of infection through person-to-person contact.

Outpatient Drug Information/Adverse Event Reporting Capabilities

- Medical treatment will vary based on the agent used in the attack.
- Collect and report all adverse events to the local and State health departments and the FDA, as applicable.

Mental Health Assistance/Referral Capabilities

- Provide support for quarantined/isolated individuals.
- Help individuals cope with escalating fear, anxiety, and grief.
- Help infected groups or individuals deal with stigmatization and/or discrimination when they are perceived as a source of contagion.

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Appendix 3. Suggested Elements for Public Health Information and Decision Support Hotlines: The Health Emergency Line for the Public (HELP) Model

Contents

Introduction	85
Goals and Lessons Learned	86
Elements of a Telephone Information and Decision Support System.....	88
Call Handling Requirements and Support Services	88
Service Levels.....	89
Service Users	90
Multipurpose/Multifunction Support Services	91
Use of Recordings and Other Information Resources.....	93
Use of Call Center Technology	94
Information Topics and Content.....	94
Staff Training and Quality Control.....	95
Data Collection and Reporting.....	97
Adaptability and Utility	98

Appendixes

Appendix 3-A. Sample FAQ from West Nile Virus Library.....	100
Appendix 3-B. Sample Report Items and Data Graphs.....	101

Introduction

The Rocky Mountain Regional Health Emergency Line for the Public (HELP) program provides a model for disseminating and collecting information in health emergencies. In our experience, the basic call center infrastructure and elements of HELP are needed to support the tools described in this report. This appendix describes those HELP elements so that similar capabilities can be developed within existing community health call centers to support outpatient health care and monitoring during public health emergencies. A more complete discussion of the requirements for call center infrastructure (people, processes, and technology) can be found in the Health Emergency Assistance Line and Triage Hub (HEALTH) model report on the Agency for Healthcare Research and Quality Web site (www.ahrq.gov/research/health/).

Goals and Lessons Learned

The HELP program objectives, which we developed with our public health partners include:

- Developing a standardized and prepared response to public health events.
- Providing consistent, accurate information.
- Collecting and maintaining structured data to better characterize events and responses.
- Developing capability and capacity to adapt to other public health emergencies.

Essential components for a standardized and prepared response include:

- Call handling procedures.
- Call center infrastructure/technology.
- Toll-free lines with up-to-date recordings.
- Integrated Web site.
- Trained information providers.
- Defined referral procedures.
- Consistent, accurate information delivery.
- Structured data collection and reporting.

In our experience with operating health/medical call centers and responding to health emergency events, we learned a number of valuable lessons:

- Structured upfront planning is essential.
- All call center staff should have a basic understanding of the flow of information.
- Systems need to be flexible to:
 - Meet any challenges or unexpected questions and requests for information,
 - Update/change the information provided as new data becomes available,
 - Adapt to unpredictable and changing call volumes,

- Provide additional trained staff when call volumes increase.
- A formal and timely communications process must be in place that includes constant reviews and revisions of the information so that only the most current and correct information is provided to callers.

The last lesson relates to quality control mechanisms that will ensure the success and continual improvement of hotline services, as well as provide the call center with the capability to provide specialized information customized to the health event.

In planning for future events, it is clear that data collection must be sensitive so that it can:

- Identify special populations and capture the needs of those populations.
- Be flexible enough to address those needs.

Summary: Call centers are a valuable resource in providing consistent and accurate information not only to the general public but also to health care providers, as well as between health care providers and health departments. The goal is to develop a program that can provide much-needed support for those affected, those with concerns (worried well), and those professionals managing the incident.

Elements of a Telephone Information and Decision Support System

Call Handling Requirements and Support Services

Authorization and Liability

Call flow processes, scripting, and the prepared responses to frequently asked questions (FAQs) should be approved by the appropriate agency (i.e. public health department) or other client. These must be carefully followed during call delivery. Adding unapproved information or personal opinions creates liability for the persons delivering the service, for the contact center itself, and for the client agency.

If call center personnel (licensed professionals or information providers) have a process-related concern arising from the scripts or decision trees when speaking to a caller, they are to contact supervisors immediately. If the information specialist or clinician handling a call has any concern or is uncomfortable with how the call resolved, they should report the call identification number, date and time of the call, person handling call, and situation/concerns to a supervisor or to quality assurance personnel.

Security, Confidentiality, and Compliance

All caller information should be treated as confidential and shared only with call center and client agency employees for whom it is appropriate. It should be determined whether it is necessary to comply with any provisions of the Health Insurance Portability and Accountability Act (HIPPA). If the client agency is a public health entity, or if the call center is involved in responding to a community emergency, there may be exemptions from HIPPA (www.cdc.gov/od/science/regs/privacy/index.htm).

To safeguard patient health information and confidentiality, do not send e-mails or online reports that contain caller identification information unless the content is encrypted. Also consider collecting non-sensitive information. For example, collecting only a caller's zip code and county reduces the amount of information to collect and thereby shortens call times, while still allowing staff to answer questions, supply information, and report situational awareness information to the state health department (i.e. the top information requests by county). This minimal information approach also reduces any potential barriers for callers who may not feel comfortable providing names, addresses, phone numbers, and other identifying information.

However, callers may be comfortable supplying additional identifying information, depending on the situation. If a caller's questions cannot be addressed immediately (for example, the information is not available and a response request must be e-mailed to a State epidemiologist) callers can be given the option to supply contact information so they could be called back with a response. Also, if they were reporting an incident, such as a dead bird during a West Nile Virus outbreak, they might supply location information (at least cross streets) to allow for geo-coding of data.

Summary

It is important to determine what the data needs are for either providing information to or collecting information from the public to allow for adequate disease outbreak management and situational awareness for the specific incident being addressed.

Service Levels

A two-level service system was developed to respond to the needs of different clients and incidents. Level 1 involves only basic information collection and dissemination, while Level 2 involves more advanced clinical triage or decision support. We have developed our platform to provide Level 1 service and use information providers only (unlicensed staff). We have the capability to expand to Level 2 service if the client or incident requires by bringing in clinical staff. However, in many incidents there may be a lack of clinical professionals available to handle calls; therefore, we chose to concentrate on Level 1 service that information providers can deliver.

1. Level 1 Service

- Recorded information on current event status
- Information Providers give approved content through FAQ's
- Data collection as required by client
- Reporting and data analysis as required by client

Delivery Method

- Telephone
- Web site
- Information Providers

2. Level 2 Service

- Recorded information on current event status
- Information Providers give approved content through FAQ's
- Decision support for public with suspected related symptoms*
- Decision support for providers treating public*

Delivery Method

- Telephone
- Web site
- Information Providers
- Registered Nurses*

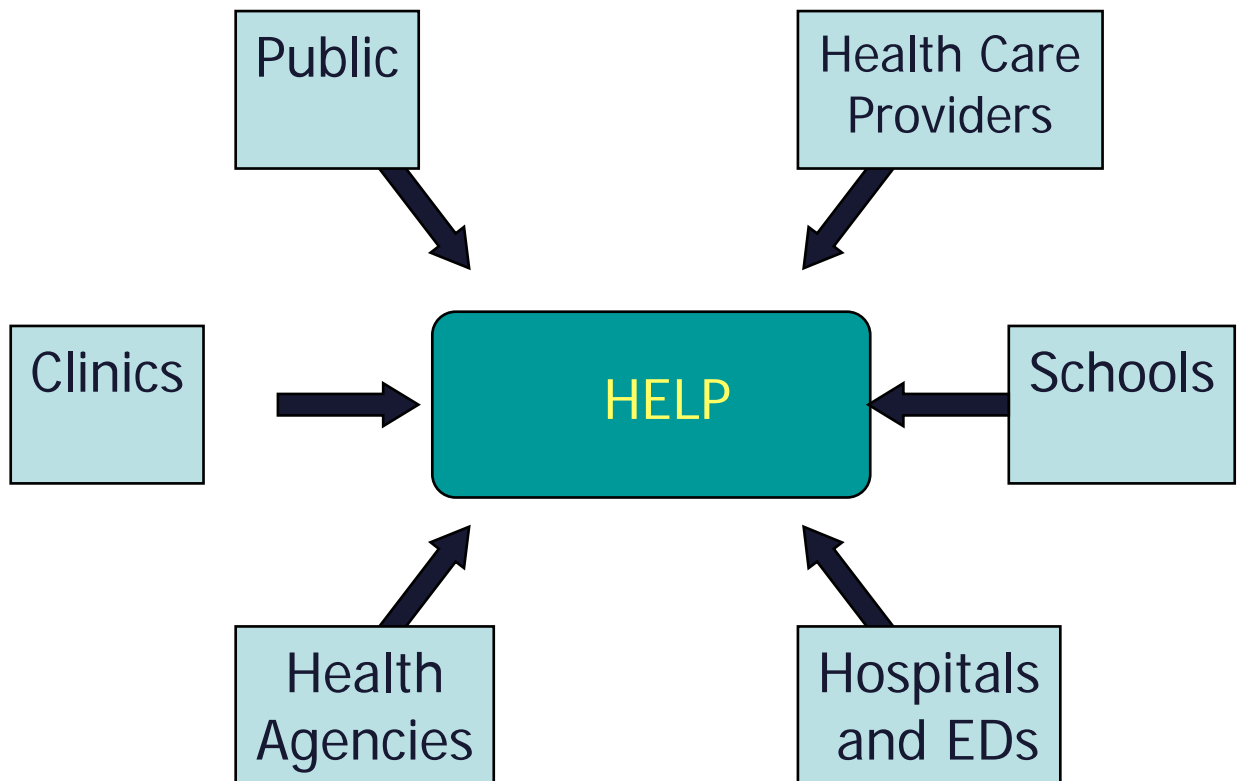
* Level 2 that includes clinicians such as nurses providing decision support for the public and providers will require pre-designed protocols/clinical decision trees specific to the event.

Summary

Planners should first determine the type of service level that they intend to provide and then staff appropriately. It is then important to establish the precise services that are needed before developing the support systems and procedures for them to properly function.

Service Users

It is helpful to determine the expected potential service users and to begin to forecast what their needs may be. Though we intended to provide services to primarily the general public, we found there were many other service users that we had not anticipated, and we had to develop resources in order to meet their needs. The following figure demonstrates the different user groups we have identified from operating the HELP program.

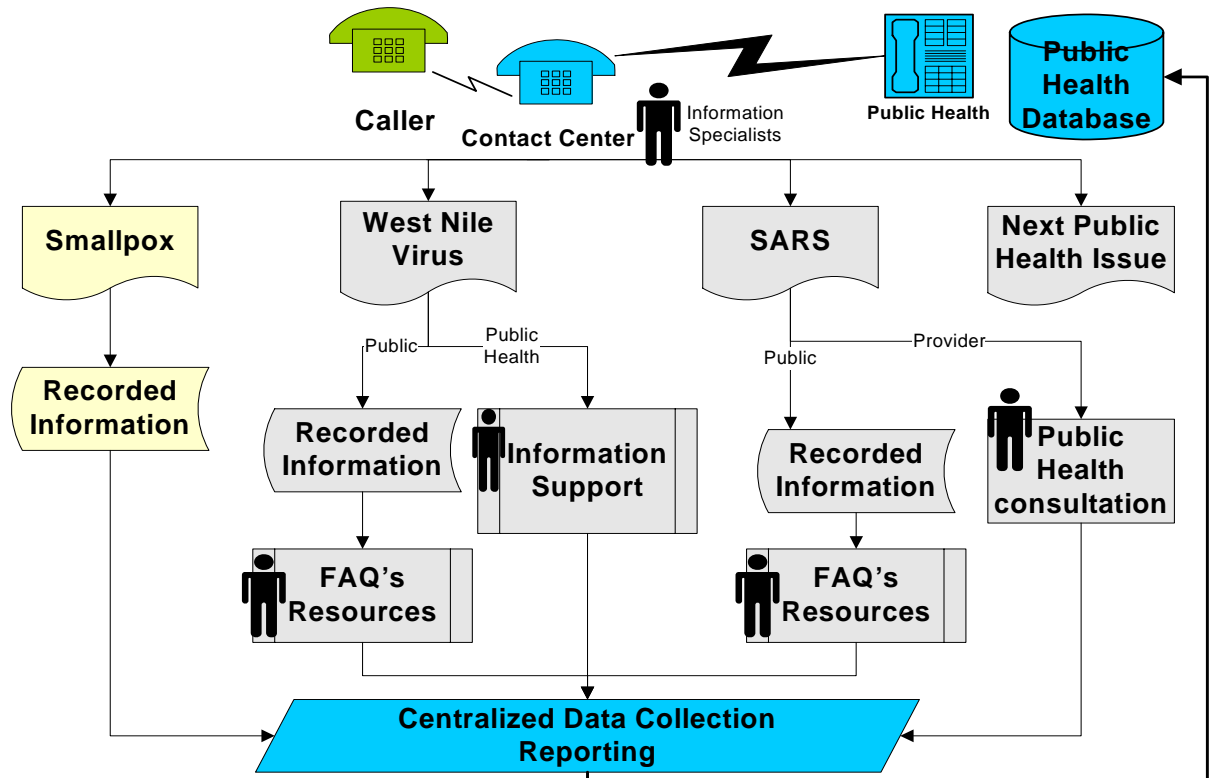


Summary

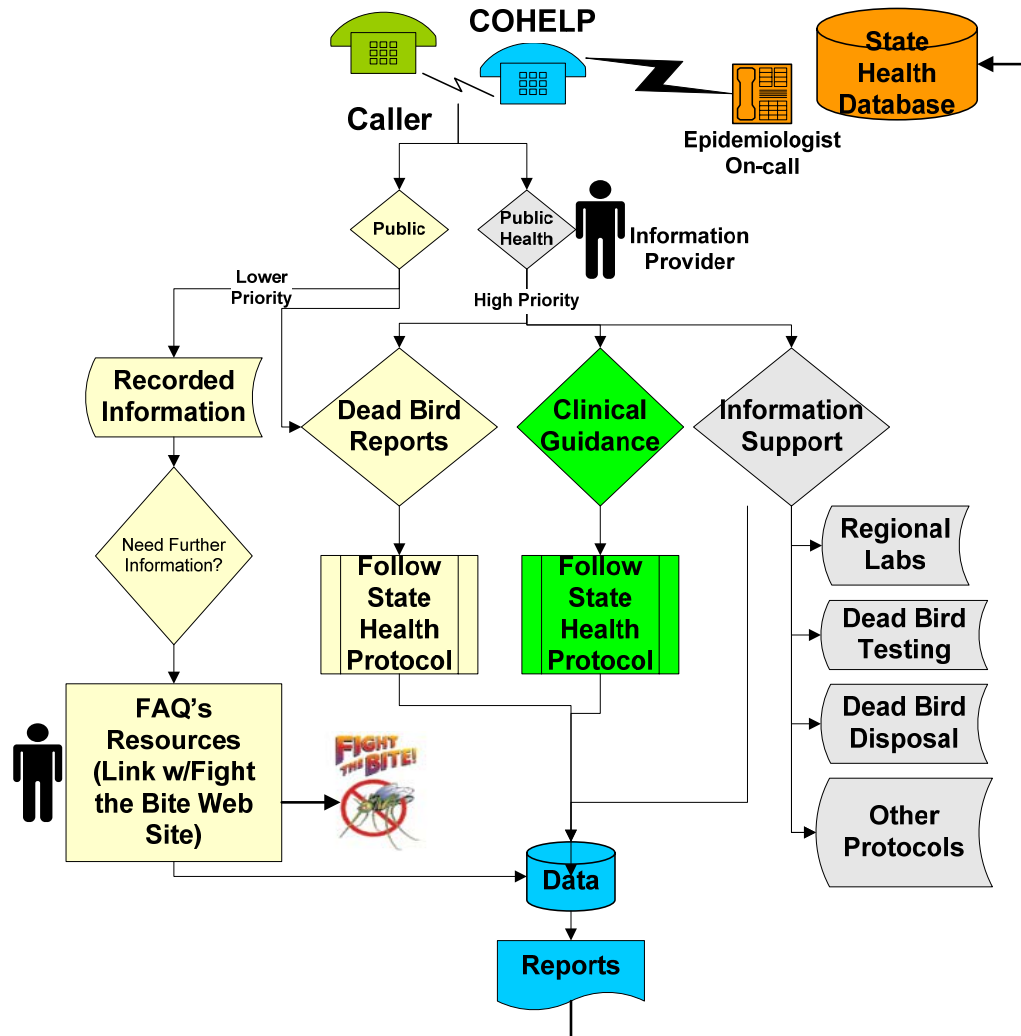
Planning for specific user groups will help in the development of appropriate resources and information; however, planners should be prepared to adapt services to new user groups as situations require.

Multipurpose/Multifunction Support Services

It is also important to know the scope of the services that the call center will provide. A hotline can be constructed that addresses only a single topic/incident or one that could handle multiple topics. It may be best to begin providing services for a few topic areas and then to gradually increase topic areas over time (see figure below for an example of expanded services).



An example of a more detailed call handling flow for West Nile Virus calls is shown below. The expected needs for both the public and public health professionals were accounted for and appropriate information resources or referrals were put in place.



Summary

A single hotline can be configured to provide information and support for a variety of events. It may be better to establish one emergency hotline that can be customized to various events and gain support from the public and health care professionals than to try to promote a new hotline for every new event.

Use of Recordings and Other Information Resources

Once service levels, scope of services, service providers, and call flows are determined, it becomes important to consider ways to help handle anticipated call volumes. In non-emergency events it may be easy to have staff answer every call. However, in any type of health event that generates some public concern, call volumes may rapidly increase, especially if media organizations become engaged; it becomes difficult to staff so that every call is answered and there are no call queues.

Up-front messages can provide the most requested information of the day to satisfy the greatest number of callers with a fixed complement of staff. Be careful to keep the length of upfront messages acceptable to callers (generally no more than 1 minute), or they get frustrated with the inability to speak to someone in a timely manner.

We have tracked call times to make sure that the majority of callers do listen to messages and then hang up (indicating to us that they received answers to their questions) instead of waiting in queue (indicating they still have unanswered questions). For those that opt to remain in queue, we cycle other frequently requested information after 1 minute to try to answer their questions before reaching the staff. That ensures that the staff is really assisting those who could not be helped easily by other means. Callers also can be referred to other information sources (such as the Internet) that they may opt to explore instead of waiting in queue or to investigate first before calling back. It is important that Web addresses are easy for the caller to jot down from the message (i.e. www.cohelp.us). Internet resources with more complicated addresses can then be accessed from the supplied Web address via links. This avoids difficulty with trying to capture complex Web addresses (i.e. www.cdphe.state.co.us/dc/Influenza/index.html).

Messages and recordings provide many advantages:

- Insure consistent, accurate information delivery on every call.
- Deliver the most urgent public health messages.
- Allow for customized messages to address most frequent concerns and issues.
- Reduce the need to speak with a staff person.
- Assist with call volume surges.
- Direct callers to Internet resources for information.

Summary

Remember that every call that can be handled by a recorded message or referred to the Internet reduces the need for staffing during peak call volumes.

Use of Call Center Technology

Call center technology can improve call handling efficiency and assist with call volume surges. Examples of such technology are:

- Automatic Call Distribution (ACD) functionality, which insures that calls are evenly distributed among available call handling staff and reduces any delays in answering calls.
- Call management software, which can be used to monitor call length times, queues and wait times, abandonment rates, and other call metrics (these metrics are important for both understanding what callers are experiencing and to help manage staff in the call center).
- Interactive Response (IR) technology to allow callers to access information using their touch tone phones or even voice commands and thereby increase their ability to self-service their needs. This is used extensively in banking and airline industries. Examples of four such applications that we have developed for addressing anticipated needs in certain public health emergencies are detailed in Appendix 4, Developing an Interactive Response Tool.

Summary

In operating a call center, it is important to consider available technology for increasing call handling efficiencies and understanding call metrics.

Information Topics and Content

It is important to determine the specific topic areas on which information will be provided. We have worked in partnership with public health agencies to determine these topic areas and have required that an epidemiologist approve all information content before using it. This helps to ensure consistency with broader public health response messages and efforts. Topic areas could include:

- | | |
|----------------------|---------------|
| -Smallpox | -Ricin |
| -West Nile Virus | -Mold |
| -Influenza/Pneumonia | -Avian Flu |
| -Anthrax | -White Powder |
| -Tuberculosis | -SARS |
| -Hantavirus | |

Besides determining the topics, it is also important to determine the information subtypes to be offered, such as:

- General information.
- Public health messages (personal/family protection, health department messages and points of contact).
- Provider guidelines and treatment information.

The process of determining these subtypes helps anticipate specific questions for which the public may need answers. Developing information resources in the format of FAQs and their answers works very well (see Appendix 3-A at the end of this appendix for an example). The FAQs can be assigned key words so they can be quickly referenced during a call. We have also found that having a process for “Information Not Available” is important. For such calls it is important to have a notification protocol to alert the appropriate health department contact so they can evaluate whether a FAQ or other resource is needed with the expectation of an answer within 72 hours.

Referral protocols can also be important information resources. Since the HELP program is staffed with information providers, they are instructed to refer callers with certain health issues to other resources: callers requiring symptom management are referred to their health care provider or a nurse advice line, and callers reporting a potentially toxic exposure are referred to a poison control center.

Summary

Determine information topics to be addressed and then what information content is needed. Consider having all content approved first by appropriate public health agencies. Be prepared to add additional information as the situation and need dictates. Develop the appropriate referral protocols to direct callers to other resources, as needed.

Staff Training and Quality Control

It is important to provide call center staff with the appropriate tools and training for them to deliver the expected service level. The skill profile for staff depends on the actual level of service they are required to provide and may also depend on the nature of the event.

In our experience, Level 1 service can be provided with Information Providers (those with some familiarity of health concepts, such as teachers, paramedics, veterinary technicians, medical/nursing students). Level 2 service would require licensed clinicians (such as nurses, pharmacists, physicians), who would be expected to provide health care assessment and advice.

We suggest developing a standardized training program for staff that includes the following three components:

- **Customer service/communication skills**—to prepare staff for answering calls from people who have different abilities for processing information, a range of emotions regarding health concerns, and special needs (such as translation services for non-English speakers and TDD/TTY services for the hearing impaired). Important skills to teach are active listening to help callers identify their specific concerns while demonstrating empathy and respect. Crisis listening skills may be needed to help staff identify callers with signs of mental distress who could benefit from counseling resources and referrals.
- **Technology skills**—to teach staff to operate telephones and information management software. Utilizing software that guides staff through a call in a standardized manner, prompting them for required information, will help to simplify training in this area.
- **Content education**—to prepare staff to provide the appropriate information in a conversational manner and at a level that the caller can comprehend. Requiring staff to first listen to live calls and to have them role play as callers can help their training.

We developed a training program that includes 3 hours of didactic and 3 hours of practical call handling for all new personnel. The 6-hour time frame seemed reasonable for circumstances that would require a quick staffing ramp up to address an emergency. We have pre-trained certain individuals (such as existing administrative personnel) and provided them limited call handling experience to give us a resource for potential surges in call volume. We have also had staff attend Web casts and in-person trainings related to specific health topics for their continued training. Affording staff the opportunity to promote the HELP program to the public and professional groups at conferences has resulted in increased staff satisfaction.

It is important to have active quality assurance/quality control (QA/QC) procedures in place both to monitor the services being provided and to provide feedback to staff. Such procedures can help to quickly identify if calls are not being handled properly and staff need further training. QA/QC procedures can include recorded call reviews (or “listening in” to live calls), peer review of call documentation, and mechanisms for staff to provide feedback and suggest improvements.

Summary

Develop a staff training program that is consistent with expectations for service delivery and can be used to accommodate staffing ramp ups related to emergencies. Training should include components for communication skills, technology skills, and content education. An active QA/QC program helps to assure consistent service delivery and to provide staff feedback for ongoing improvement.

Data Collection and Reporting

As important as it is to provide information to the public and health care providers, it is equally important to provide data related to an event, including the most common concerns, the origin of calls, and the specific information that callers are reporting. This data can help in the overall management of a health emergency and may be useful to public health agencies. They may be used to create additional or clearer messages for public information campaigns through various media outlets or to better understand whether disease control measures are effective (i.e. situational awareness).

For call data to be useful, it must be collected in a structured manner and then be reported in a consistent and reliable manner. The first step is to choose a commercial software application that has the ability to accommodate data entry and management requirements, preferably in a structured manner that leads staff step-wise through call data collection. In our experience, important call data elements include but are not limited to:

- Call volumes (calls per hour, day, week).
- Number of callers who listened to recorded information only.
- Number of calls handled by a live agent.
- Calls abandoned (caller hung up without listening to recorded information).
- Caller demographics (zip code, county, city).
- Caller contact info (phone number or e-mail, if needed to provide followup).
- Call type (WNV, influenza, other topics).
- Call reason (information, report case, provider information).
- Health info provider (listing of FAQs used).
- Surveys (dead bird reports, vaccine adverse events reporting system).

Ideally, the software should be able to assist in information resource management (such as maintaining and quickly accessing FAQ libraries or State/local health department notification and referral protocols). As stated previously, we established an “Information Not Available” protocol which requires that the appropriate health department contact is notified and our software application accommodates this notification automatically.

The software should also be able to generate reports and export data files for transmission to the appropriate agencies or clients. An example of the components of reports generated for our public health partners include:

- Call metrics (call volume, call times, call disposition).
- Caller demographics (zip code, county, city).
- Call types (WNV, influenza and other topics).
- Information delivered (specific FAQs and counts of requests)..
- Customizations (“Information Not Available” requests, out-of-state calls).
- Surveillance signals (based on call center experiences).
 - Sentinel alerts (such as any “white powder” calls or health topics not covered).
 - Trends in public concerns (comparisons to previous reporting periods).

We have found it extremely useful to export and transmit survey data (such as dead bird reports or self-reported illness of influenza/pneumonia that can be geo-coded) to a recipient for conversion to maps for use in situational awareness and disease control strategies. A few sample data reports items and graphs from typical reports are presented in Appendix 3-B at the end of this appendix.

Summary

We do not endorse any specific software application but urge call centers to choose a solution that affords them the data entry, information resource management, and reporting capabilities they require. Agreed upon reporting schedules and processes should be developed with expected report recipients to ensure timely and useful information exchange.

Adaptability and Utility

In our experience, it has been valuable to have systems and processes that can be adjusted to the changing needs of emerging public health events. This has included the ability to:

- Rapidly change FAQ content and public health messages.
- Handle surge responses through a variety of mechanisms:
 - Use of recordings/announcements.

- Partnering with media to deliver information.
- Having trained ancillary staff.
- Learn from experiences.

Some of the lessons learned from more than 3 years of operating the HELP program include:

- Call volume is driven by the event and media attention—anticipate call volume surges related to morning, afternoon, and evening news broadcasts.
- Media organizations are willing to assist with disseminating information; for example, regularly including hotline numbers in television news crawlers.
- Adaptation to include the latest local and State health department messages are necessary to meet both public health and public needs.
- Surveillance, though not an intended purpose of the program, became an important function due to the utility of structured data collection (situational awareness) and ability to identify emerging issues (sentinel event detection).

Such partnerships between community health call centers and public health agencies prove that together we can meet the expected needs of communities during health emergencies, including: improving information support, improving surge capacity, expanding surveillance signals, and data collection for situational awareness. These partnerships help realize the new demands on public health agencies—increasing their response capabilities and access outside of the 9 a.m. to 5 p.m. work day, handling rapidly evolving information while maintaining control, and enabling the public to care for themselves and their families by supplying the information for them to make decisions.

Summary

The need for such partnerships will remain constant and potentially increase since public health events will continue to occur. These events will require effective, structured, and coordinated systems for providing public information and support as a component of a cost-effective, efficient, reliable, and adaptable response.

Appendix 3-A. Sample FAQ from West Nile Virus Library

Personal Protection (PPFAQ1): How can I protect myself from West Nile virus?

- ✓ The best way to protect you and your family is to limit mosquito exposure.
- ✓ Limit outside activity around dawn and dusk when mosquitoes feed.
- ✓ Wear protective clothing such as lightweight long pants and long sleeve shirts when outside.
- ✓ Apply insect repellent to exposed skin when outside. Repellents with DEET are effective but should be applied sparingly.
- ✓ Make sure that doors and windows have tight- fitting screens. Repair or replace screens that have tears or holes in them.
- ✓ Drain and prevent formation of all standing water. Stock permanent ponds or fountains with fish that eat mosquito larvae.
- ✓ Change water in birdbaths or wading pools and empty flowerpot saucers of standing water at least once a week.
- ✓ Remove items that could collect water such as old tires, buckets, empty cans, and food and beverage containers.

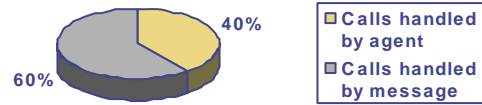
Appendix 3-B. Sample Report Items and Data Graphs

Total Calls = 36,361

Smallpox = 193

WNV = 12,555 (2,850 Dead Bird Reports)

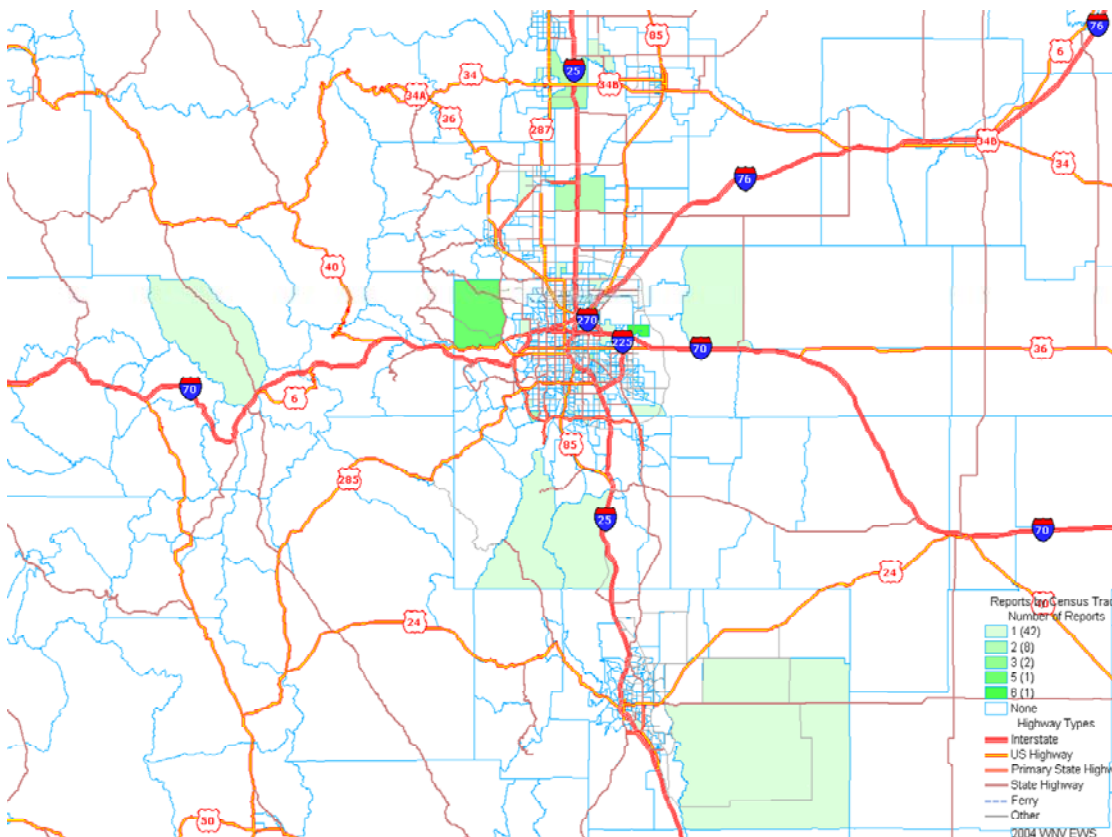
Influenza/Pneumonia/Mold = 23,613



Influenza Seasons Comparison

	2003 (10-01-03 to 02-28-04)	2004 (10-01-04 to 02-28-05)
Total Calls:	7110	7385
Top Call Types:	Information Call Possible Flu Health Professional	Information Call Health Professional State Health Dept Alert
Top 3 FAQs:	Where can my child get a flu shot? Where can I get a flu shot? What are the symptoms of the flu?	Where can I get a flu shot? Vaccine Shortage Statement What is FluMist?

Surveillance Map of Dead Bird Reports During West Nile Virus Outbreak - 2004



Appendix 4. Developing an Interactive Response Tool: The HELP Model

Contents

1.0	Introduction.....	107
1.1	Planning Phase.....	108
1.2	Analysis Phase.....	109
1.3	Design Phase.....	109
1.4	Implementation Phase.....	110
1.5	Evaluation Phase.....	111
2.0	Interactive Response Tool Planning Document.....	113
2.1	System Business Value.....	113
2.2	Goals.....	113
2.3	Roles and Responsibilities.....	114
2.4	Objectives.....	115
2.5	Feasibility Analysis.....	115
2.6	Resources and Timeline.....	116
3.0	Interactive Response Tool Business and Functional Requirements (Analysis) Document.....	117
3.1	Business Requirements.....	117
3.2	Functional Requirements.....	119
4.0	Interactive Response Tool Design Document.....	123
4.1	Quarantine/Isolation Monitoring Application.....	123
4.2	Drug Identification Application.....	129
4.3	Point of Dispensing Application.....	138
4.4	Frequently Asked Question (FAQ) Library Application.....	148
5.0	Interactive Response Tool Implementation Document.....	195
5.1	Testing.....	197
5.2	Training.....	197
5.3	Migration.....	198
5.4	Success Measures.....	198
6.0	Interactive Response Tool Evaluation Document.....	201
6.1	San Luis Valley Region Exercise.....	201
6.2	North Central Region Exercise.....	203
6.3	Evaluation Summary.....	210
6.4	Future Research.....	210

Appendixes

Appendix 4-A. Case/Contact Investigation Form.....	211
Appendix 4-B. QI Monitoring Call Log.....	213
Appendix 4-C. DI Evaluation Form.....	217
Appendix 4-D. POD Evaluation Form.....	219
Appendix 4-E. FAQ Library Evaluation Form.....	221

1.0 Introduction

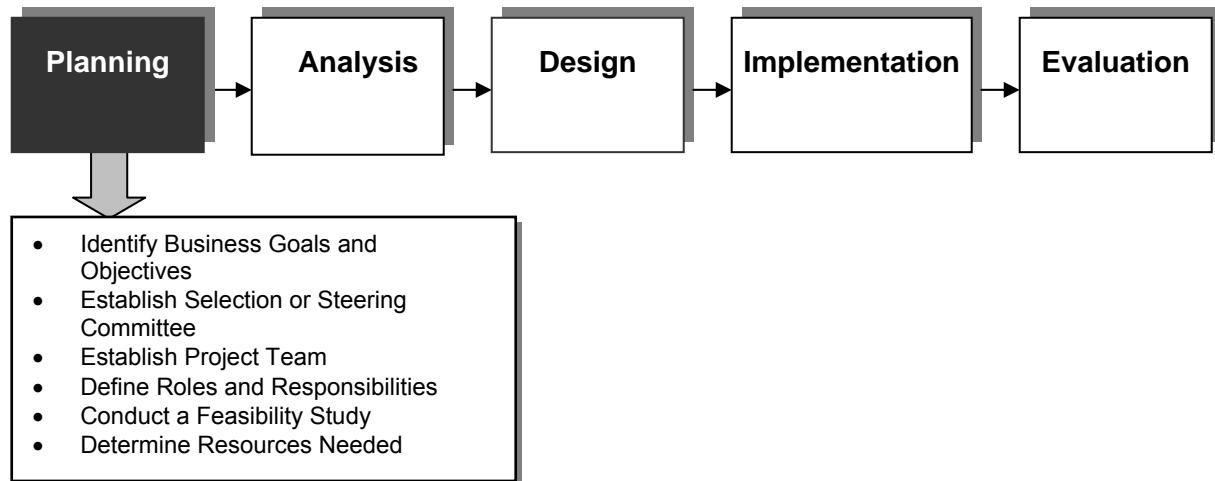
We used a project methodology-driven approach (illustrated in Figure 1) in developing this Interactive Response (IR) Tool. By adhering to best practices standards, this project methodology can save time, money, and resources by adhering to step-by-step processes from planning through evaluation to maximize benefit and minimize risk. Each phase of the project should result in documentation to adequately capture the knowledge exchange and most appropriate decisions.



Figure 1. Project Methodology Phases

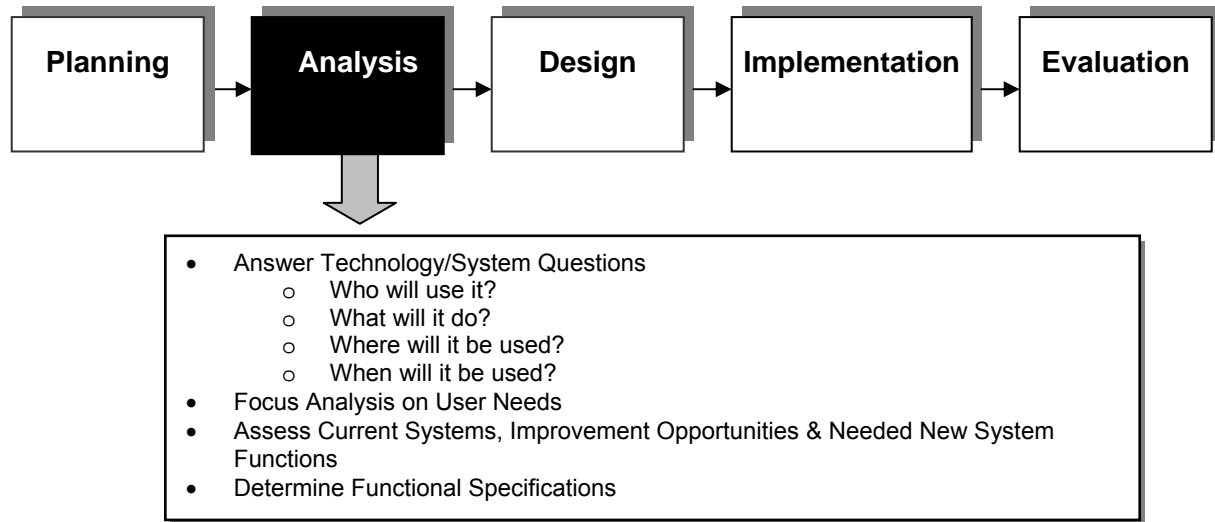
The following reviews the five phases and the strategies we employed in each to develop an IR solution for providing the most beneficial and efficient support for health call center services during public health emergencies. These IR solution requirements were largely formed from our call center experiences in responding to public health events and the types of services we anticipate being needed for responding to specific scenarios. This same project methodology can be utilized to replicate this IR solution and its applications within another call center environment, to adapt them to other scenarios, or to use similar applications with other technology or much reduced technology (such as developing call handling algorithms for use by call handling personnel). The importance of this tool and the IR solution described is to provide a framework for other health call centers to develop the needed capabilities for responding to events in their own communities.

1.1 Planning Phase



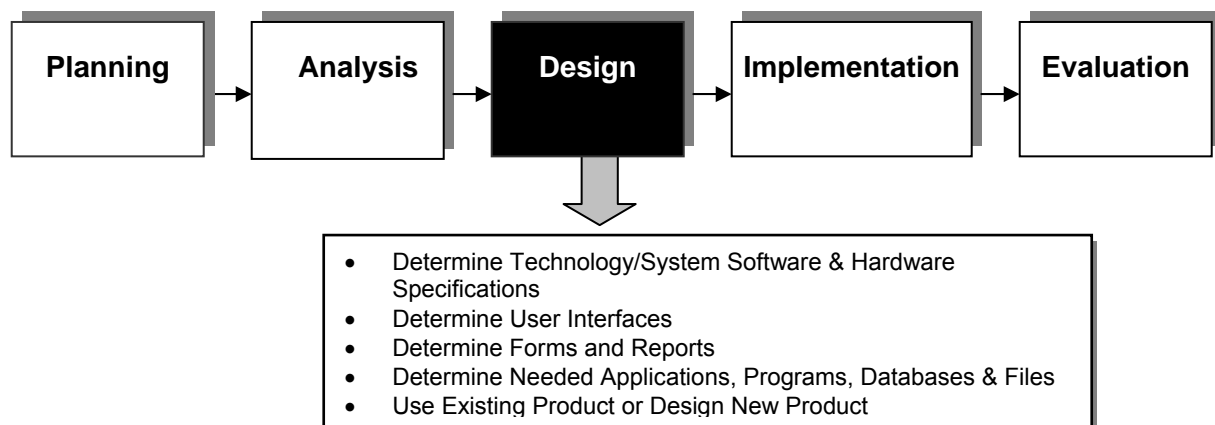
The planning phase identifies why a technology solution such as IR should be implemented and determines how the project team will implement it. During this phase, the system's business value to the organization is identified (e.g. improve care, lower costs, increase profits). The problem or goal is defined as well as how the technology can serve as a solution for the problem. The goal(s) for the solution should align with the organization's goals. A selection or steering committee is then established to represent the organization's decision-makers and key stakeholders. This group ultimately makes the selection decision and provides oversight for integration of the new technology into the organization. A project team is established and is responsible for understanding the technology, knowing of any associated restrictions on it, understanding the impact of any decisions on other technology within the organization, making decisions for the overall good of the application of the technology, and becoming the key resource for the application once implemented. The project team manages all aspects of the project through the planning, analysis, design, implementation, and evaluation phases. A feasibility study guides the selection of the system by determining the opportunities and limitations of the proposed technology, whether its applications will address the identified problems and if the organization should proceed. The feasibility study also identifies the objectives of the system, costs, benefits, value of the system, and the scope of the project. The expected deliverable from the planning phase is the Planning Document (see Section 2 beginning on page 113).

1.2 Analysis Phase



The analysis phase answers the questions of who will use the technology/system, what capabilities it will have, and where and when it will be used. The project team assesses the current systems, identifies improvement opportunities, and determines the functions that the new technology/system is to perform. The focus of this phase is on the users of the technology/system and their needs. The project team determines functional specifications through conducting interviews and/or gathering data from planners, operations staff and end-users. The expected deliverable from the analysis phase is the Business and Functional Requirements (Analysis) Document (see Section 3 beginning on page 117).

1.3 Design Phase



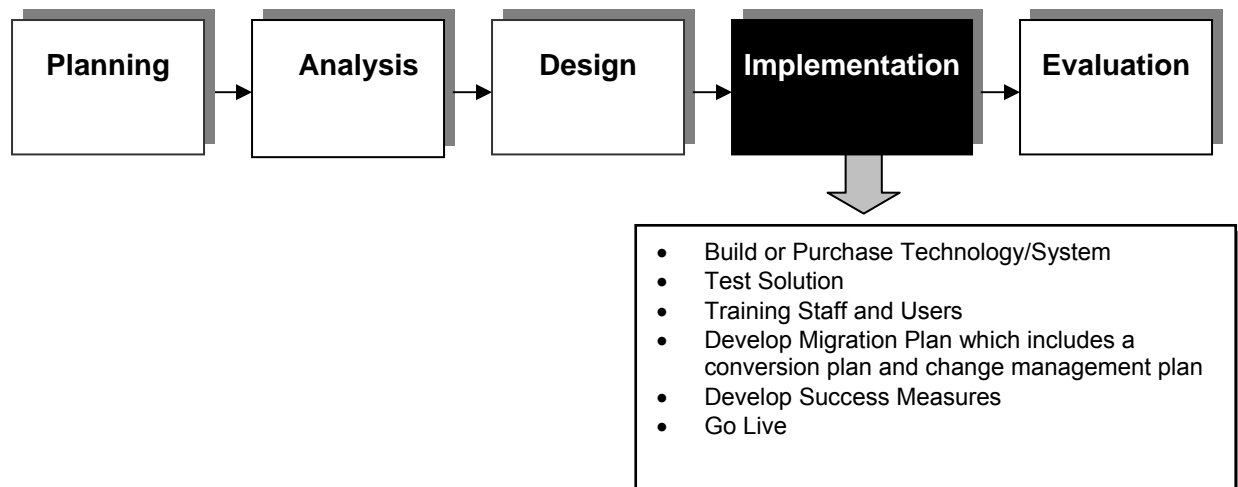
The design phase determines how the technology/system will operate in terms of hardware, software, and within any network infrastructure; user interfaces, forms and reports; and the applications, programs, databases, and files needed. During this phase it is determined whether the technology/system will accomplish the work through either selecting an existing product or designing

a new product. The expected deliverable from the design phase is the Design Document (see Section 4 beginning on page 123).

The Design Document contains four applications (inbound and outbound) that address specific capabilities that we determined would be needed during certain scenarios. These applications should increase efficiency and reduce personnel support for providing services to communities experiencing health emergencies:

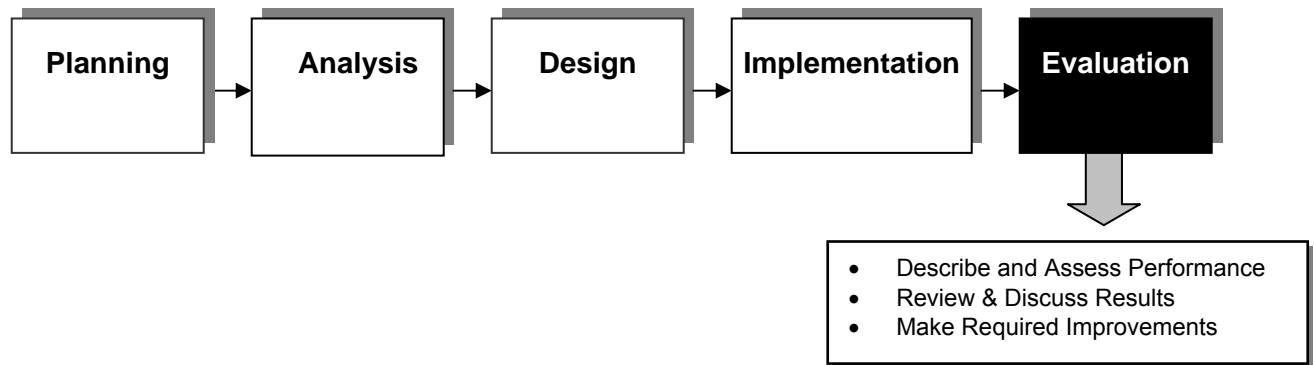
- Quarantine/Isolation (QI) Monitoring Application (outbound application).
- Drug Identification (DI) Application (inbound application).
- Point of Dispensing (POD) Application (inbound application).
- Frequently Asked Question (FAQ) Library Application (inbound application).

1.4 Implementation Phase



The implementation phase includes building or purchasing the technology/system, testing and piloting it, training staff, migration into an active environment, and then going live. During this phase, the technology solution undergoes comprehensive testing by first the project team and then other users. This allows for both coarse and fine-tuning to validate that the design meets the requirements and objectives. The overall implementation plan is developed and followed, appropriate users are included in the process, realistic time frames are established, and communication is highlighted. Depending on the environment of your call center, you may want to consider utilizing change management strategies and training to create a positive environment for learning and change among the staff impacted by the implementation. In addition, criteria for measuring success will be developed. The expected deliverable from the implementation phase is the Implementation Document (see Section 5 beginning on page 195).

1.5 Evaluation Phase



The evaluation phase describes and assesses the overall performance of the technology/system once it has been piloted and used. An evaluation methodology is developed and the results are disseminated, reviewed, and discussed so that the feedback can be utilized for technology/system improvements. The expected deliverable from the evaluation phase is the Evaluation Document (see Section 6, beginning on page 201).

The Evaluation Document contains our experiences with testing the QI Monitoring Application in two instances: 1) a rural community exercise with an early version of the application, and 2) an urban area exercise with a more developed version of the application. Both exercises contributed to improvements of the application so that it is ready for actual usage in an emergency.

2.0 Interactive Response Tool Planning Document

The Health Emergency Line for the Public (HELP) pilot program in Colorado, established by the Rocky Mountain Regional poison center to provide information during bioterrorism and other public health emergencies, provides a model for disseminating and collecting information in health emergencies in partnership with a State health department. While developing better strategies and means for managing call volume surges without sacrificing customer care, we identified the following capabilities:

- Respond to large influx of call volume during public health events.
- Assist quarantined persons during health emergency events.
- Assist health departments in distributing drugs in emergency events by providing the locations of dispensing centers.
- Have a fixed footprint within our call center preventing the need to expand our physical space in responding to increased call volumes.
- Increase our ability to respond rapidly to customer needs.
- Fit into our operating budget without excessive increases in technology costs prior to and during an emergency or disaster.

Our key objective was to develop a model that community health call centers could implement to support outpatient health care and monitoring in a major public health event.

2.1 System Business Value

Though the applications are intended for use during a disaster, we anticipate there will be ways to use the applications on a day-to-day basis. Any of the anticipated applications (drug identification, quarantine and isolation monitoring, etc.) could be adapted for non-emergency use. Because our center primarily provides services via the telephone, we are always looking for ways to be more efficient. Any way for us to more effectively and judiciously use personnel time, matching the right resource to the right need, is of benefit to our call center. Development of IR applications has the potential for freeing staff from information relating duties that could be automated (such as recordings of locations by entering zip codes) and allowing them to focus on tasks better suited to their training and expertise (such as assisting with clinical decision support of callers with health concerns).

2.2 Goals

Our goal was to develop, implement, and test a model to enable call centers (such as poison control centers, nurse advice lines, and other hotlines) to support home management/shelter-in-place approaches in certain mass casualty or health emergency events. We developed strategies, protocols, and algorithms to respond to specific scenarios. We believe that the resulting applications can help us

meet the goals of our mission without negatively affecting our customers. In order to both align with the organizational goals and achieve the desired business values, the solution must:

- Address the pertinent issues related to a public health event.
- Handle surges of call volumes without increasing our current physical facilities.
- Assist with delivering services without minimal increases in staffing (especially during a health pandemic event).
- Not adversely affect our customer service.

2.3 Roles and Responsibilities

A steering committee must be selected that represents the organization's decision-makers and key stakeholders. This committee ultimately makes the selection decisions and provides oversight for integration of the new technology into the organization. In order to make sure that the needs across our center were being met and that project merged with our existing technology, we chose the following responsibility areas to serve on the steering committee:

Contracts, Finance, Call Center Administrative Director, Research Director, Poison Center Program Manager, HELP Supervisor, Business Technology Manager, Information Systems (IS) Manager, Telecommunications Engineer, and Project Manager.

From this group a project team was selected (see list below) to manage all aspects of the project through the planning, analysis, design, implementation, and evaluation phases. Additionally, the project team had the following overall responsibilities:

- Understanding the technology being researched and any associated restrictions.
- Understanding the impact of any decisions on other technology within the organization.
- Making decisions for the overall good of the application of the technology.
- Becoming the key resource for the application of the technology once implemented.

Further specific responsibilities for each project team member are:

Research Director

- Principal Investigator—Has overall responsibility for seeing project through completion

Poison Center Program Manager

- Key stakeholder—Assures project can integrate with established operations and meets business needs

Business Technology Manager

- Key stakeholder—Coordinates telecommunication/information systems services support and provides input regarding telephone programming, call management, and reporting

Project Manager

- Assists Principal Investigator with managing all aspects of project, including coordination of pilot tests, documentation, and interface with technical staff

Telecommunications Engineer

- Coordinates information technology components of project, including vendor evaluation/selection process, ensuring the system conformation to our technology standards, testing and maintaining call routing, voice equipment, and related services

Information Systems (IS) Manager

- Primary contact for database and reporting support, ensures the system conforms to IS standards, coordinates IS support services

Outside Technology Vendor

- Understands the needs of the organization, its current infrastructure and resources, and provides a cost-effective technology solution with capability for modifications and refinements

2.4 Objectives

1. Implement IR solution applications within the budget and time table established.
2. Identify and evaluate four important public health event scenarios that will serve as examples for utilization of IR technology applications.
3. Identify the application requirements for each chosen scenario.
4. Identify all processes and procedures necessary to incorporate into applications.
5. Create call flow designs for the applications.
6. Develop the beta versions of the applications.
7. Create an implementation plan and testing strategies for the applications.
8. Pilot test applications in up to two exercises.
9. Review and evaluate testing results and modify applications accordingly.
10. Complete all documentation of application development and testing.
11. Provide health agencies with a tool that describes the process for developing and implementing an IR solution for managing needs of the public during health events, and provide guidance of how to utilize such a tool depending upon their available resources.

2.5 Feasibility Analysis

A feasibility analysis guides the selection of the technology/system by determining the opportunities and limitations of the proposed technology, whether its applications will address the identified problems, and if the organization should proceed. The feasibility analysis also identifies the objectives of the system, its costs, benefits and value, and the scope of the project. We used a categorical scale (poor, fair, good, excellent) to judge our Information Technology departments' familiarity with each of these feasibility components, as well as how well the system will ultimately be accepted by its users and incorporated into the ongoing operations of the organization with limited disruption.

2.6 Resources and Timeline

Human

Total project hours include exploring the problem, developing the applications, testing and refining the applications and then developing the tool for others to understand the process. Just application development or adaptation of the developed applications would take significantly less time.

Hardware

- Costs of hardware (for example, an IR system), if any.

Application Development and Administration

- Internal Information Technology (IT) Group—Administer new IR applications.
- External IR Consultant—Develop IR applications and train IT group in their operations.

Timeline for New Applications

The timeframes listed do not necessarily occur in series; many can be done concurrently while other milestones are in progress. There also may be delays between milestones due to other demands on the responsible person(s) and the resources they require to support them. The approximate times required for each of the five project phases are:

- Planning – 4 weeks
- Analysis – 2 weeks
- Design – 4 weeks
- Implementation – 34 weeks
- Evaluation (Modification) – 16 weeks

Note: In actuality, the evaluation phase including modifications begins during the implementation phase, continues through testing and is ongoing through operations based upon user experiences and feedback.

3.0 Interactive Response Tool Business and Functional Requirements (Analysis) Document

Based upon our understanding of our call center's interactive response (IR) technology, it has the ability to facilitate automated information dissemination and collection to callers using touch tone telephones. During a health emergency event it will likely be necessary to increase the ability to provide appropriate information to communities without the benefits of increased human resources. Therefore, we decided to explore the potential application of our IR system to assist us in responses to certain scenarios and the health needs we anticipate. We present this IR solution as a model that could efficiently and effectively handle surges related to certain public health emergencies, without compromising current medical information and triage advice services, for consideration.

The purpose of this section is to provide the business requirements and technical specifications for an IR solution and its applications as a model for other community health call centers. The information contained in this requirements document is an example of the steps that any call center would take to either replicate this IR solution within their technology environment or to adapt this solution for another purpose. This document should serve as a guide for determining the specific requirements and identifying key criteria to be applied towards the final design of an IR solution (hardware and/or applications). This document can also be used for determining specific requirements for non-technology solutions for the same capabilities within a call center (such as development of call handling procedures for call center staff to provide the information).

This document is intended for medical or public health community call centers and their technical personnel. This document could be useful for public health agencies that may want to develop such capabilities for responding to events and it could assist them in discussions with their community health call centers partners.

3.1 Business Requirements

Business requirements and benefits to be realized with the strategic deployment of the proposed IR solution and its applications are outlined below:

- The IR solution must be capable of operating multiple applications based on the identified needs of the public in the event of a health emergency. This IR solution and its applications will address current gaps in response and preparedness efforts faced by many jurisdictions for meeting the increased surge capacity demands on the health care delivery system that terrorism, accidents, disease outbreaks, and natural disasters could cause. This IR solution should assist in providing the public with adequate information to make educated decisions about perceived health concerns via telephone, potentially lessening the demand for evaluations at health care facilities.
- The implemented IR solution should support the following applications:
 - Point of Dispensing (POD) Application: The POD Application will disseminate information in a public health emergency to enable inbound callers to receive locations for drug dispensing sites specific to their county, based on the zip code that the caller enters. The callers dialing into the POD Application should be given clear directions from the menu messages to be able to repeat any message or the location of the drug dispensing sites. Callers should also be given a choice to select another zip code after getting information for their first entered zip code. The POD Application will be

designed to accommodate two language selections (English and Spanish) that the caller will select at the beginning of the call. The POD Application will also provide reporting on how many callers selected each of the available message options. The POD Application will be required to have the ability to provide an individual message for each zip code within a county to allow for the greatest potential for relaying customized information.

- Drug Identification (DI) Application: The DI Application will allow inbound callers to obtain self-service identification for the different appearances of antibiotic drugs that are being dispensed at POD sites during a public health emergency. The callers should be given clear directions from the menu messages and be able to repeat messages or descriptions of the identified drug. The caller should also have the ability to identify more than one drug appearance per call or to repeat messages. The application should have messages that refer callers to other resources if they cannot utilize the self-service application or the drug appearance is not included as an option (this could be modified to automatically transfer them to an information provider for assistance). This application will be designed to accommodate one language selection (English), however future programming changes may be needed for additional language selections that the caller will select at the beginning of the call (just as with the other three applications). The DI Application will also provide reporting on how many callers selected each of the drug identification options. The DI Application should be able to accommodate options for all expected antibiotic drug appearances that are to be distributed.
- Quarantine/Isolation (QI) Monitoring Application: The QI Monitoring Application should have the capability to automatically place outbound calls to individuals in home quarantine/isolation to assess their current health status. The directions given to the quarantined person by the application should be clear the person should have the ability to repeat a message. The application will be designed to accommodate two language selections (English and Spanish) that the call recipient will select at the beginning of the call. The application will call the quarantined person at specified time periods, provide them messages identifying the purpose of the call, require them to select an option that reflects their current health status (transferring them to an information provider for assistance if needed) and provide them information about who to call if assistance is needed before the next monitoring call. If a person does not answer a call upon the first attempt, the application will initiate a second call attempt within a defined time period. If the second call attempt goes unanswered, the application will flag this person as non-compliant. The QI Monitoring Application will also provide reports on compliance so follow ups can be made by appropriate agencies.
- Frequently Asked Question (FAQ) Library Application: The FAQ Library Application will disseminate up-to-date, consistent and accurate information approved by health department epidemiologists to the public and health care providers from a searchable library of FAQs. Callers dialing into this application should be able to select desired information with discernable directions from the application including maneuverability throughout the menus. Also callers should have the ability to select an option to speak with an Information Provider, if needed. The application will provide reports on how many callers selected all message options.

- The IR solution and its applications should be implemented without affecting daily patient care business.
- The IR solution should be implemented with adequate trunking capacity (call volume capacity) incorporated; thus minimizing delay to disseminate information to the general public. The key to handling call surges effectively during a health emergency is that consistent and accurate information be disseminated to inform the greatest number of callers with minimal staffing levels.
- The IR solution should be implemented such that the telephone switch (e.g. for our center an Avaya S8700 PBX) is the primary contact point to the public switched telephone network (PSTN). This configuration allows the proper resource to handle the call most effectively and thereby benefits from the other call handling capabilities of the telephone switch.

3.2 Functional Requirements

The following functional requirements have been identified for an IR solution within our call center infrastructure. It is not necessary that other call centers create an IR solution with all the same specifications, but we recommend considering them in the development process.

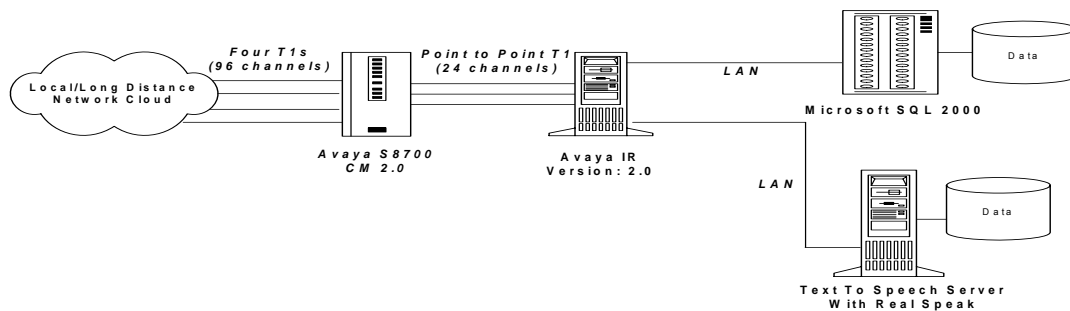
Technical Specifications

The proposed IR solution was developed and implemented using the following hardware and software:

Platform

- Avaya IR version 2.0 on a Sun Microsystems Blade 150 running Solaris UNIX software.
- Real Speak version on separate windows server Dell Power-Edge 2850 Intel Xeon Processor at 2.8 GHZ/2MB Cache; Operating System = Windows Server 2003 R2 Standard Edition. Memory= 1GB DDR2 400MHz.
 - The Real Speak solution will be used in future application modifications to have the IR play back to caller text file as speech, utilizing licensed channels to provide 6 simultaneous instances of either English or Spanish text-to-speech connections.
- Microsoft SQL 2000 is used to create tables for the IR to access for either playing back text records in voice or pulling records from tables directing the IR to call phone numbers. The IR also updates tables on the SQL server with record status for reporting purposes.

Diagram of the implemented IR solution is shown below:



Integration

- The IR solution should be capable of integrating with existing telephone switch.
- The IR solution should be capable of integrating within existing LAN and allow more than one user to log into the system at a time.
- The IR solution should have the ability to operate multiple applications simultaneously (POD, DI, QI Monitoring and FAQ Library applications) without compromising current call traffic.
- This IR solution should be “self-contained” and easy to administer.

Functionality

- The IR solution should be capable of a minimum of 24 T1 channels and should have the flexibility to expand to 96 channels without the need of purchasing another IR system (expandability of the IR system should be cost effective).
- The IR solution should have the ability to organize, backup, and save applications and operating system files to the LAN as well as to external media for off-site storage.
- The IR solution should have an easy reporting method to retrieve calls from a given application in a fast and efficient manner. Search criteria are items such as, but not limited to which application was selected by caller, call center the call may flow out to, date of call, time of call, and duration of call.
- The IR solution should be a validated system. All documentation of the systems operations should be proven to work PRIOR to the installation of said system as well as afterwards. Furthermore, the system should not lose archived recorded announcements. Refer to the following link for questions regarding validated system: <http://www.fda.gov/cdrh/comp/guidance/938.pdf>.

- The IR solution should have alarm and alarm reporting capabilities such as (but not limited to) audible alarms, e-mail notification, dialing out for assistance (SOS System), and 24 X 7 service/support.
- The IR solution should have built-in redundancy such that no information is lost during an alarm or if a system failure event were to occur.
- The IR solution should be capable of unique login identification along with the capability of user rights (allowing only certain access to system for some logins and more access for other logins - allowing running of multiple applications).
- The IR solution should have an audit mechanism to track of who has logged into system and their actions which ideally can be printed out or exported to a file (HIPAA Compliance).
- The IR solution should be compatible with current LAN and System Applications (implementing this solution should not cause other Windows-based applications to fail).

Performance

- The IR solution should be capable of meeting the Telecommunications Standard of five nine availability; the system must be fully functional 99.999 percent of the time, maintenance time excepted.
- The IR solution should be capable of having more than one user logged into the system for listening to or modifications to applications from different channels at the same time.
- The IR solution should be capable of operating multiple different applications in different call centers using different criteria; flexibility for changing business needs.
- The IR solution should be capable of archiving and retrieving records for future research in an efficient manner.
- The IR solution should have reporting capabilities with standard output formats that allow for sharing without special software.

Scalability

- The IR system should have built-in capacities for additional applications and other “Right to Use” ports that may be required for further expansion (such as speech-to-text or speech recognition).

Ease of Use

- The IR solution should be easy to use and maintain for both day-to-day monitoring as well as implementing new applications to serve evolving business needs. It is strongly suggested that the system be capable of rapidly receiving changes to announcements or a specific application in order to meet the changing needs during an emergency. Furthermore, the administrators of this system

must have the capability of monitoring the progress of said changes to ensure that needs are being met.

- The vendor of the IR solution should provide on-site training for systems administrators as well as on-site training for all initial users of the IR solution. Training will empower systems administrators to operate and maintain the system and its applications and to explore their adaptation for other uses. User training will empower supervisors and call center management to run reports as well as collect and review data from caller interactions with applications to analysis operational effectiveness.

Security

- The IR system should be capable of segmenting users to certain levels of access within the system including ability to set up user objects/rights.
- The IR solution should integrate with current Windows security user objects within the LAN.

Manageability

- Ideally, a call center would have the ability to perform remote administration duties on the IR solution in case staff members cannot physically access the facility; the solution should have the ability to allow technicians to remotely access the device and manage all functions as if physically at facility.

4.0 Interactive Response Tool Design Document

We chose to use the Department of Homeland Security's National Planning Scenarios to assure consistency with other preparedness and response efforts that are being developed. While these scenarios do not cover all possibilities for health emergencies, they do include a wide spectrum of disasters that communities could face. Though there are many other potential disaster scenarios that have been developed, these scenarios have been developed in a very structured manner and with participation of numerous Federal agencies.

We reviewed all 15 scenarios and determined which could benefit from utilization of the potential response capabilities of community health call centers. We then developed a matrix that lists each scenario including expected casualties, infrastructure damage, evacuation/displacement of persons, sheltering and victim care strategies. In addition, we determined the necessary potential community health call center responses. The six potential response capabilities for community health call centers include providing health information, disease surveillance, triage/decision support, quarantine/isolation support, outpatient drug information/adverse event reporting and mental health issues.

We decided to focus our model development on scenarios that: involved great health impacts, had potential for many "worried well" (those with little or no injury that could overwhelm health systems), could benefit from home management/sheltering in place strategies, and included intact community infrastructure so that call centers would be able to operate. It was determined that the four biological related scenarios (Biological Attack – Aerosol Anthrax, Biological Disease Outbreak – Pandemic Influenza, Biological Attack – Plague, Biological Attack – Food Contamination) afforded the opportunity to involve all six potential response capabilities for community health call centers.

The resulting applications are for Quarantine and Isolation (Q/I) Monitoring, Drug Identification (DI), Point of Dispensing (POD), and Frequently Asked Questions (FAQ) Library.

4.1 Quarantine/Isolation Monitoring Application

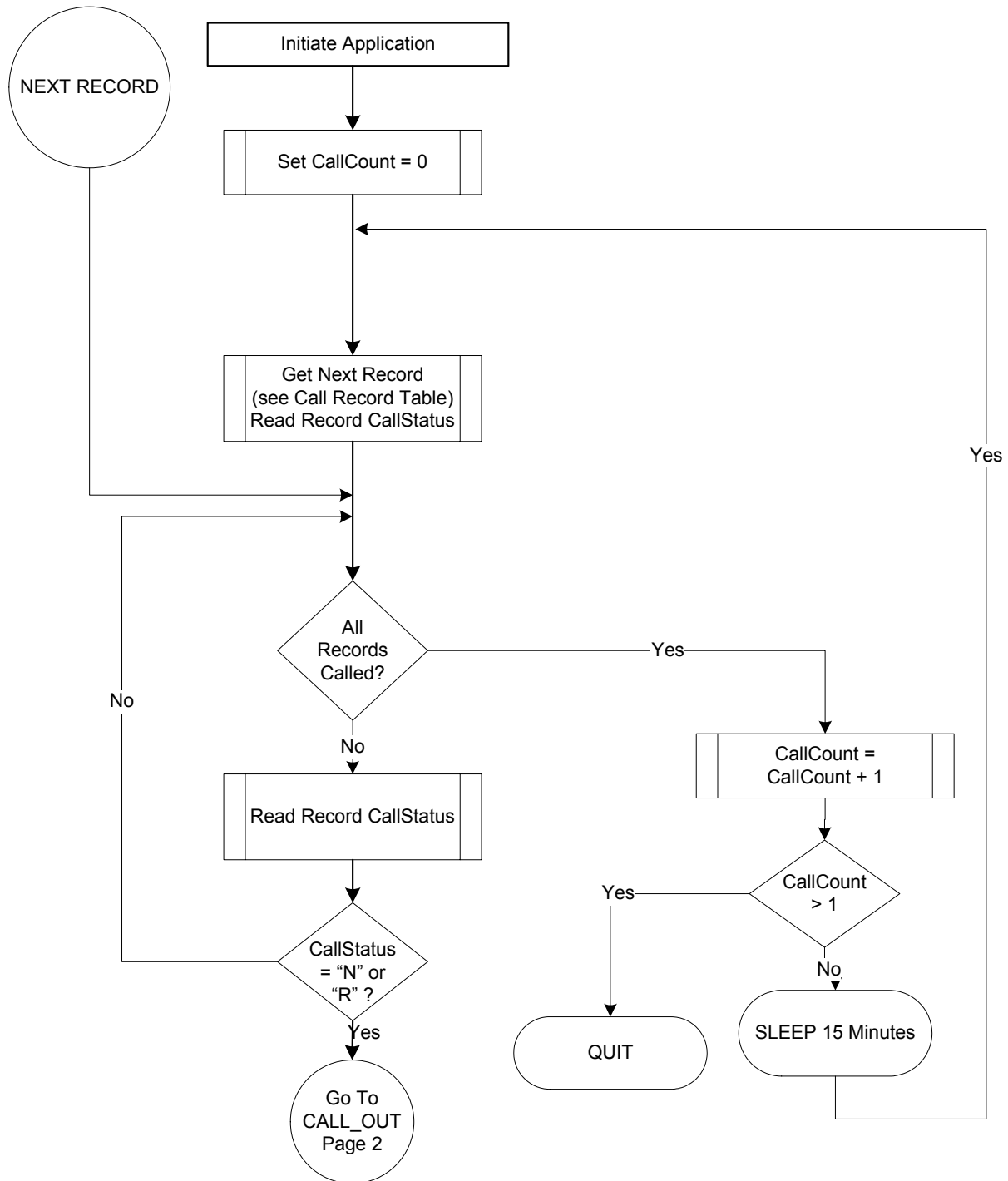
The QI Monitoring Application should have the capability to automatically place outbound calls to individuals in home quarantine/isolation to assess their current health status. The directions given to the quarantined person should be clear and the person should have the ability to repeat a message. The application will be designed to accommodate two language selections (English and Spanish) that the call recipient will select at the beginning of the call. The application will call the quarantined person at the specified time periods, provide messages identifying the purpose of the call, require the person to select an option that reflects their current health status (transferring them to an information provider for assistance if needed), and provide information about who to call if assistance is needed before the next monitoring call. If a person does not answer a call upon the first attempt, the application will initiate a second call attempt within a defined time period. If the second call attempt goes unanswered, the application will flag this person as non-compliant. The QI Monitoring Application will also provide reports on compliance to further follow-ups can be made by appropriate agencies. Future scope changes will include ability to dial out 12,000 calls during a ten-hour period (requiring ten simultaneous outbound calls on IR).

The following application was the results of modifications following exercises with the San Luis Valley Region Exercise, October 2005 and the North Central Region Exercise, May 2006.

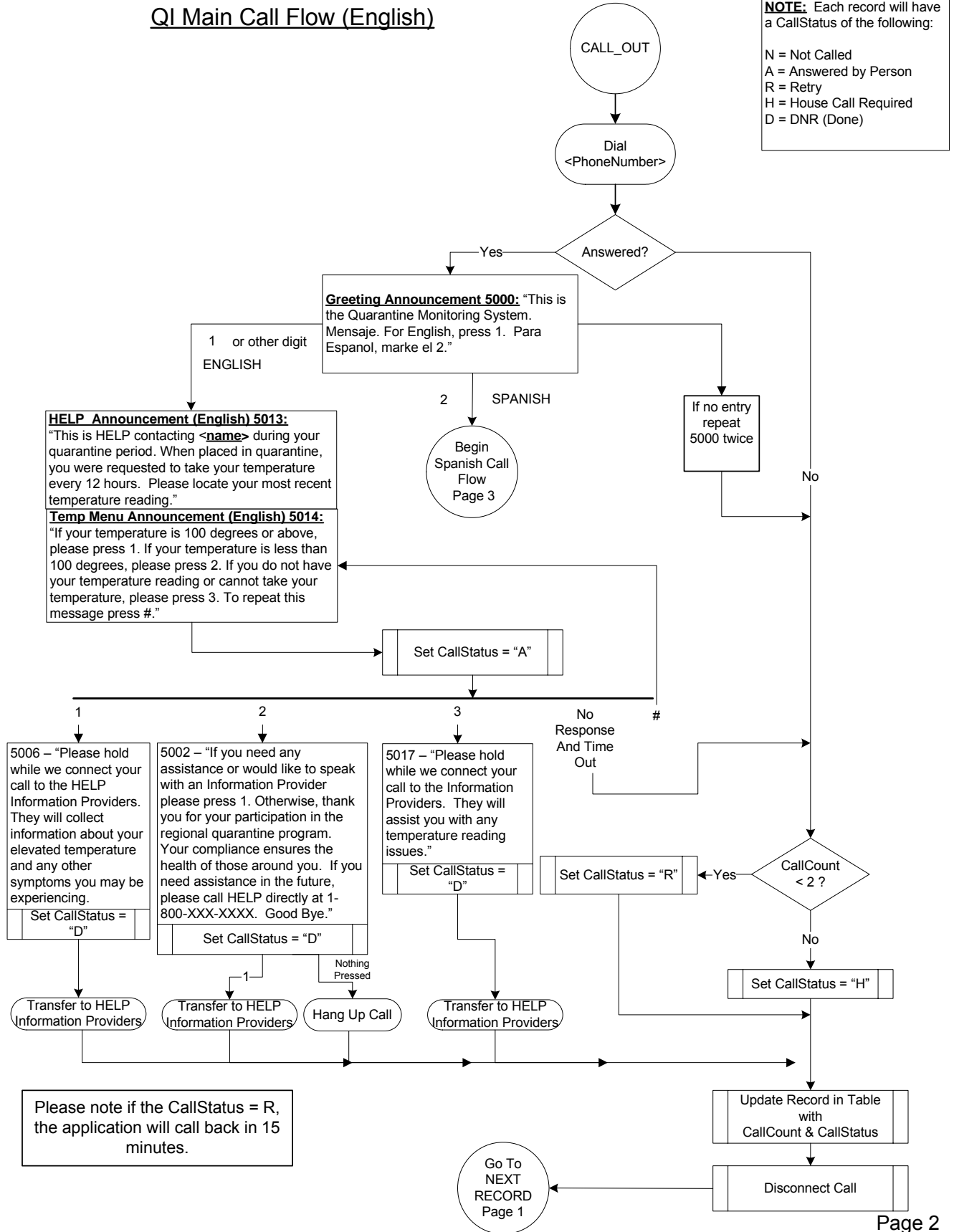
Application Data Flow

NOTE: Each record will have a CallStatus of the following:

N = Not Called
A = Answered by Person
R = Retry
H = House Call Required
D = DNR (Done)



QI Main Call Flow (English)

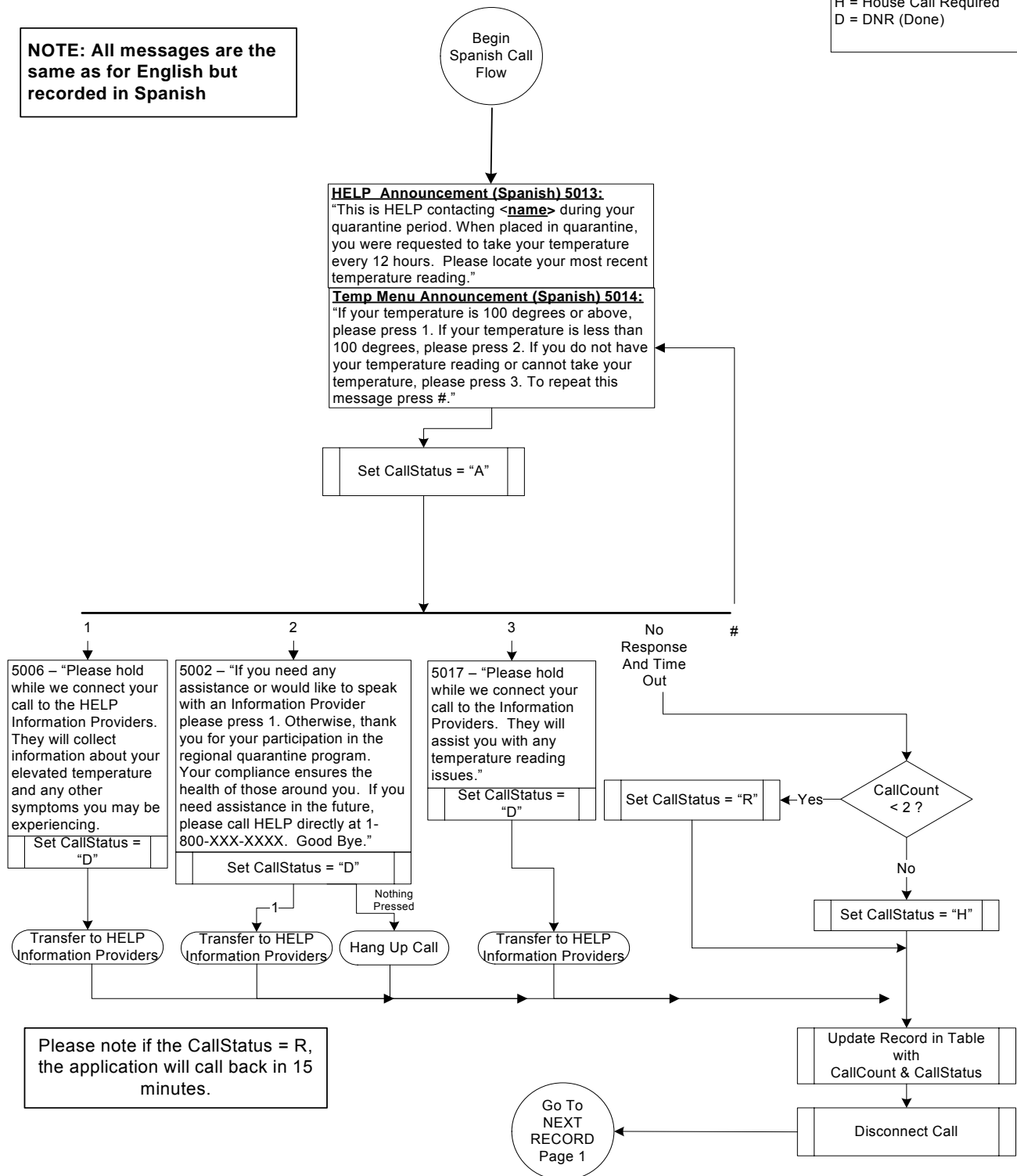


QI 2nd Language Call Flow (Spanish)

NOTE: All messages are the same as for English but recorded in Spanish

NOTE: Each record will have a CallStatus of the following:

N = Not Called
A = Answered by Person
R = Retry
H = House Call Required
D = DNR (Done)



Announcements	
<u>Greeting Announcement 5000:</u>	"This is the Quarantine Monitoring System. Mensaje. For English, press 1. Para Espanol, marke el 2."
<u>HELP Announcement 5013:</u>	"This is HELP contacting <name> during your quarantine period. When placed in quarantine, you were requested to take your temperature every 12 hours. Please locate your most recent temperature reading."
<u>Temp Menu Annoucement 5014:</u>	"If your temperature is 100 degrees or above, please press 1. If your temperature is less than 100 degrees, please press 2. If you do not have your temperature reading or cannot take your temperature, please press 3. To repeat this message press #."
<u>Temperature >100 Announcement 5006:</u>	"Please hold while we connect your call to the HELP Information Providers. They will collect information about your elevated temperature and any other symptoms you may be experiencing."
<u>Temperature <100 Announcement 5002:</u>	"If you need any assistance or would like to speak with an Information Provider please press 1. Otherwise, thank you for your participation in the regional quarantine program. Your compliance ensures the health of those around you. If you need assistance in the future, please call HELP directly at 1-800-XXX-XXXX. Good Bye."
<u>Transfer to Information Provider Announcement 5017:</u>	"Please hold while we connect your call to the Information Providers. They will assist you with any temperature reading issues."

NOTE: All messages should be recorded for both English and other language (Spanish)

Call Record Table (Example)

Record Table file is loaded into database before each calling period.

SQL Table format for Quarantine (csv):

"<CallCount>","<Name>","<PhoneNumber>","<CallStatus>"

CallCount	Name	PhoneNumber	CallStatus
0	John Doe	5555551234	N
0	Jane Smith	5555557890	N
0	Pete Black	5555553456	N
0	Kelly Green	5555552345	N
0	Jack Black	5555557654	N
0	Bill Blue	5555553465	N
0	Nancy White	5555550098	N

After 1st run thru Table, everyone except Bill and Nancy answered call and provided a response

CallCount	Name	PhoneNumber	CallStatus
1	John Doe	5555551234	D
1	Jane Smith	5555557890	D
1	Pete Black	5555553456	D
1	Kelly Green	5555552345	D
1	Jack Black	5555557654	D
1	Bill Blue	5555553465	R
1	Nancy White	5555550098	R

After 2nd run thru Table, Bill answered and provided a response but Nancy did not

CallCount	Name	PhoneNumber	CallStatus
1	John Doe	5555551234	D
1	Jane Smith	5555557890	D
1	Pete Black	5555553456	D
1	Kelly Green	5555552345	D
1	Jack Black	5555557654	D
2	Bill Blue	5555553465	D
2	Nancy White	5555550098	H

Report would be generated that indicates that Nancy requires a house call, and the other 6 people are being successfully monitored by application

4.2 Drug Identification (DI) Application

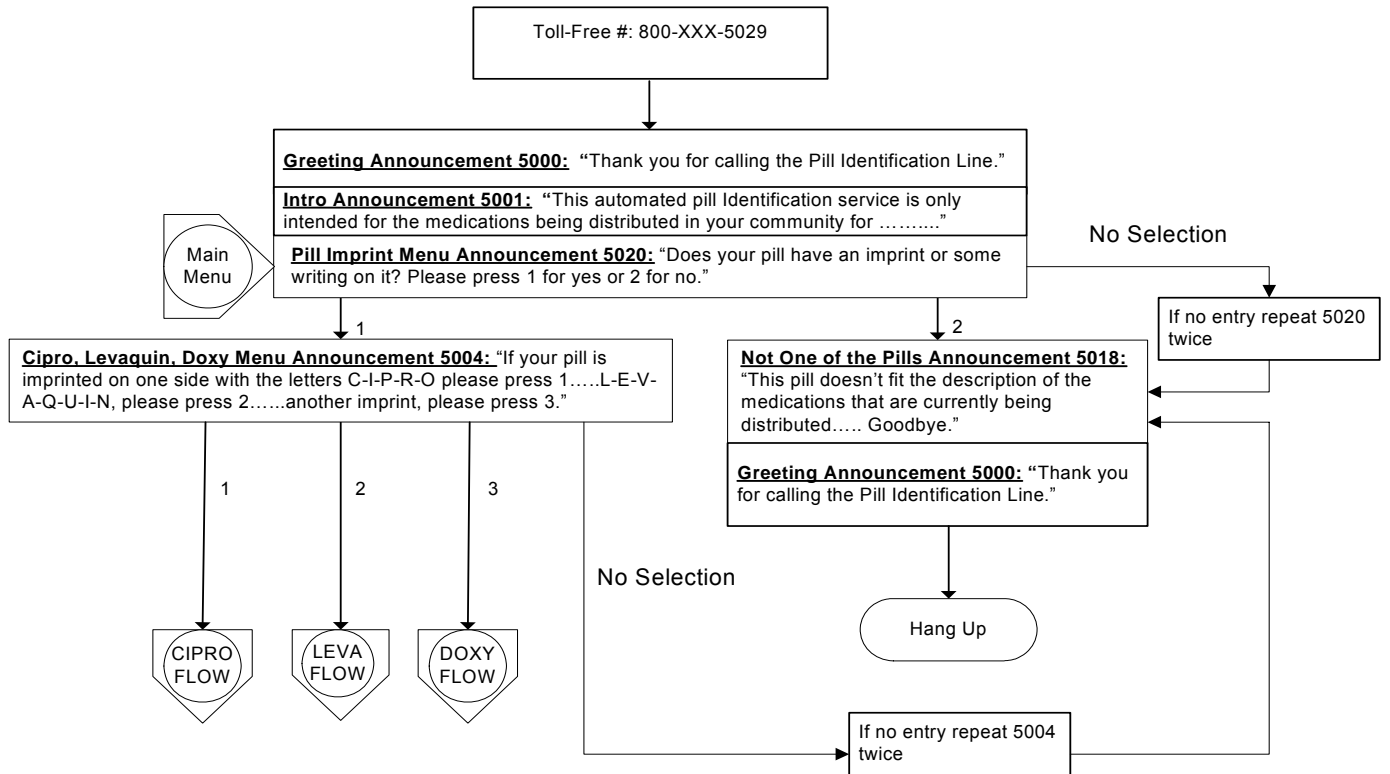
Drug Identification (DI) Application Contents

DI Main Call Flow (English)	1
CIPRO Flow	2
LEVA Flow	3
DOXY Flow	4
DOXY Cap Flow	5
DOXY Tab Flow	6
General and Ciprofloxacin Announcements	7
Levaquin and Doxycycline Announcements	8

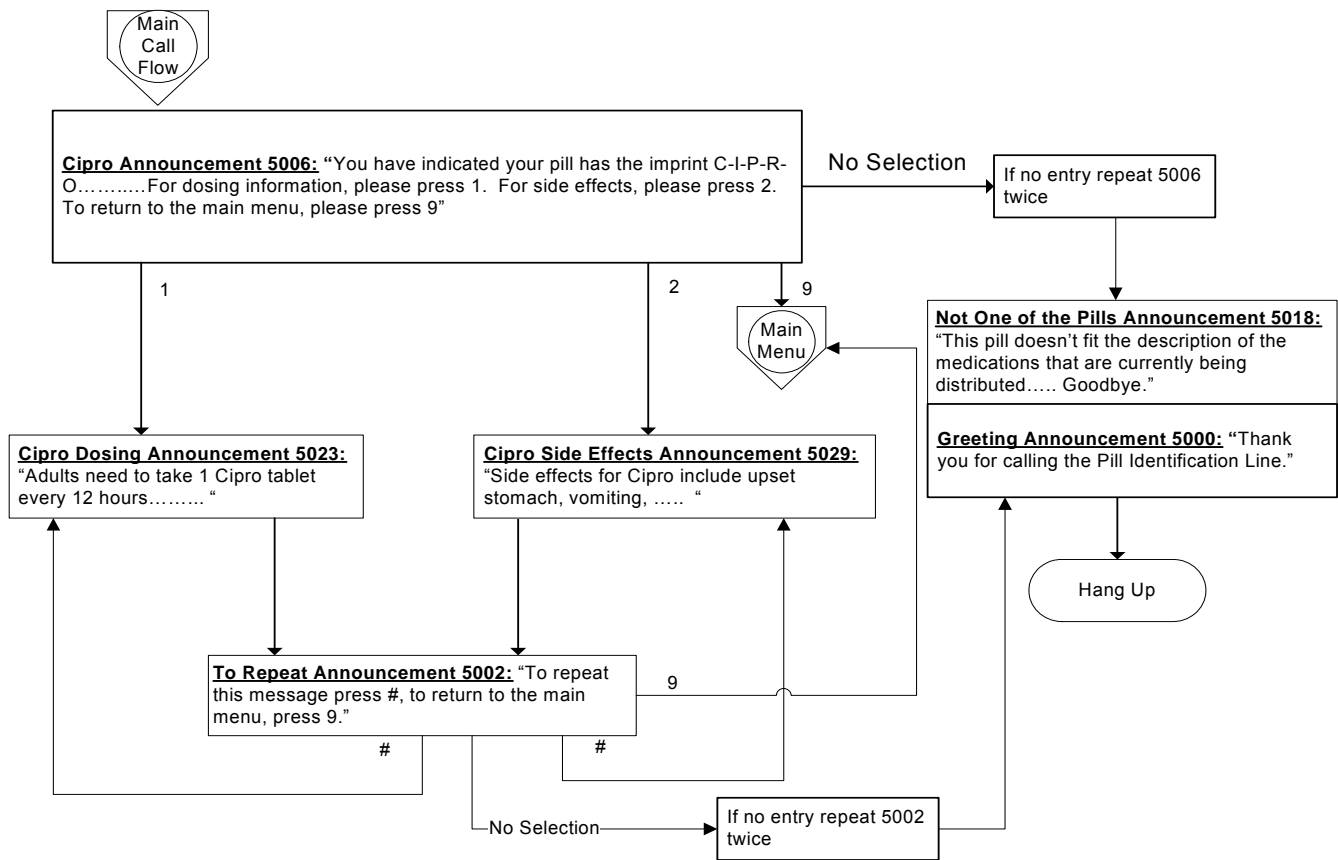
Introduction

The DI application will allow inbound callers to obtain self-service identification for the different appearances of antibiotic drugs that are being dispensed at POD sites during a public health emergency. The callers should be given clear directions from the menu messages and be able to repeat messages or descriptions of the identified drug. The caller should also have the ability to identify more than one drug appearance per call or to repeat messages. The application should have messages that refer callers to other resources if they cannot utilize the self-service application or the drug appearance is not included as an option (if it could be modified to automatically transfer them to an information provider for assistance). This application will be designed to accommodate one language selection (English). However, future programming changes may be needed for additional language selections that the caller will select at the beginning of the call (just as with the other three applications). The DI application will also provide reporting on how many callers selected each of the drug identification options. The DI application should be able to accommodate options for all expected antibiotic drug appearances that are to be distributed.

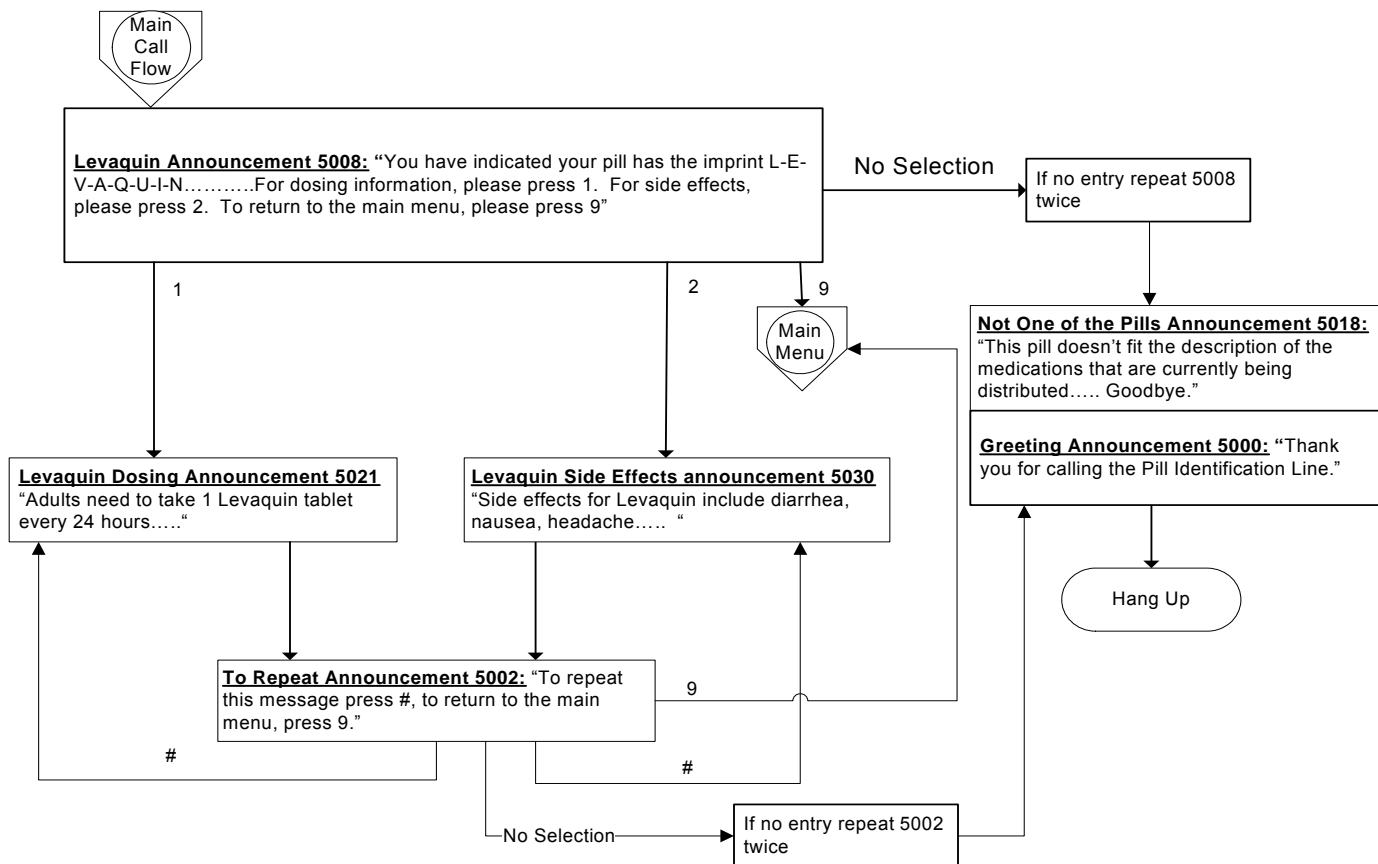
DI Main Call Flow (English)



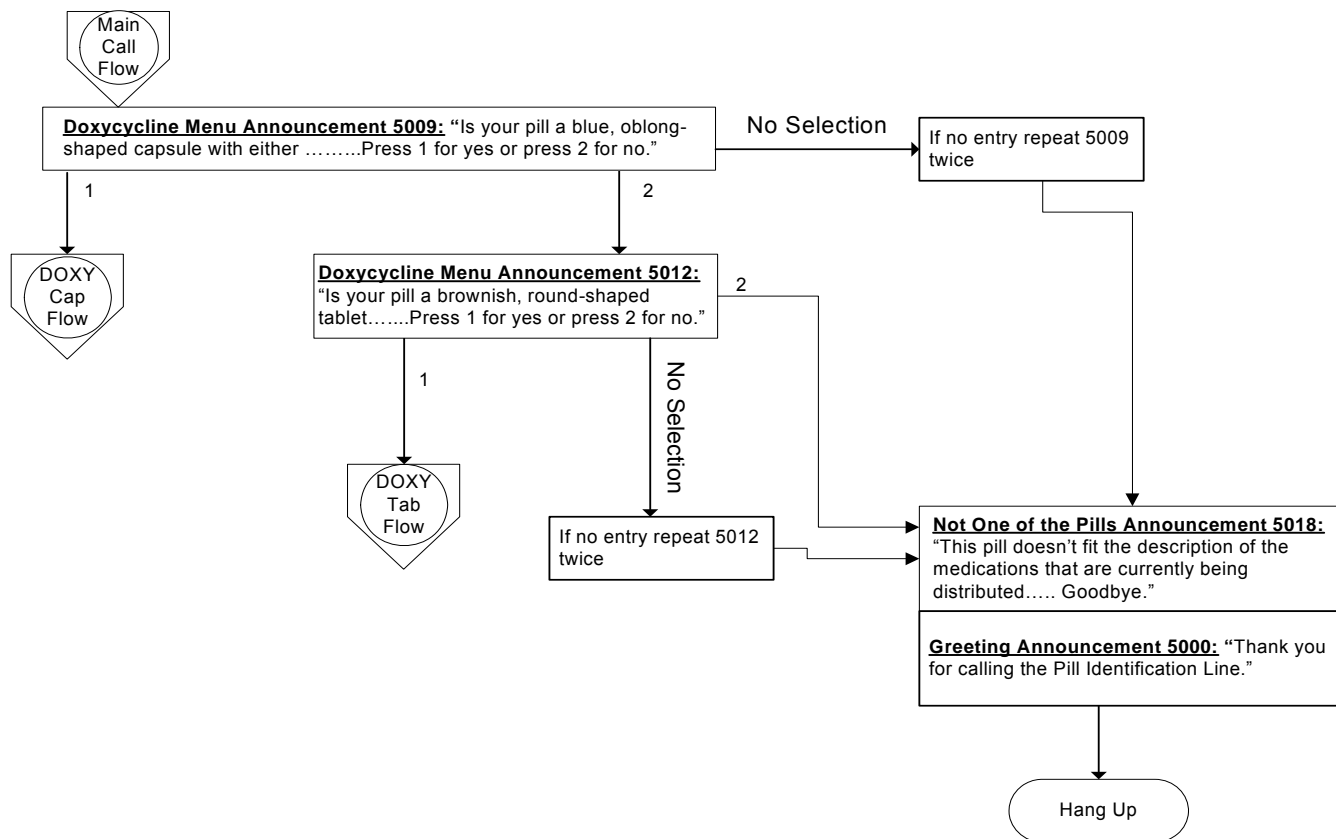
CIPRO Flow



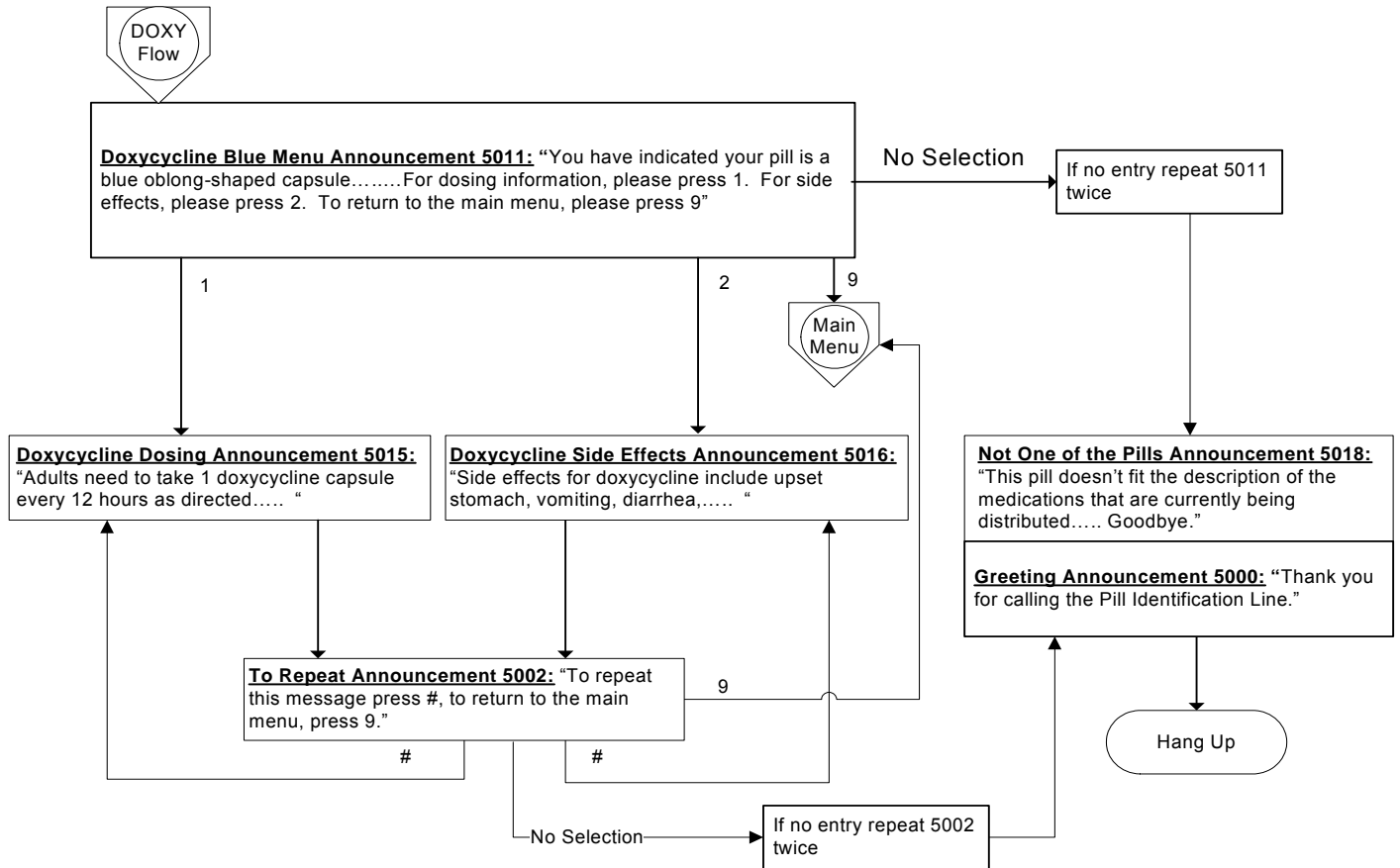
LEVA Flow



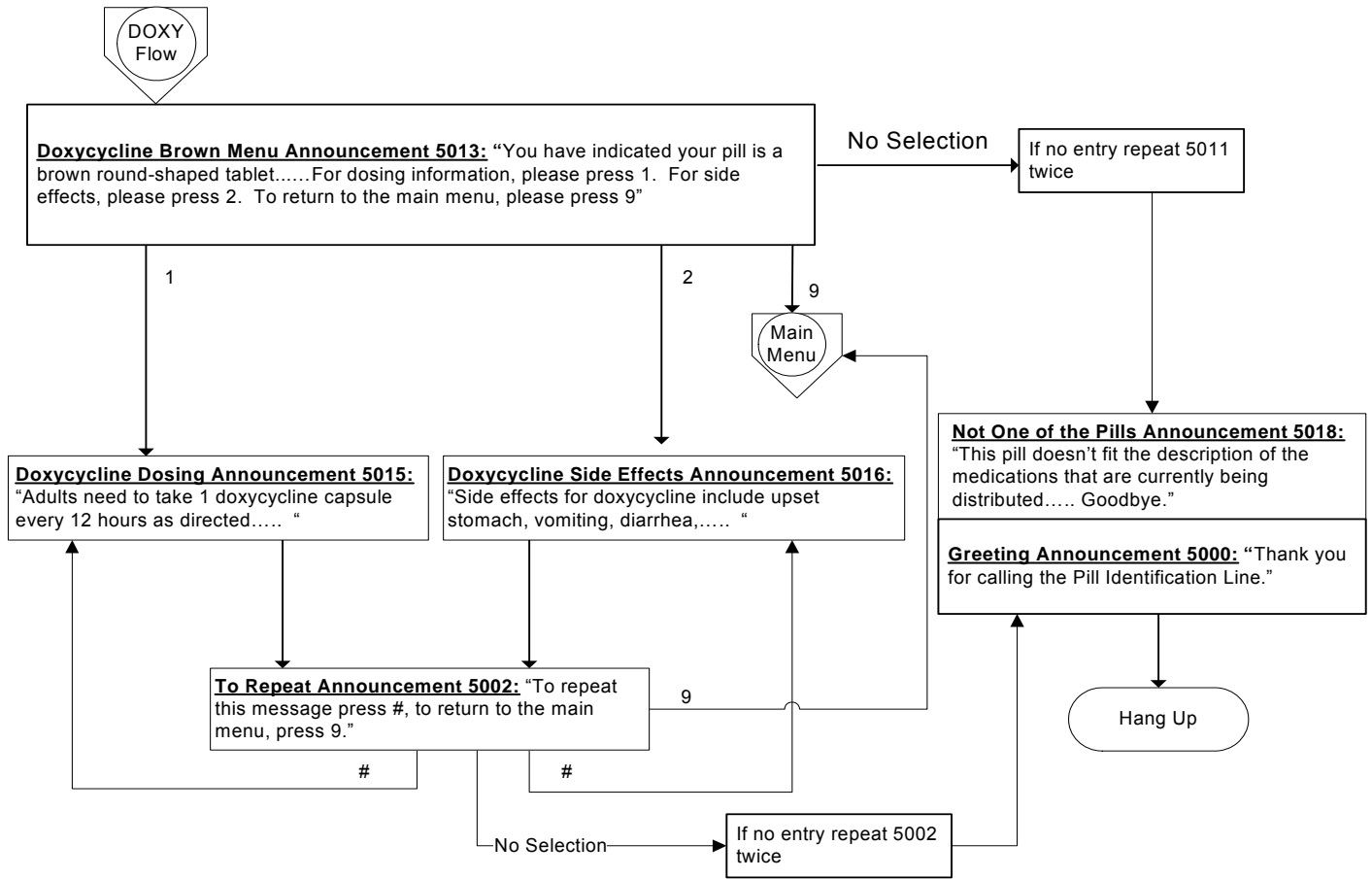
DOXY Flow



DOXY Cap Flow



DOXY Tab Flow



General & Ciprofloxacin Announcements

Greeting Announcement 5000: "Thank you for calling the Pill Identification Line."

Intro Announcement 5001: "This automated pill identification service is only intended for the medications being distributed in your community for illness prevention by public health agencies. In order for you to use this service, you must have the pill in front of you. You will need to read the letters and numbers on the pill and answer a few questions. If you cannot read the letter and numbers on the pill yourself, please have someone assist you with this before proceeding. This service cannot help you identify other medications. For identification of other medications, you should hang up and contact your local pharmacy or poison center."

Pill Imprint Menu Announcement 5020: "Does your pill have an imprint or some writing on it? Please press 1 for yes and 2 for no."

Not One of the Pills Announcement 5018: "This pill does not fit the description of the medications that are currently being distributed for illness prevention. Please contact your pharmacist or poison center for further assistance. Good Bye."

To Repeat Announcement 5002: "To repeat this information, please press the # sign. To return to the main menu, please press 9."

Cipro, Levaquin, Doxy Menu Announcement 5004: "If your pill is imprinted on one side with the letters C-I-P-R-O, please press 1. If your pill is imprinted on one side with the letters L-E-V-A-Q-U-I-N, please press 2. If your pill has another imprint, please press 3."

Cipro Announcement 5006: "You have indicated that your pill has the imprint C-I-P-R-O. Your pill is an antibiotic called Cipro. For dosage information, please press 1. For side effects, please press 2. To return to the main menu, please press 9."

Cipro Dosing Announcement 5023: "Adults need to take 1 Cipro tablet every 12 hours as directed. A child's dose depends on body weight. Give the medicine to your child as directed by the doctor. It is best to take Cipro 2 hours before or after a meal with at least one large glass of water. However, if an upset stomach occurs, Cipro may be taken with food. Avoid dairy products such as milk and yogurt for at least 3 hours before and after taking the medicine. If you take vitamins or antacids such as Tums or Maalox, take them 6 hours before or 2 hours after taking Cipro. If you miss a dose, start again taking one tablet every 12 hours. Do not take 2 pills to make up for the missed dose. Finish all your pills, even if you feel okay, unless your doctor tells you to stop. If you stop taking this medicine too soon, you may become ill."

Cipro Side Effects Announcement 5029: "Side effects for Cipro include upset stomach, vomiting, diarrhea, fatigue, dizziness or headache. If you have problems with any of these symptoms, tell your doctor. Less common side effects include pain in arms or legs, changes in vision, restlessness, ringing in the ears, or mental changes. If any of these symptoms occur, call your doctor right away. Severe allergic reactions are very rare. Signs of an allergic reaction include rash, itching, swelling of the tongue, hands or feet, fever, or trouble breathing. If any of these symptoms occur, call your doctor right away."

Levaquin & Doxycycline Announcements

Levaquin Announcement 5008: “You have indicated that your pill has the imprint L-E-V-A-Q-U-I-N. Your pill is an antibiotic called Levaquin. For dosage Information, please press 1. For side effects, please press 2. To return to the main menu, please press 9.”

Levaquin Dosing announcement 5021: “Adults need to take 1 Levaquin tablet every 24 hours as directed. Safety of Levaquin in children has not been established and therefore should only be used for children under the direction of your doctor. Take Levaquin with or without food, but avoid taking Levaquin within two hours of taking antacids like Tums or Maalox, iron tablets, zinc, ulcer medications like Sucralfate or the antiretroviral medication Videx. If you are diabetic, please consult your doctor before taking Levaquin. Pregnant or breastfeeding women should consult their doctor before taking Levaquin. If you miss a dose, start again taking 1 pill every 24 hours. Do not take 2 pills to make up for the missed dose. Finish all your pills, even if you feel ok, unless your doctor tells you to stop. If you stop this medication too soon, you may become ill.”

Levaquin Side Effects Announcement 5030: “Side effects for Levaquin include diarrhea, nausea, headache, muscle aches, blurred vision, heartburn, and constipation. Serious side effects include high or low blood sugar or allergic reactions. If any of these symptoms occur, contact your doctor right away.”

Doxycycline Menu Announcement 5009: “Is your pill a blue, oblong-shaped capsule with either “Z-2-9-8-5” or “D-A-N-5-4-4-0” printed on it? Press 1 for yes or press 2 for no.”

Doxycycline Menu Announcement 5012: “Is your pill a brownish, round-shaped tablet with either “Z-3-6-2-6” or “D-A-N-5-5-5-3” printed on it? Press 1 for yes or press 2 for no.”

Doxycycline Blue Menu Announcement 5011: “You have indicated your pill is a blue oblong-shaped capsule with either Z-2-9-8-5 or D-A-N-5-4-4-0 printed on it. This pill is an antibiotic called doxycycline. Doxycycline is spelled D-O-X-Y-C-Y-C-L-I-N-E. For dosage information, please press 1. For side effects, please press 2. To return to the main menu, please press 9.”

Doxycycline Dosage Announcement 5015: “Adults need to take 1 doxycycline tablet every 12 hours as directed. A child’s dose depends on body weight. Give the medicine to your child as directed by the doctor. Take doxycycline with food and at least one full glass of water. Avoid taking antacids (like Tums or Maalox), cholestyramine (like Questran), colestipol (like Colestid), dairy products (like milk or yogurt) or vitamins 3 hours before or after taking doxycycline. If you miss a dose, start again taking 1 pill every 12 hours. Do not take 2 pills to make up for the missed dose. Finish all your pills, even if you feel okay, unless your doctor tells you to stop. If you stop this medication too soon, you may become ill.”

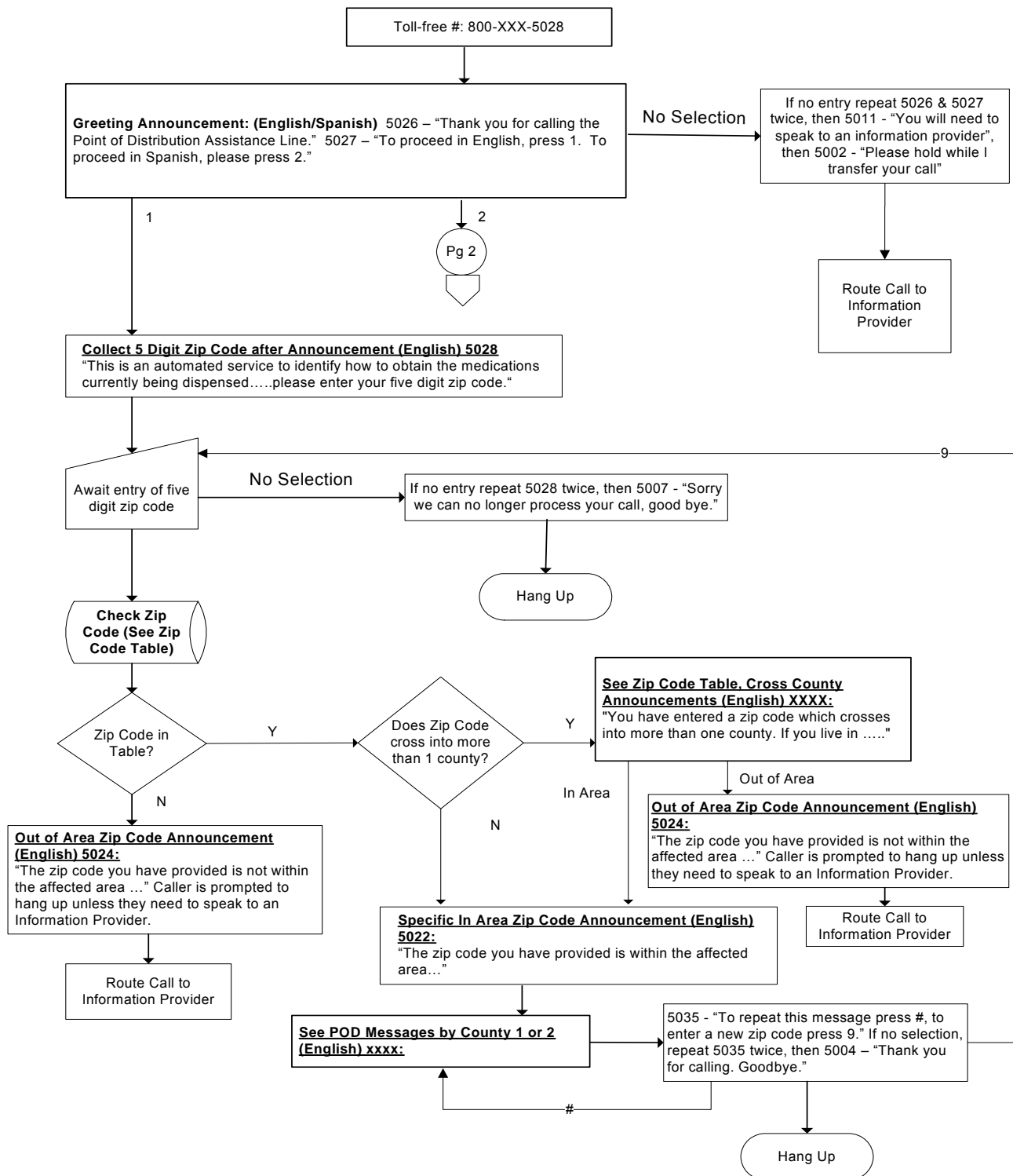
Doxycycline Side Effects Announcement 5016: “Side effects for doxycycline include upset stomach, vomiting, or diarrhea. If you have problems with any of these symptoms, tell your doctor. Less common side effects include dark urine, yellowing of the eyes or skin, sore throat, fever, unusual bleeding or bruising, fatigue, white patches in the mouth. If any of these symptoms occur, call your doctor right away. Allergic reactions to doxycycline are rare. Signs of an allergic reaction are rash, itching, swelling of the tongue, hands or feet, fever, and trouble breathing. If any of these symptoms occur, call you doctor right away.”

Doxycycline Brown Menu Announcement 5013: “You have indicated your pill is a brown round-shaped tablet with either Z-3-6-2-6 or D-A-N-5-5-5-3 printed on it. This pill is an antibiotic called doxycycline. Doxycycline is spelled D-O-X-Y-C-Y-C-L-I-N-E. For dosing information, please press 1. For side effects, please press 2. To return to the main menu, please press 9.”

4.3 Point of Dispensing (POD) Application

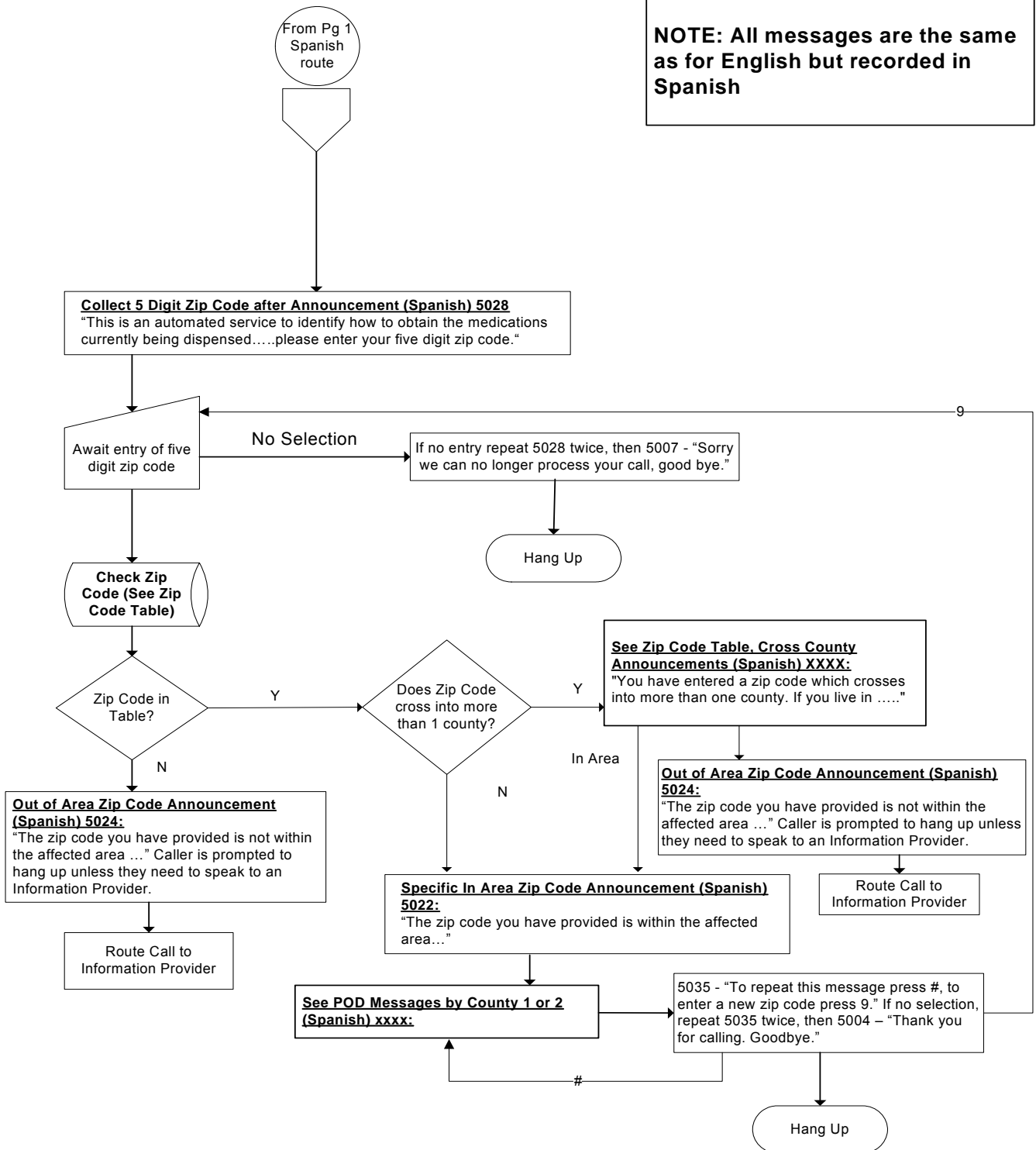
The Point of Dispensing (POD) application will disseminate information in a public health emergency to enable inbound caller to receive locations for drug dispensing sites specific to their county, based on the zip code that the caller enters. The callers dialing into the POD application should be given clear directions from the menu messages to be able to repeat any message or the location of the drug distribution sites. Callers should also be given a choice to select another zip code after getting information for their first entered zip code. The POD application will be designed to accommodate two language selections (English and Spanish) that the caller will select at the beginning of the call. The POD application will also provide reporting on how many callers selected each of the message options. The POD application will be required to have the ability to provide an individual message for each zip code within a county to allow for the greatest potential for relaying customized information.

POD Main Call Flow (English)



POD 2nd Language Call Flow (Spanish)

NOTE: All messages are the same as for English but recorded in Spanish



Example of Zip Code Tables and Announcements

The table below shows examples of zip code listings for Denver and environs with the number of the recorded announcements that would be given for each county. Examples of announcements for different zip codes follow the zip code listings.

Zip Code Table (Part 1)

Includes Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, and Jefferson Counties

Note: Any 5 digit number not contained in these tables will get message #5024 (Out of Area Zip Code Announcement)

ZIP CODE	CITY	1st COUNTY	2nd COUNTY	3rd COUNTY	4th COUNTY	XCOUNTY MESSAGE#	AFTER #5022, WILL TRANSFER TO POD MESSAGE #
80001	ARVADA	JEFFERSON					5509
80002	ARVADA	JEFFERSON					5509
80003	ARVADA	ADAMS	JEFFERSON			5006	1=5500, 2=5509
80004	ARVADA	JEFFERSON					5509
80005	ARVADA	JEFFERSON					5509
80006	ARVADA	JEFFERSON					5509
80007	ARVADA	JEFFERSON					5509
80010	AURORA	ADAMS	ARAPAHOE			5008	1=5500, 2=5501
80011	AURORA	ADAMS	ARAPAHOE			5008	1=5500, 2=5501
80012	AURORA	ARAPAHOE					5501
80013	AURORA	ARAPAHOE					5501
80014	AURORA	ARAPAHOE	DENVER			5016	1=5501, 2=5505
80015	AURORA	ARAPAHOE					5501
80016	AURORA	ARAPAHOE					5501
80017	AURORA	ARAPAHOE					5501
80018	AURORA	ARAPAHOE					5501
80019	AURORA	ADAMS					5500
80020	BROOMFIELD	ADAMS	BOULDER	BROOMFIELD	JEFFERSON	5005	1=5500, 2=5502, 3=5023 , 4=5509
80021	BROOMFIELD	BROOMFIELD	JEFFERSON			5021	1=5503, 2=5509
80022	COMMERCE CITY	ADAMS					5500
80024	DUPONT	ADAMS					5500
80025	ELDORADO SPRGS	BOULDER					5502
80026	LAFAYETTE	BOULDER					5502
80027	LOUISVILLE	BOULDER					5502
80028	LOUISVILLE	BOULDER					5502
80030	WESTMINSTER	ADAMS					5500
80031	WESTMINSTER	ADAMS	JEFFERSON			5006	1=5500, 2=5509
80033	WHEAT RIDGE	JEFFERSON					5509
80034	WHEAT RIDGE	JEFFERSON					5509
80035	WESTMINSTER	ADAMS					5500
80036	WESTMINSTER	ADAMS					5500
80037	COMMERCE CITY	ADAMS					5500
80038	BROOMFIELD	BOULDER					5502
80040	AURORA	ADAMS					5500
80041	AURORA	ARAPAHOE					5501
80042	AURORA	ADAMS					5500
80044	AURORA	ARAPAHOE					5501
80045	AURORA	ADAMS					5500
80046	AURORA	ARAPAHOE					5501
80047	AURORA	ARAPAHOE					5501
80101	AGATE	ADAMS	ELBERT			5013	1=5500, 2=5507
80102	BENNETT	ADAMS	ARAPAHOE	ELBERT		5033	1=5500, 2=5501, 3=5507
80103	BYERS	ARAPAHOE					5501
80104	CASTLE ROCK	DOUGLAS					5506
80105	DEER TRAIL	ADAMS	ARAPAHOE			5008	1=5500, 2=5501
80106	ELBERT	DOUGLAS	ELBERT			5030	1=5506, 2=5507
80107	ELIZABETH	ELBERT					5507
80108	CASTLE ROCK	DOUGLAS					5506
80109	CASTLE ROCK	DOUGLAS					5506
80110	ENGLEWOOD	ARAPAHOE	DENVER			5016	1=5501, 2=5505
80111	ENGLEWOOD	ARAPAHOE					5501
80112	ENGLEWOOD	ARAPAHOE	DENVER	DOUGLAS		5014	1=5501, 2=5505, 3=5506

Note: Message 5023 is for certain residents of Broomfield County who are to get medications via the US Postal Service

Zip Code Table (Part 2)

Includes Adams, Arapahoe, Boulder, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, and Jefferson Counties

Note: Any 5 digit number not contained in these tables will get message #5024 (Out of Area Zip Code Announcement)

ZIP CODE	CITY	1st COUNTY	2nd COUNTY	3rd COUNTY	4th COUNTY	XCOUNTY MESSAGE#	AFTER #5022, WILL TRANSFER TO POD MESSAGE #
80113	ENGLEWOOD	ARAPAHOE					5501
80116	FRANKTOWN	DOUGLAS					5506
80117	KIOWA	ELBERT					5507
80118	LARKSPUR	DOUGLAS					5506
80120	LITTLETON	ARAPAHOE	DOUGLAS			5019	1=5501, 2=5506
80121	LITTLETON	ARAPAHOE					5501
80122	LITTLETON	ARAPAHOE					5501
80123	LITTLETON	ARAPAHOE	DENVER	JEFFERSON		5032	1=5501, 2=5505, 3=5509
80124	LITTLETON	DOUGLAS					5506
80125	LITTLETON	DOUGLAS	JEFFERSON			5031	1=5506, 2=5509
80126	LITTLETON	DOUGLAS					5506
80127	LITTLETON	JEFFERSON					5509
80128	LITTLETON	JEFFERSON					5509
80129	LITTLETON	ARAPAHOE	DOUGLAS			5019	1=5501, 2=5506
80130	LITTLETON	DOUGLAS					5506
80131	LOUVIERS	DOUGLAS					5506
80134	PARKER	DOUGLAS	ELBERT			5030	1=5506, 2=5507
80135	SEDALIA	DOUGLAS					5506
80136	STRASBURG	ADAMS	ARAPAHOE			5008	1=5500, 2=5501
80137	WATKINS	ADAMS	ARAPAHOE			5008	1=5500, 2=5501
80138	PARKER	ARAPAHOE	DOUGLAS	ELBERT		5018	1=5501, 2=5506, 3=5507
80150	ENGLEWOOD	ARAPAHOE					5501
80151	ENGLEWOOD	ARAPAHOE					5501
80155	ENGLEWOOD	ARAPAHOE					5501
80160	LITTLETON	ARAPAHOE					5501
80161	LITTLETON	ARAPAHOE					5501
80162	LITTLETON	JEFFERSON					5509
80163	LITTLETON	DOUGLAS					5506
80165	LITTLETON	ARAPAHOE					5501
80166	LITTLETON	ARAPAHOE					5501
80201	DENVER	DENVER					5505
80202	DENVER	DENVER					5505
80203	DENVER	DENVER					5505
80204	DENVER	DENVER					5505
80205	DENVER	DENVER					5505
80206	DENVER	DENVER					5505
80207	DENVER	DENVER					5505
80208	DENVER	DENVER					5505
80209	DENVER	DENVER					5505
80210	DENVER	DENVER					5505
80211	DENVER	DENVER					5505
80212	DENVER	ADAMS	DENVER	JEFFERSON		5012	1=5500, 2=5505, 3=5509
80214	DENVER	DENVER	JEFFERSON			5029	1=5505, 2=5509
80215	DENVER	JEFFERSON					5509
80216	DENVER	ADAMS	DENVER			5010	1=5500, 2=5505
80217	DENVER	DENVER					5505
80218	DENVER	DENVER					5505
80219	DENVER	DENVER					5505
80220	DENVER	DENVER					5505
80221	DENVER	ADAMS	DENVER			5010	1=5500, 2=5505
80222	DENVER	ARAPAHOE	DENVER			5016	1=5501, 2=5505
80223	DENVER	DENVER					5505

Announcements

Announcements	
Greeting Announcement 5026:	"Thank you for calling the Point of Distribution Assistance Line." (repeat message in Spanish)
Greeting Announcement 5027:	"To proceed in English, press 1. <i>To proceed in Spanish, please press 2.</i> " (<i>Italics in Spanish</i>)
Collect 5 Digits Announcement 5028:	"This is an automated service to identify how to obtain the medications currently being dispensed in the Denver Metropolitan area by public health agencies for disease prevention. If you live or work in the Denver Metropolitan Area by using a touch tone phone, please enter your five digit zip code. "
Out of Area Zip Code Announcement 5024:	"The zip code you have provided is not within the affected area and you will not need to take any medications at this time. By entering the area where drugs are being distributed, you may needlessly increase your chance of exposure. Please understand that public health agencies are getting drugs to people with the highest likelihood of exposure first. Giving drugs to people who do not need them will slow down the distribution process. If you feel that you may still have been exposed, please wait on the line for the first available information provider to assist you. Otherwise please hang up."
In Area Zip Code Announcement 5022:	"The zip code you have provided is within the affected area and you may need to take antibiotics to prevent illness. The following are instructions to receive your medications for you and your family members."
Special USPS Announcement 5023 (Broomfield 80020 only):	"People in this zip code will be having medications delivered to their homes by the US Postal Service. These drugs will arrive in the next 24-48 hours. You will not need to do anything else but wait for their arrival. If after this amount of time you have not received your medications or if you need additional medications, please contact Broomfield Public Health at 303-XXX-XXXX."
5002:	"Please hold while I transfer your call."
5004:	"Thank you for calling. Goodbye."
5007:	"Sorry we can no longer process your call."
5011:	"You will need to speak to an information Provider."
5015:	"Press 1 to repeat this this information, press 9 to end the call."
5035:	"To repeat this message press #, to enter a new zip code press 9."

POD Messages by County 1

County	County Messages (for any zip code within that county)	Zip Codes entirely within:	Zip Codes that cross into:
Adams	5500: Your zip code indicates you are in Adams County. Tri County Health Department officials are distributing antibiotics to the Adams County population at Blake Community College, located at 1234 West 100th Avenue in Blake. This location is between Pena and Sheridan Boulevards on West 100th Avenue. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message.	80019, 80022, 80024, 80030, 80035, 80036, 80037, 80040, 80042, 80045, 80229, 80233, 80241, 80260, 80601, 80602, 80603, 80614, 80640, 80642, 80643, 80654, 80701	80003, 80010, 80011, 80020, 80031, 80101, 80102, 80105, 80136, 80137, 80212, 80216, 80221, 80230, 80234, 80247, 80249
Arapahoe	5501: Your zip code indicates you are in Arapahoe County. Tri County Health Department Officials are distributing antibiotics to the Arapahoe County population at Lionsville High School, located at 2743 South Maple Street in Lionsville. This location is four blocks east of South Pennsylvania and Highland Avenue. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message.	80012, 80013, 80015, 80016, 80017, 80018, 80041, 80044, 80046, 80047, 80103, 80111, 80113, 80121, 80122, 80150, 80151, 80155, 80160, 80161, 80165, 80166, 80233	80010, 80011, 80014, 80012, 80105, 80110, 80112, 80120, 80123, 80129, 80136, 80137, 80138, 80222, 80231, 80236, 80247
Boulder	5502: Your zip code indicates you are in Boulder County. Boulder County Health Department Officials are distributing antibiotics to the Boulder County Population at Emmitsville High School, located at 8725 Jeannie Road in Emmitsville. This location is on the corner of Fresno Street and Jeannie Road, after Highway 119 becomes Jeannie Road. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message.	80025, 80026, 80027, 80028, 80038, 80301, 80302, 80303, 80304, 80305, 80306, 80307, 80308, 80309, 80310, 80314, 80321, 80322, 80323, 80328, 80329, 80455, 80466, 80471, 80481, 80501, 80502, 80503, 80504, 80510, 80513, 80516, 80533, 80540, 80544	80020, 80403
Broomfield	5503: Your zip code indicates you are in Broomfield County. Broomfield Health and Human Services Officials are distributing antibiotics to the Broomfield County population at the Broomfield County Fairgrounds, located at 234 Presston Street in Broomfield. This location is one block east of Main Street and East 8th Avenue. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message.	No zips entirely in Broomfield County	80020, 80021, 80234 Note: 80020 will get special message 5023 about USPS delivery
Clear Creek	5504: Your zip code indicates you are in Clear Creek County. The Clear Creek County Public Health Nursing Service is distributing antibiotics to the Clear Creek County population at Westminster Middle School, located at 234 Highway 103 in Westminster. This location is south of Interstate 70 and Highway 9 on Highway 107. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message.	80436, 80438, 80444, 80452, 80476	80439

County	County Messages (for any zip code within that county)	Zip Codes entirely within:	Zip Codes that cross into:
Denver	5505: Your zip code indicates you are in Denver County. Denver Public Health Officials are distributing antibiotics to the Denver County population at the Denver Metroplex, located at 1653 E. Washington in Denver. This location is five blocks east of Bannock and Louisiana. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message.	80201, 80202, 80203, 80204, 80205, 80206, 80207, 80208, 80209, 80210, 80211, 80217, 80218, 80219, 80220, 80223, 80224, 80237, 80238, 80239, 80243, 80244, 80246, 80248, 80250, 80251, 80252, 80255, 80256, 80257, 80259, 80261, 80262, 80263, 80264, 80265, 80266, 80270, 80271, 80273, 80274, 80275, 80279, 80280, 80281, 80285, 80290, 80291, 80292, 80293, 80294, 80295, 80299	80014, 80110, 80112, 80123, 80212, 80214, 80216, 80221, 80222, 80226, 80227, 80231, 80232, 80235, 80236, 80247, 80249
Douglas	5506: Your zip code indicates you are in Douglas County. Tri County Health Department Officials are distributing antibiotics to the Douglas County population at Our Lady of Loretto High School, located at 3448 Walker Drive in Castle Rock. This location is south of the intersection of Highway 47 and Front Street. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message. You may push # to repeat this message.	80104, 80108, 80109, 80116, 80118, 80124, 80126, 80130, 80131, 80135, 80163	80106, 80112, 80120, 80125, 80129, 80134, 80138
Elbert	5507: Your zip code indicates you are in Elbert County. Elbert County Health Department Officials are distributing antibiotics to the Elbert County population at Kiowa Elementary School, located at 563 Pawnee Avenue in Kiowa. This location is north on Ute Avenue from Suwanee Street. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours. You may push # to repeat this message.	80107, 80117, 80808, 80828, 80830, 80831, 80832, 80833, 80835	80101, 80102, 80106, 80134, 80138
Gilpin	5508: Your zip code indicates you are in Gilpin County. Jefferson County Health Department Officials are distributing antibiotics to the Gilpin County population at the Coors Memorial High School, located at 234 Highland Ave in Golden. This location is south on Highland from Golden Gate Canyon Road. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours.	80422, 80427, 80474	80403
Jefferson	5509: Your zip code indicates you are in Jefferson County. Jefferson County Health Department Officials are distributing antibiotics to the Jefferson County population at Dinasaar Ridge Middle School, located at 1118 NW 41st Ave in Golden. This location is southwest of Highway 6 and Parson Street on 41st Avenue. All Points of Distribution are well stocked with plenty of medications for everyone, and all Points of Distribution are open 24 hours.	80001, 80002, 80004, 80005, 80006, 80007, 80033, 80034, 80127, 80128, 80162, 80215, 80225, 80228, 80401, 80402, 80419, 80425, 80433, 80437, 80453, 80454, 80457, 80465, 80470	80003, 80020, 80021, 80031, 80123, 80125, 80212, 80214, 80226, 80227, 80232, 80235, 80439

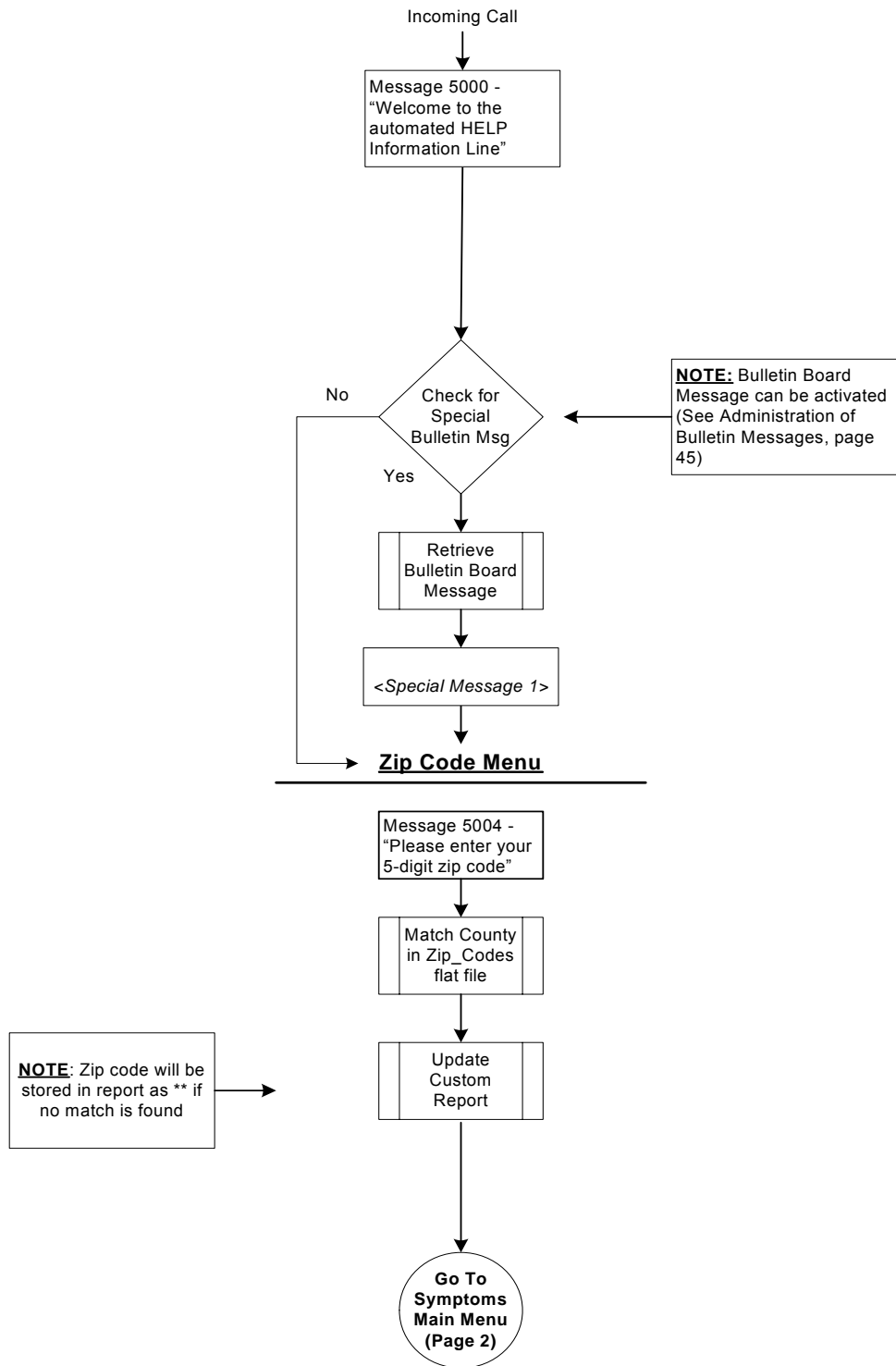
Cross County Announcements

Cross County Announcements	Specific County Info Message
5034 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Arapahoe County, press 2. If you live in Denver County, press 3."	1=5500, 5=5501, 3=5505
5033 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Arapahoe County, press 2. If you live in Elbert County, press 3."	1=5500, 2=5501, 3=5507
5008 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Arapahoe County, press 2."	1=5500, 2=5501
5005 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Broomfield County, press 2. If you live in Boulder County, press 3. If you live in Jefferson County, press 4."	1=5500, 2=5502, 3=5023, 4=5509
5009 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Broomfield County, press 2."	1=5500, 2=5503
5012 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Denver County, press 2. If you live in Jefferson County, press 3."	1=5500, 2=5505, 3=5509
5010 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Denver County, press 2."	1=5500, 2=5505
5013 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Elbert County, press 2."	1=5500, 2=5507
5006 "You have entered a zip code which crosses into more than one county . If you live in Adams County, press 1. If you live in Jefferson County, press 2."	1=5500, 2=5509
5014 "You have entered a zip code which crosses into more than one county . If you live in Arapahoe County, press 1. If you live in Denver County, press 2. If you live in Douglas County, press 3."	1=5501, 2=5505, 3=5506
5032 "You have entered a zip code which crosses into more than one county . If you live in Arapahoe County, press 1. If you live in Denver County, press 2. If you live in Jefferson County, press 3."	1=5501, 2=5505, 3=5509
5016 "You have entered a zip code which crosses into more than one county . If you live in Arapahoe County, press 1. If you live in Denver County, press 2."	1=5501, 2=5505
5018 "You have entered a zip code which crosses into more than one county . If you live in Arapahoe County, press 1. If you live in Douglas County, press 2. If you live in Elbert County, press 3."	1=5501, 2=5506, 3=5507
5019 "You have entered a zip code which crosses into more than one county . If you live in Arapaho County, press 1. If you live in Douglas county, press 2."	1=5501, 2=5506
5020 "You have entered a zip code which crosses into more than one county . If you live in Boulder County, press 1. If you live in Gilpin County, press 2."	1=5502, 2=5508
5021 "You have entered a zip code which crosses into more than one county . If you live in Broomfield County, press 1. If you live in Jefferson County, press 2."	1=5503, 2=5509
5025 "You have entered a zip code which crosses into more than one county . If you live in Clear Creek County, press 1. If you live in Jefferson County, press 2."	1=5504, 2=5509
5029 "You have entered a zip code which crosses into more than one county . If you live in Denver County, press 1. If you live in Jefferson County, press 2."	1=5505, 2=5509
5030 "You have entered a zip code which crosses into more than one county . If you live in Douglas County, press 1. If you live in Elbert County, press 2."	1=5506, 2=5507
5031 "You have entered a zip code which crosses into more than one county . If you live in Douglas County, press 1. If you live in Jefferson County, press 2."	1=5506, 2=5509

4.4. Frequently Asked Question (FAQ) Library Application

The FAQ Library application will disseminate up-to-date, consistent, and accurate information approved by health department epidemiologists to the public and health care providers from a searchable library of FAQs. Callers dialing into this application should be able to select desired information with discernable directions from the application including maneuverability throughout the menus. Also, callers should have the ability to select an option to speak with an Information Provider, if needed. The application will provide reports on how many callers selected all message options. Callers dialing into this application will hear the initial greeting then will hear a special bulletin announcement if recorded prior to being prompted for their zip code. The special greeting announcement is built into the application so emergency or seasonal announcements can be easily changed by an administrator dialing in with a special access code and selecting the appropriate announcement.

Initial Menu



Note: /set Conv_data
field = "0" indicating caller
reached Main Menu but
did not select a Topic

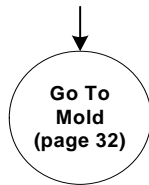
Symptoms - Main Menu

Message 5006=For information about West Nile Virus, press 1.
Message 5007=For information about Mold, press 2.
Message 5008=For information about Hantavirus, press 3.
Message 5009=For all other topics press 4

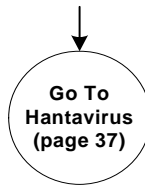
1
West Nile Virus



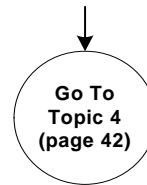
2
Mold



3
Hantavirus

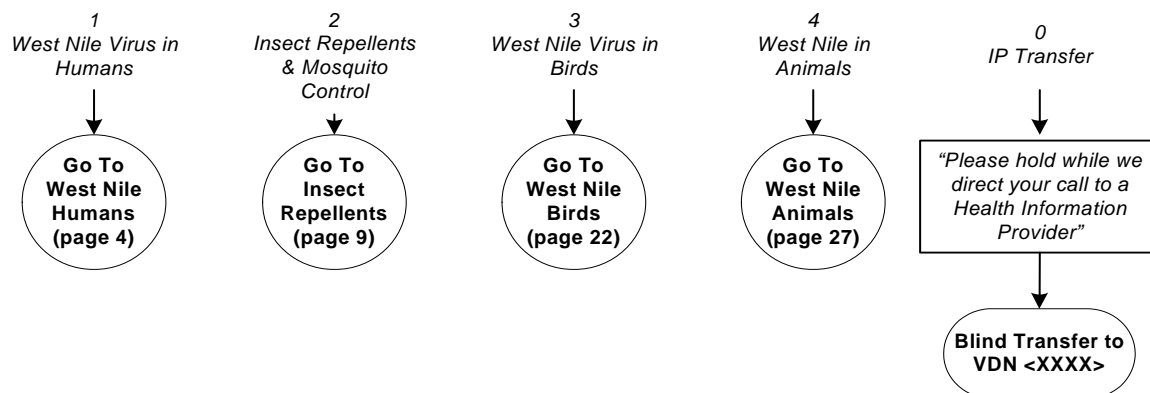


4
All Other Topics



West Nile Virus

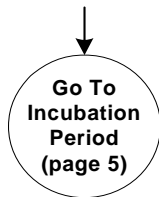
Message 5011=For information about WNV in humans press 1.
Message 5012=For information about insect repellents and mosquito control press 2.
Message 5013=For information about WNV in birds press 3.
Message 5014=For information about WNV in other animals including pets press 4.
Message 5015=You may speak to a Health Information Provider at any time by pressing 0.



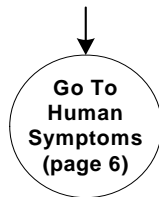
West Nile Humans

Message 5027=For information about the incubation period of WNV press 1.
Message 5028=For information about the symptoms of WNV press 2.
Message 5029=For information about WNV and immunity to future infection press 3.
Message 5030=For information about tests press 4.

1
Incubation Period



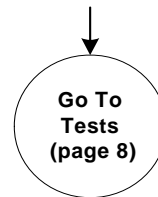
2
Human Symptoms



3
Future Immunity



4
Tests



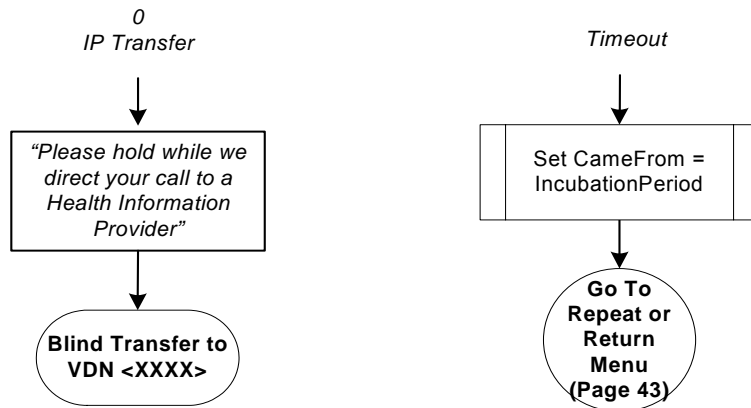
Incubation Period

Message 5031

The incubation period is usually 3 to 14 days for West Nile Virus. Once bitten by a mosquito there is no way to prevent getting the virus. The best protection is prevent getting mosquito bites in the first place by wearing insect repellent containing DEET.

A mosquito bite that is red and swollen does not mean that it is more likely to be from an infected mosquito. It is the a result of your body's allergic reaction to the mosquito's saliva, which was injected into you when you were bitten.

Most mosquitoes are not infected, so it is unlikely that the mosquito that bit you was capable of transmitting the virus. No action should be taken unless you develop symptoms.



Human Symptoms

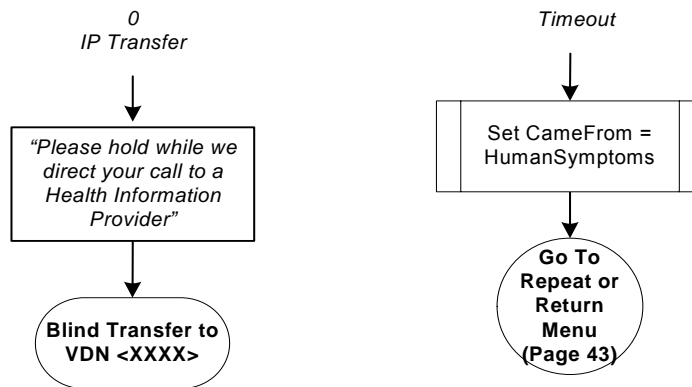
Message 5032

80% of people who become infected with West Nile Virus will not develop any symptoms.

20% will develop West Nile fever: fever, headache, and body aches. Occasionally, the person will develop a skin rash on the trunk of the body and swollen lymph glands. This illness lasts several days and person gets better without any treatment.

1 in 150 persons that get infected with WNV will develop a more severe form of the disease.

The symptoms include headaches, high fever, neck stiffness, muscle weakness or tremors, stupor, disorientation, coma, convulsions and paralysis. This can cause permanent brain damage or death. If you are experiencing these more severe symptoms you should see your medical provider.



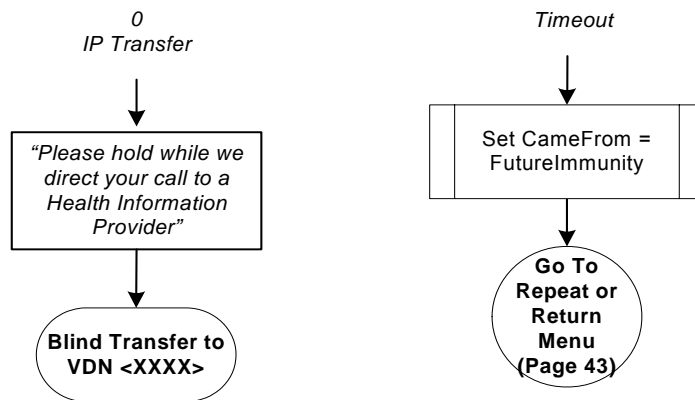
Future Immunity

Message 5033

If you have been tested positive for having had WNV, it is assumed immunity will be life-long; however, it may wane in later years.

If you were not tested for WNV, then you should consider yourself susceptible and take precautions. There are hundreds of viruses that circulate in the state and can cause identical symptoms. Thus you can not accurately diagnose WNV infection by symptoms or history of mosquito bites. It requires a blood test.

Also other mosquito-borne viruses are out there, although fairly rare. The bottom line is take precautions if mosquitoes are biting you.



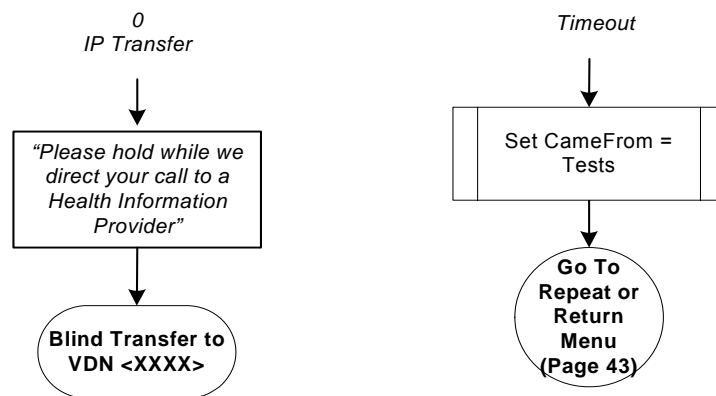
Tests

Message 5034

If you develop symptoms such as high fever, confusion, muscle weakness, and severe headaches, you should see your doctor. Your doctor can order any tests he/she feels are necessary.

Your physician will draw a blood sample and send it to a commercial or public health laboratory for testing.

The WNV tests are effective and accurate. The WNV tests are effective and accurate. Initial tests are usually followed with back-up tests to confirm WNV infection.



Insect Repellents

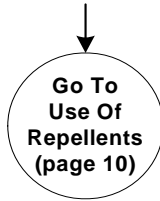
Message 5035 = For information about Insect Repellents and their use press 1.

Message 5036 = For information about Mosquito breeding habitats press 2.

Message 5037 = For information about larvacide press 3.

Message 5038 = For all other information about mosquitoes press 4.

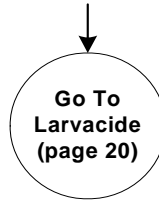
1
Use of repellents



2
Breeding Habitats



3
Larvacide



4
Mosquitoes all
other



Use of Repellents

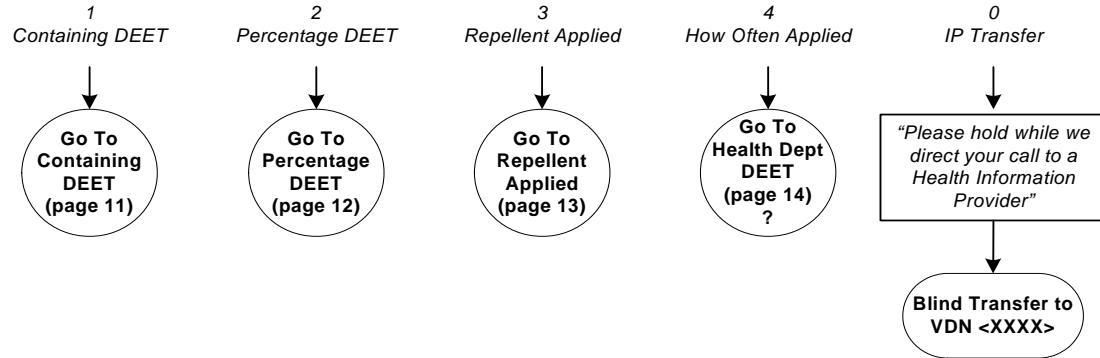
Message 5038 = For information about insect repellent containing DEET and its use with infants and children press 1.

Message 5039 = For information the about protection time and percentage of DEET press 2.

Message 5040 = For information how often insect repellent should be applied press 3.

Message 5041 = For information about how often insect repellent should be applied press 4.

Message 5015 = You may Speak to a Health Information provider at any time by pressing 0.



Containing DEET

Message 5042

According to the Academy of Pediatrics, repellents containing 10% to 30% DEET can be used for children 2 mos. Infants should be kept away from mosquitoes.

Apply it to your own hands and then run them on your child.

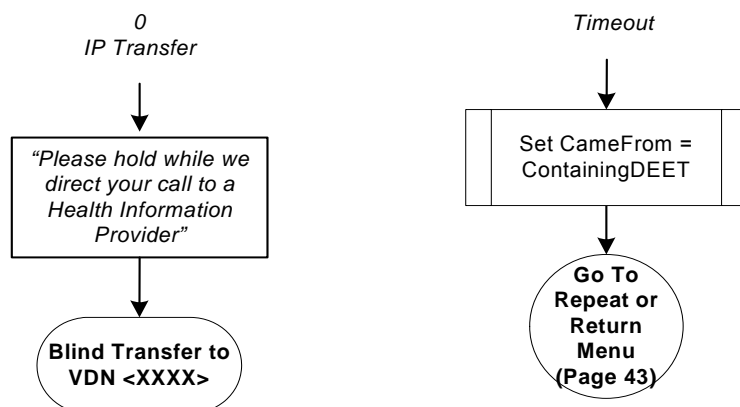
Avoid children's eyes and mouth and use it sparingly around their ears.

Do not apply repellent to children's hands. Children may put their hand in their mouths.

Do not allow young children to apply insect repellent to themselves. Have an adult do it for them.

Keep repellents out of reach of children.

Do not apply repellent to skin under clothing. If repellent is applied to clothing, wash treated clothing after use.



Percentage DEET

Message 5043

You want to choose a repellent that provides the maximum amount of protection for the amount of time that you will be outdoors. A higher percentage of DEET should be used if you are will be outdoors for several hours while a lower percentage of DEET can be used if time outdoors will be limited.

A product containing 23.8% DEET will provide an average of 5 hours of protection from mosquito bites.

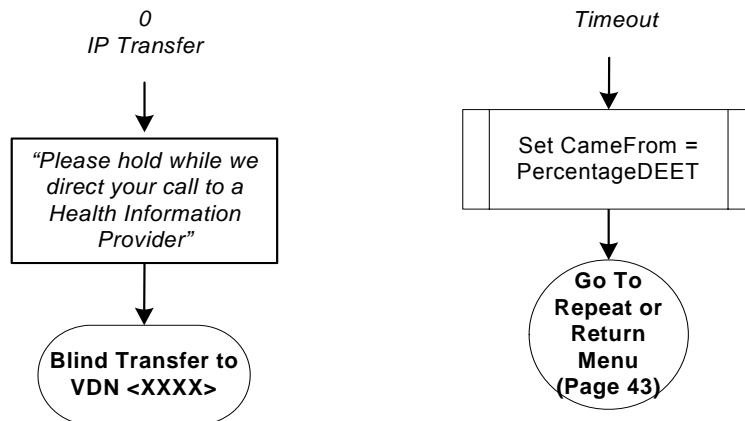
A product containing 20% DEET will provide an average of 4 hours of protection.

A product with 6.65% DEET will provide an average of 2 hours of protection.

Products with 4.75% DEET and 2% Soybean oil are both able to provide roughly 1 and half hours protection.

Option to return to main menu, option to return to topics or option to speak to a Health Information Provider.

Virus will not develop any symptoms.



Repellent Applied

Message 5044

You want to choose the repellent that provides the maximum amount of protection for the amount of time that you will be outdoors. A higher percentage of DEET should be used if you will be outdoors for several hours while a lower percentage of DEET can be used if the outdoors will be limited.

A product containing 23.8% DEET will provide an average of 5 hours of protection from mosquito bites.

A product containing 20% DEET will provide an average of 4 hours of protection from mosquito bites.

A product with 6.65 % DEET will provide an average of 2 hours of protection from mosquito bites.

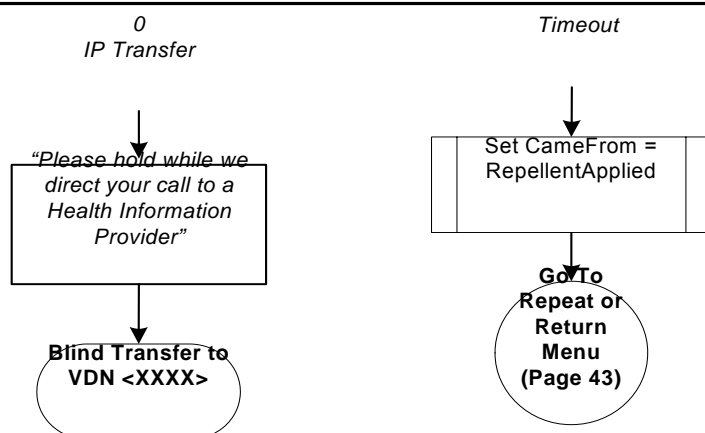
Products with 4.75% DEET and 2% soybean oil were both able to provide roughly 1 and 1 half hours of protection.

Sweating, swimming, or getting wet can wash off repellent so reapplication of the repellent may be needed.

If you are not being bitten, it is not necessary to re-apply repellent.

Concentrations above 30% do not provide extra protection.

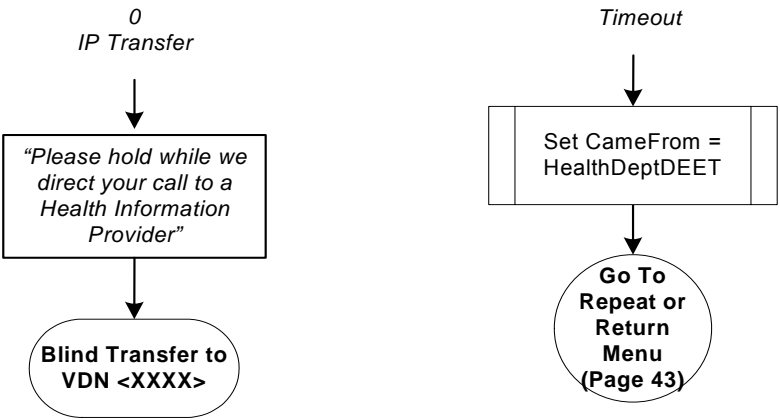
You may speak to a Health Information provider at any time by pressing 0.



Health Dept DEET

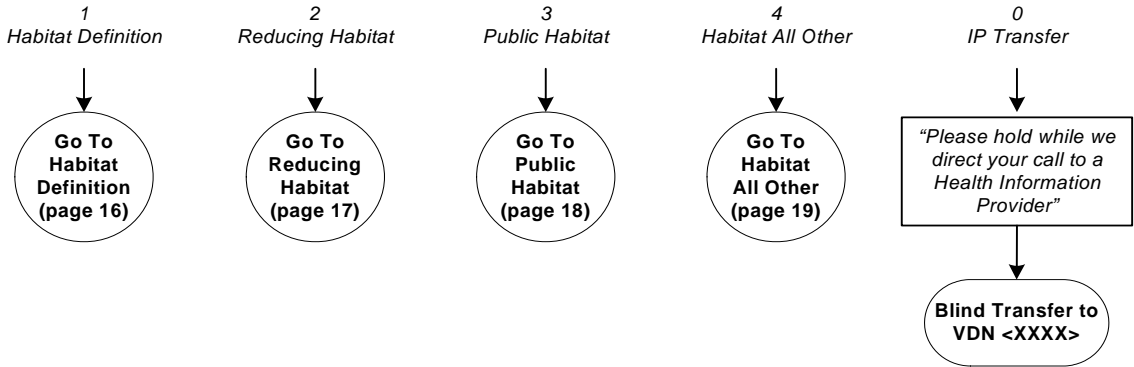
Message 5046

*The Health Dept. recommends repellents with DEET because it is the most studied and most effective insect repellent available. Non-DEET repellents product do provide some protection from mosquito bites. Studies show that these products do not provide the same level or length of protection.
A soybean-oil based product has been shown to provide some protection for a period of time similar to a product with a low concentration of DEET (4.75%).*



Breeding Habitats

Message 5047 = For information on what is a mosquito breeding habitat press 1.
Message 5048 = For information on how you can reduce mosquitoes on your property press 2.
Message 5049 = For information about the breeding habits on public property or someone else's property press 3.
Message 5050 = For all other information about mosquito breeding habitats press 4.
Message 5015 = You may speak to a Health Information Provider at any time by pressing 0.

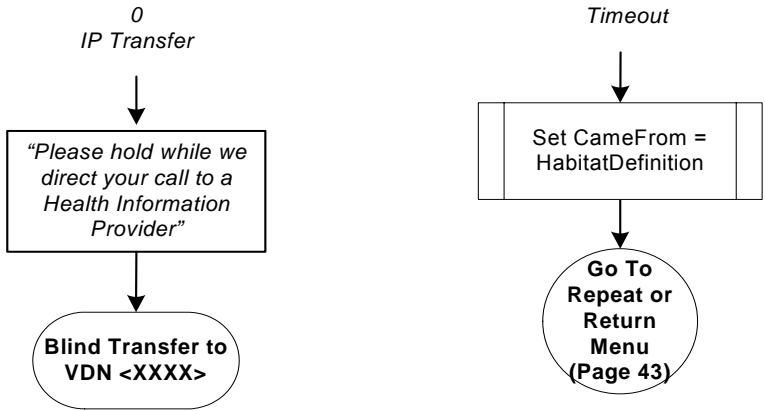


Habitat Definition

Message 5051

Anything that can hold standing water for 4 to 7 days is a mosquito breeding habitat. For example, flower pots, pet food and water dishes, birdbaths, swimming pool covers, buckets, barrels, cans, clogged rain gutters, discarded tires, wheelbarrows, leaky air conditioner hoses, tarps, plastic garden sheeting, ponds, ditches, plant saucers, puddles, equipment, barbecue grills, toys, boats, canoes, and trash.

Any container that can hold water should be emptied at least every 4 to 7 days.



Reducing Habitat

Message 5052

Empty containers that hold water, such as bird baths or plant saucers every 4 to seven days.

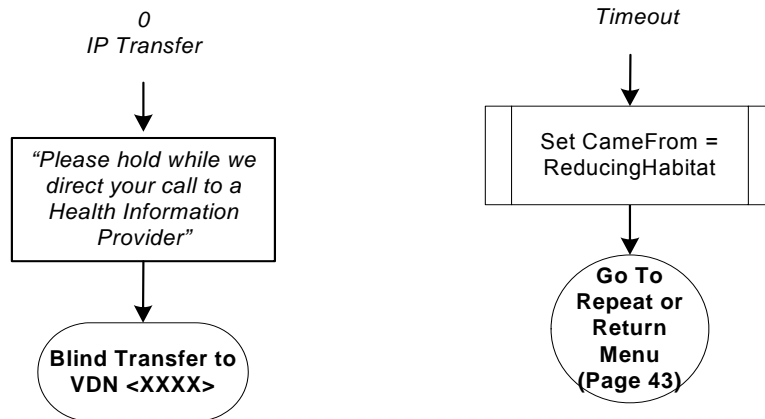
Stock your ponds with mosquito eating fish such as Koe or Fathead minnows which can be purchased commercially at private fish hatcheries.

These fish are only recommended for ornamental ponds that do not empty into natural streams or other bodies of water.

For ponds that empty into natural waters, contact the Division of Wildlife District office in your area to see what types of fish, like trout, are acceptable in your area.

Use larvacide in your pond. Several larvacide options exist.

Remove excess vegetation around the pond perimeter which mosquito larvae use for shelter.

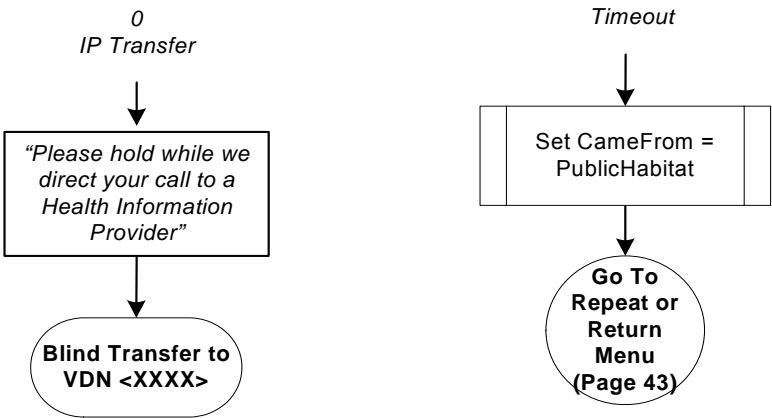


Public Habitat

Message 5053

Mosquito-breeding sites, such as large areas of standing water, can be reported to the mosquito control program or local health department in your area.

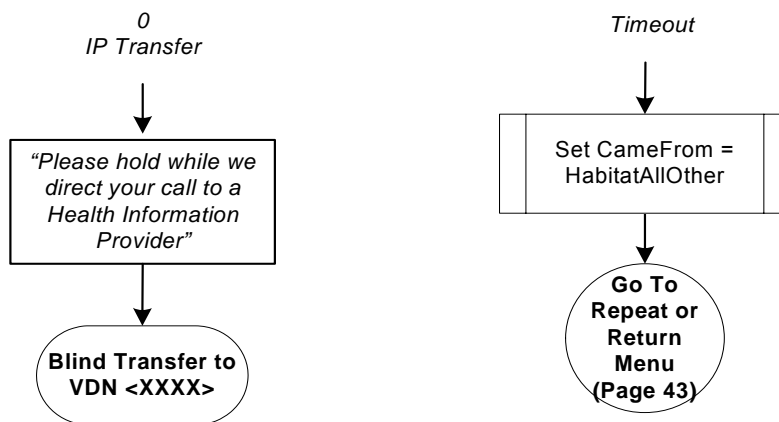
Mosquito Control programs must follow rules and regulations regarding where and what type of mosquito control they can do. They may or may not be able to treat the site depending on whether it is within the control , district boundaries, on private property or in a protected area that cannot be treated.



Habitat All Other

Message 5054

To find more information about the Mosquito Control program in your area, go to www.fightthebitecolorado.com. Click on State Health Department West Nile Virus Homepage located on the right hand side of the page. Click on List of Commercial Pesticide Applicators in Colorado – under Professional Information and Resources and then Information for Local Health Departments. You will find your information there or you can press 0 and one of our Health Information Providers will assist you.



Larvacide

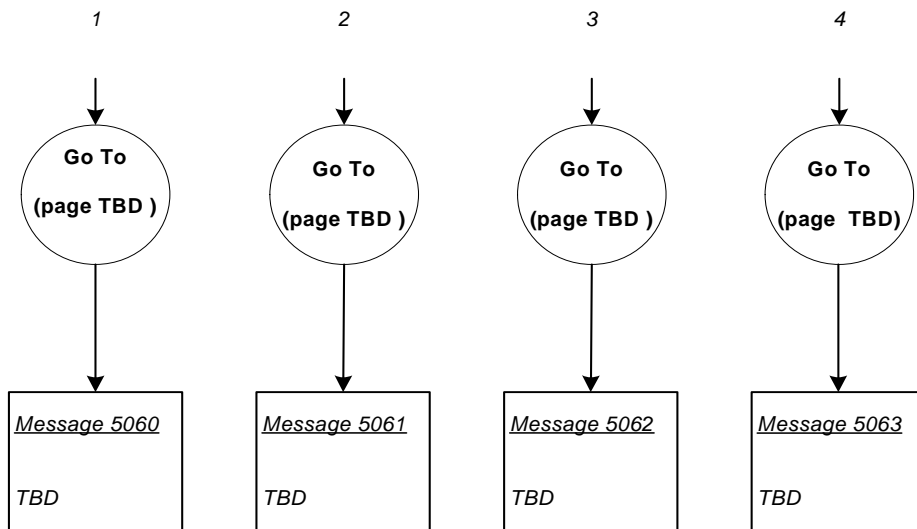
Note: This topic message is under development but up to 4 menu choices have been allocated to it (TBD = To Be Determined).

Message 5056 =

Message 5057 =

Message 5058 =

Message 5059 =



Mosquitoes All Other

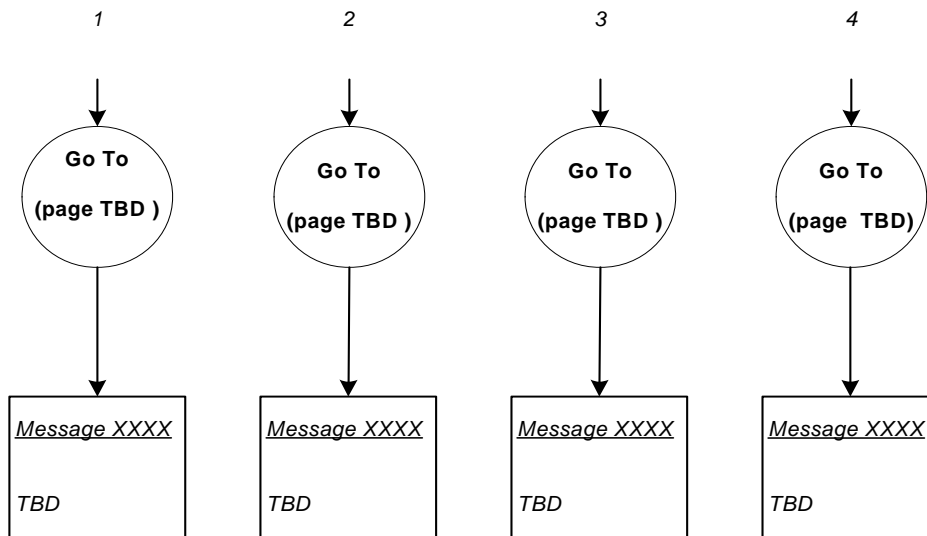
Note: This topic message is under development but up to 4 menu choices have been allocated to it (TBD = To Be Determined).

Message XXXX =

Message XXXX =

Message XXXX =

Message XXXX =



West Nile Birds

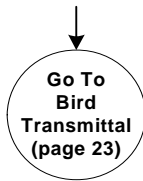
Message 5064 = For information about how birds get and transmit WNV press 1.

Message 5065 = For information about whether your bird bath or bird feeder is contributing to WNV in birds press 2.

Message 5066 = For information about symptoms a WNV infected bird will display press 3.

Message 5067 = For information about whether you will be exposed to the virus by handling a dead bird press 4.

1
Bird Transmittal



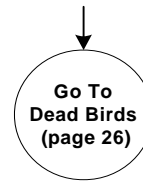
2
Bird Feeders



3
Bird Symptoms



4
Dead Birds



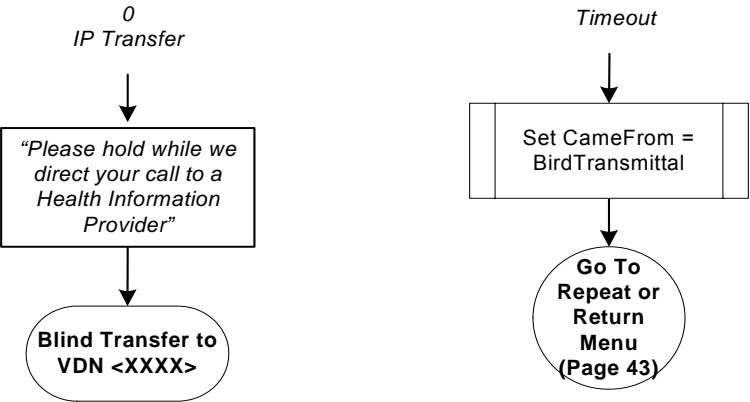
Bird Transmittal

Message 5068

First, mosquitoes acquire the virus when they feed on infected birds. The virus then starts replicating in the salivary glands of the infected mosquito. The mosquito then spreads the virus to other birds when the mosquito feeds.

It is also believed that scavenger birds, like crows and magpies, and raptors (eagles, hawks and owls) can be infected from eating infected animals.

Since birds do not become ill for several days, it is possible for them to travel a considerable distance and help spread the disease as other mosquitoes feed on them.



Bird Feeders

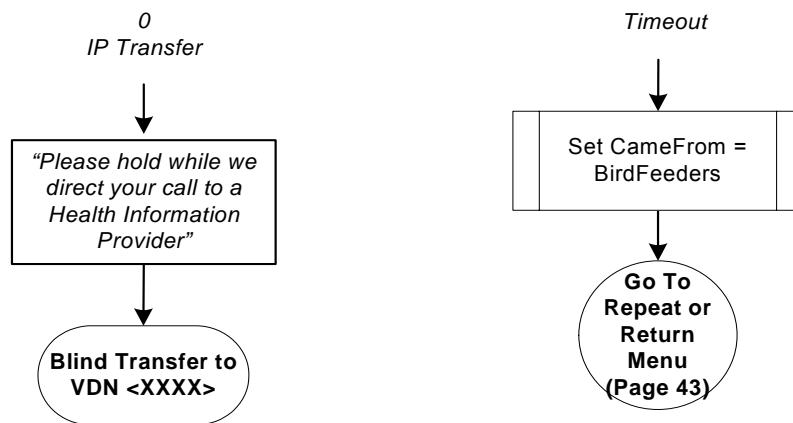
Message 5069

It is unknown whether WNV can be transmitted from bird feed or water contaminated with droppings from an infected bird.

There are other diseases, such as salmonella, that can be transmitted by contaminated bird feed and water. Feeding birds brings many birds into close contact and increases the risk of disease transmission.

Feeding should be reduced or stopped in the summer. If not, bird feeders and baths should be cleaned and disinfected at least every 5 to 7 days.

Bird excrement can be cleaned up with soap and water and then allowed to air dry. For surfaces that might come in contact with food, table tops, grills, and bird feeders a disinfectant should be applied after cleaning with soap and water. Be sure to wash hands after cleaning up any animal droppings or handling dead birds.



Bird Symptoms

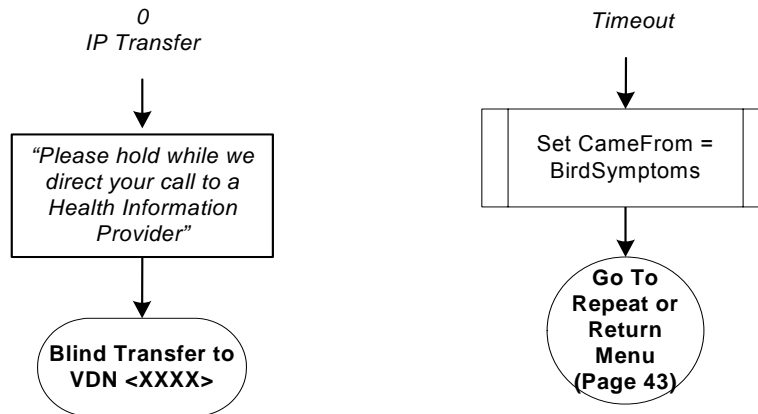
Message 5070

Over 225 species of birds in the United States have died due to WNV. Bird die-offs are an indicator of the virus circulating in the area. But, bird die-offs can be due to other diseases, such as salmonella.

Birds infected with WNV may be unable to fly, appear disoriented, stagger or be unbalanced, slow to move when approached or lying motionless.

Many things can cause similar symptoms in birds, only testing can tell if the bird is infected. There is no way to tell from if a bird died from WNV by looking at it. Only a lab test can tell.

The test can only be done on certain types of birds. However, the State Department of Health tracks all bird die-offs during West Nile Virus season. If you have found a dead bird please push 0 to speak with one of our Health Information Providers and file a Dead Bird Report.

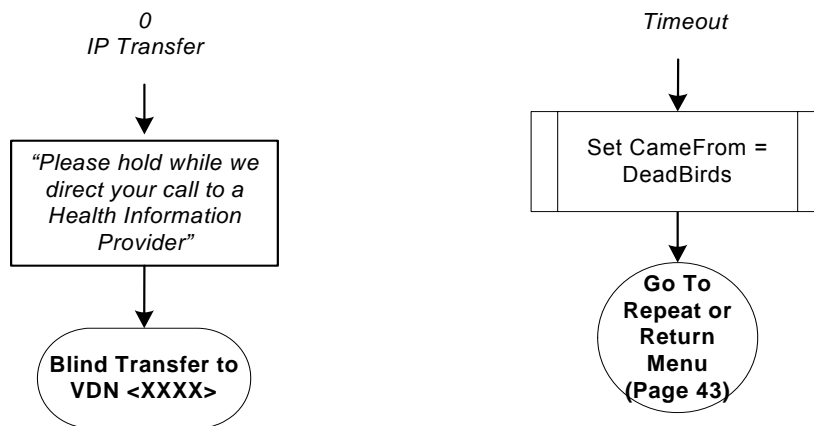


Dead Birds

Message 5071

There is no evidence that of the virus being transmitted directly from bird to human. However, persons should avoid contacting dead birds with their bare hands. Gloves, shovel, or plastic bags should be used to handle the carcasses.

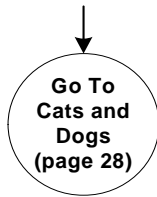
Three lab workers have been infected while dissecting infected bird carcasses for testing. In all three cases the lab workers suffered cuts or needle stick from contaminated scalpels or needles.



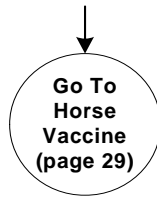
West Nile Animals

Message 5072 = For information about WNV and cats and dogs press 1.
Message 5073 = For information about horse vaccine press 2.
Message 5074 = For information about vaccination and foals press 3.
Message 5075 = For information about horse symptoms and testing press 4.

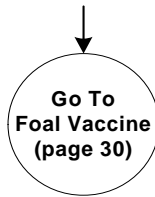
1
Cats and Dogs



2
Horse Vaccine



3
Foal Vaccine



4
Horse Symptoms



Cats and Dogs

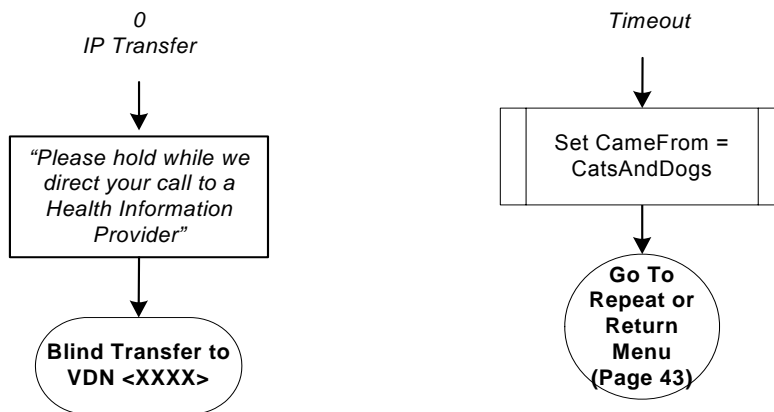
Message 5076

WNV in pets is probably common but actual illness in dogs and cats is very rare. Dogs and cats can get the virus from a mosquito but it is extremely unlikely that that your dog or cat will develop a disease from WNV.

If your pet does is ill, contact your veterinarian.

You can protect your pet from mosquitoes by bringing it indoors during dawn and dusk when mosquitoes are actively feeding.

If you are going to use insect repellent on your animals, consult your veterinarian first. Make sure the insect repellent is safe for use on animals. Insect repellent and bringing them indoors will prevent other diseases besides WNV.



Horse Vaccine

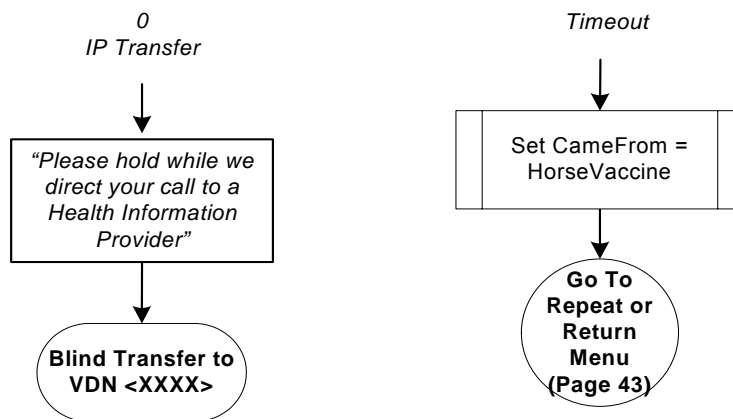
Message 5077

WNV is very dangerous for horses. Once a horse becomes ill about one third of the animals die or need to be put to sleep.

Fortunately, there is a vaccine for horses. Get them vaccinated for WNV. The vaccine series consists of two doses of vaccine 3-6 weeks apart, then annual boosters. The vaccine is 94% effective. 94 out of 100 horses will be protected from illness if infected.

Check with local veterinarians to get the vaccine. It should be administered in early spring.

Prevent exposure to mosquitoes. Reduce mosquito breeding areas, keep animals in screened stalls during mosquito-feeding times. Use air curtains in barns and stalls to keep flying insects out, conduct mosquito control.

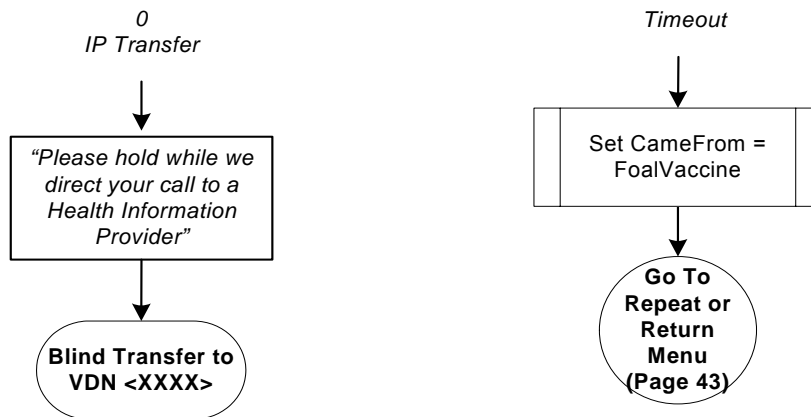


Foal Vaccine

Message 5078

In high-risk areas, foals born from mares not previously vaccinated, may be vaccinated beginning at 6-8 weeks of age. If the mare did receive the vaccine prior to foaling, it is recommended starting at 3 to 4 months of age.

In low risk areas, foals from vaccinated mares may be started a 5–7 months of age, while foals from non-vaccinated mares can be started at 3 to 4 months of age.



Horse Symptoms

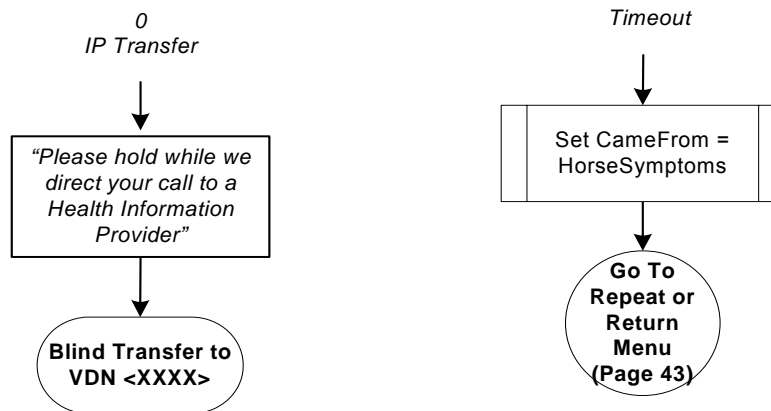
Message 5079

Infected horses show symptoms of that include a lack of coordination, stumbling, weakness of limbs, muscle tremors or paralysis. If you notice symptoms you should consult your veterinarian.

A simple blood test is used to determine if the horse has been infected WNV. The specific test is an ELISA IgM antibody capture. ELISA stands for enzyme linked immunoosorbent assay.

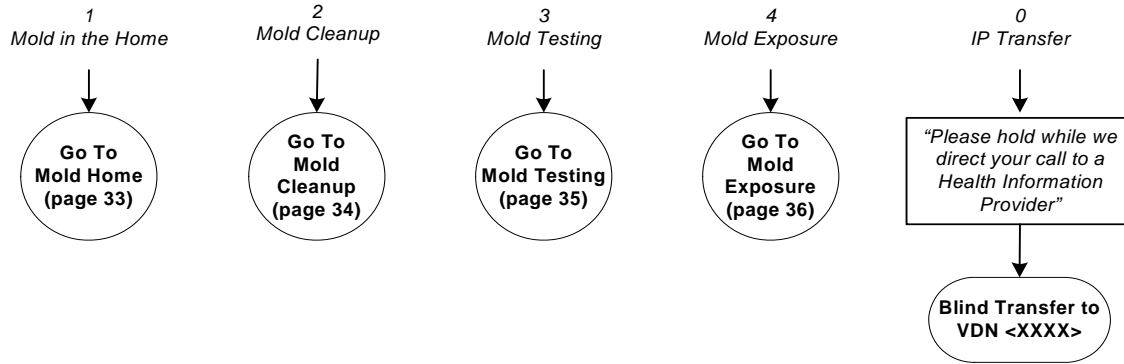
The test is very accurate in detecting infections. Normally the test will be positive within 1 to 2 days of the animal becoming ill.

Treatment for a WNV infected horse includes supportive care consistent with standard veterinary practices for animals with viral infections.



Mold

*Message 5016 = For general information about mold in the home press 1,
Message 5017 = For information about how to clean up mold press 2,
Message 5018 = For information about testing for mold press 3,
Message 5019 = For information about symptoms of mold exposure press 4,
Message 5015 = You may speak to a Health Information Provider at any time by pressing 0.*



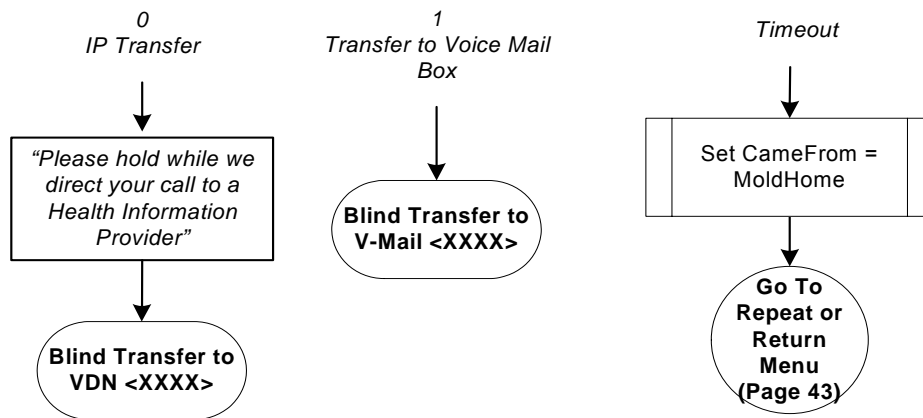
Mold Home

Message 5080

There is always some level of mold and the amount varies by location. Molds enter your home through doorways, windows, ventilation systems or they are carried into the home by being attached to a person or object.

Molds will grow whenever conditions are right. They require moisture and organic material in order to grow and gradually destroy whatever they grow on by digesting the material.

The Colorado Department of Public Health and Environment has Mold Informational materials that can be mailed to you. If you would like these mailed to you please press 1; if you would like to speak with one of our health information provider, press 0.



Mold Cleanup

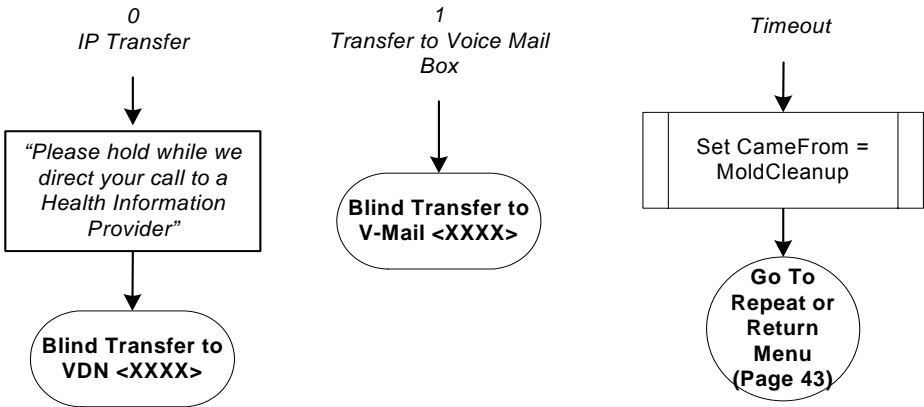
Message 5081

If you can see or smell mold, you likely have a problem and should take steps to clean your home for mold.

Whether you can clean the mold yourself or need to hire a contractor depends on the size of the problem. Small areas, usually less than 10 feet by 10 feet, may be able to be handled by the homeowner or maintenance staff using personal protective equipment. For larger areas, it is advisable that an experienced professional contractor be used.

Non-porous moldy items can be cleaned using protective equipment such as gloves, a mask, and eye protection. Porous items such as sheetrock, carpeting, and wood, needs to be removed.

The Colorado Department of Public Health and Environment has Mold Clean-Up Informational materials that can be mailed to you. If you would like these mailed to you please press 1; if your would like to speak with one of our health information provider press 0.



Mold Exposure

Message 5083

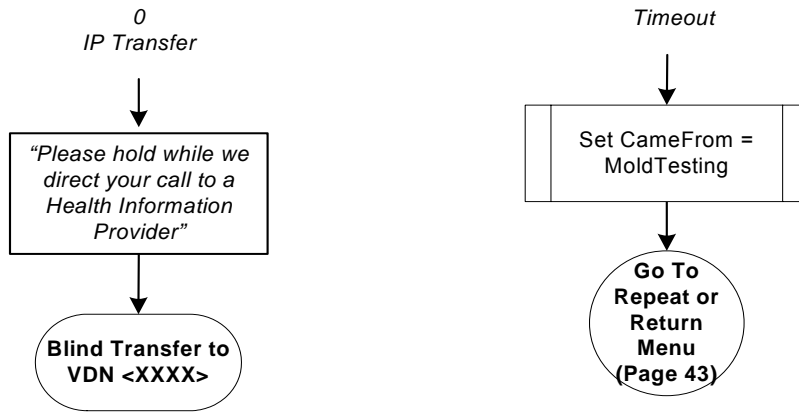
Daily exposure to some molds is common without necessarily causing harm. Mold spores can cause harm when they are present in large numbers and people inhale the spores.

For some people, a relatively small amount of mold spores can trigger an asthma attack or lead to other health problems. For others the symptoms may only occur when exposure levels are much higher. Children, especially infants less than one year, should not be exposed to moldy, water damaged environments.

Symptoms occur from inflammation, allergy or infection from molds. Allergic reactions are the most common and symptoms include:

- Respiratory problems, such as wheezing, difficulty breathing and a shortness of breath
- Nasal and sinus congestion
- Eye irritation
- Dry, hacking cough
- Nose or throat irritation
- Skin rashes or irritation

If you have been exposed to mold and are feeling sick, you should consult a medical professional. You should tell the physician about your symptoms and about when, how and for how long you were exposed.

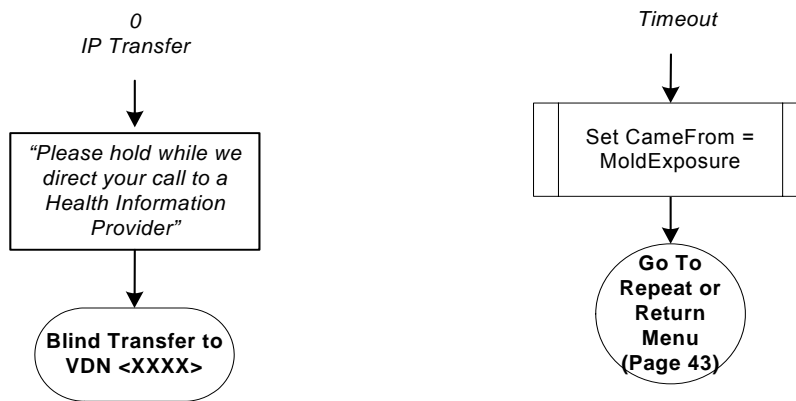


Mold Testing

Message 5082

The state does not provide testing services and public health agencies seldom provide the service. Going to private contractors to get your home tested as a first step is not recommended because air sampling for mold can be expensive. There are few available standards for judging what is an acceptable quantity of indoor molds.

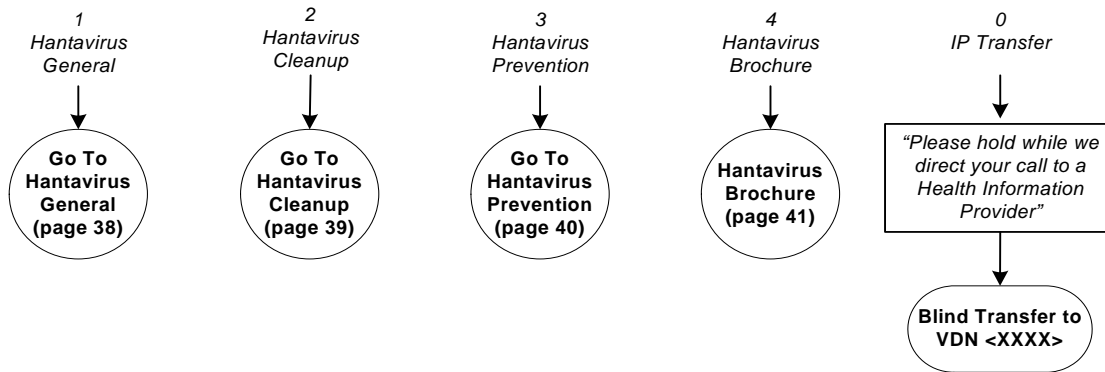
If you feel you are at the point you want to invest in air sampling you can find them in your local phone book. The State Department of Public Health and Environment has a listing of Contractors at www.cdphe.state.co.us/dc/envtox This list is not provided as an endorsement of these contractors. It is a listing of contractors who do mold testing in the state of Colorado.



Currently Disconnected

Hantavirus

*Message 5020 = For general information about Hantavirus disease and symptoms press 1,
Message 5021 = for information on how to clean up mouse nests and droppings safely press 2,
Message 5022 = for information of prevention of Hantavirus press 3
Message 5023 = to obtain a free brochure on Hantavirus press 4
Message 5015 = you may speak to a Health Information Provider at any time by pressing 0*



Hantavirus General

Message 5084

Hantavirus is a serious respiratory disease that is carried by certain rodents, primarily deer mice, and is passed to humans through contact with infected urine, droppings or saliva. It is extremely serious, with a high fatality rate.

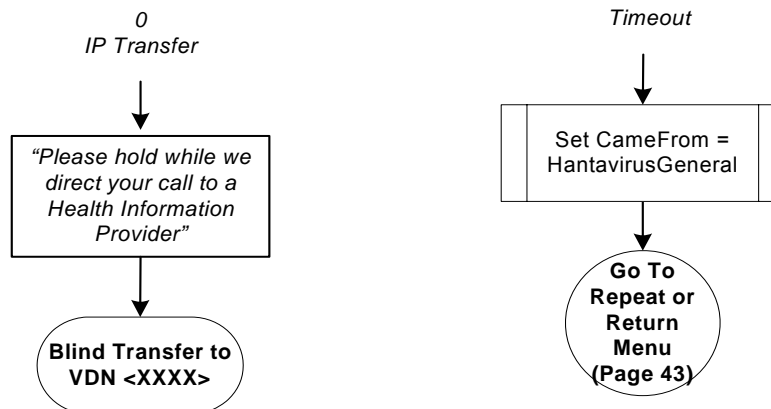
The incubation period varies widely, but ranges from 1-6 weeks, with an average of 1 -2 weeks.

The early symptoms include fever, headache, and muscle pain, severe abdominal, joint and lower back pain, nausea and vomiting.

A cough and shortness of breath usually develops 1 to 5 days after the onset of symptoms. The primary symptom of Hantavirus is difficulty in breathing due to fluid build-up in the lungs. This can quickly progress to respiratory failure.

Currently there is no effective drug treatment for Hantavirus. Early admission to the hospital where monitoring, treatment of symptoms, and good supportive therapy can be provided is important.

If you have had exposure to rodents and experience symptoms mentioned above, you should see your medical provider. It would be helpful to mention the exposure to your physician. A quick diagnosis helps the physician take appropriate measures.



Hantavirus Cleanup

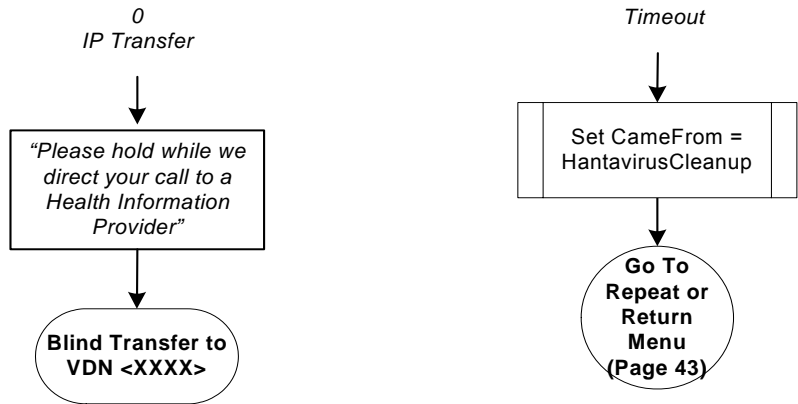
Message 5085

Listen to the Prevention message for information about eliminating rodents.

Get rid of rodents in and around the home.

Air out rodent infested buildings at least 30 minutes before cleaning. Do not sweep off dry vacuum rodent contaminated surfaces which may stir up the dust and allow potentially contaminated dust to be breathed in. Spray contaminated surfaces with bleach solution. The bleach solution should be made up of 1 cup bleach to 1 gallon of water. Allow it to sit for 5 to 10 minutes before cleaning it with a mop or wet vacuum. Wear gloves.

In heavily rodent infested areas or situations where ventilation and/or wet clean-up can not be effectively done, use a face mask with HEPA filter.



Hantavirus Prevention

Message 5086

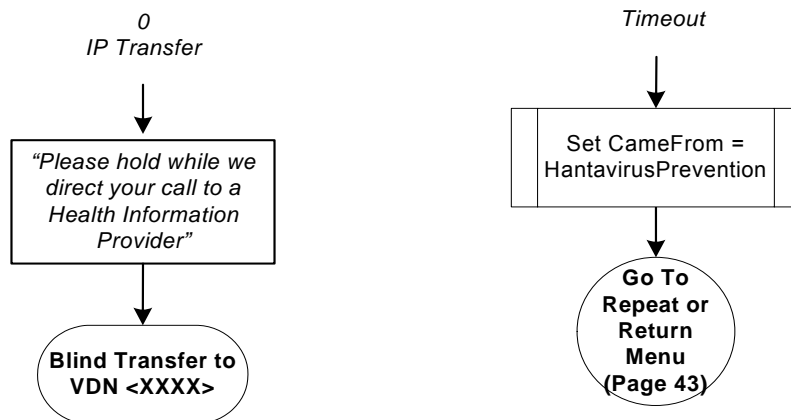
Seal holes and cracks $\frac{1}{4}$ inch or larger with steel wool, metal sheeting hardware cloth, or patching plaster. Insure weather seals under doors are tight and screens are in good repair.

Eliminate food and water sources. Store pet food and bird seed in metal containers. Feed animals only as much as they will consume at one time. Feed only in the daytime and remove food and water at night. Clean up spilled feed and seed. Keep garbage in containers with tight lids. Do not feed rodents. Limit possible nesting sites. Rodents like hiding places.

Indoors use snap traps with peanut butter and oatmeal. Spray carcasses with bleach solution. Bleach solution is made of 1 cup bleach to 1 gallon of water. Let it soak 10 minutes. Use rubber gloves when handling the carcasses. Place carcass in bag and in outdoor trash. Outdoors you can use snap traps, multi-catch traps or poisons.

Keep grass and vegetation trimmed low. Store firewood up off the ground to prevent burrowing underneath.

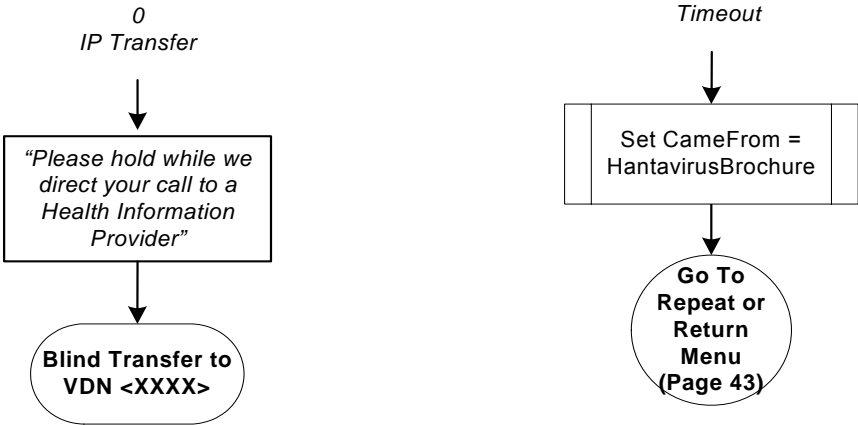
Store hay, woodpiles and equipment 100 feet away from the buildings if possible.



Hantavirus Brochure

Message 5087

A free brochure with information about Hantavirus and Rodent Prevention is available from the Colorado Department of Public Health and Environment. If you would like one sent to you please call toll free 1-800-XXX-XXXX.



Other Topics

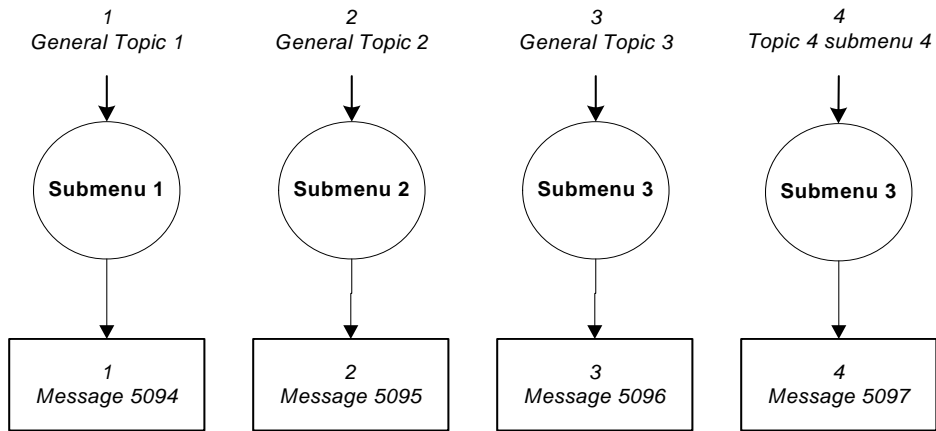
Note: This topic message is under development but up to 4 menu choices have been allocated to it (TBD = To Be Determined).

Message XXXX =

Message XXXX =

Message XXXX =

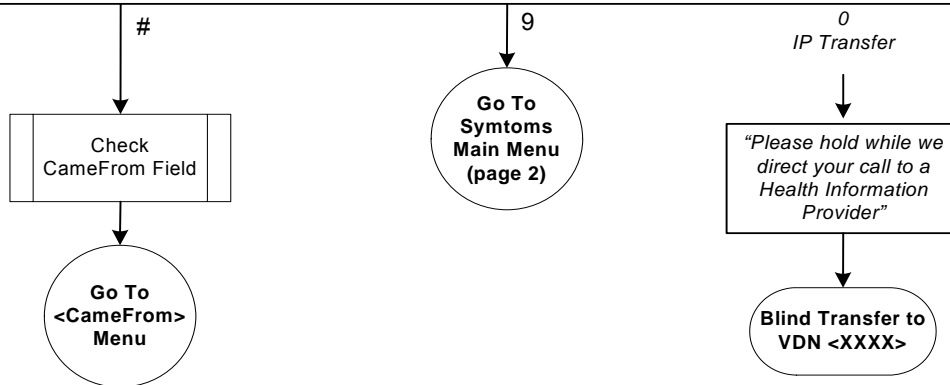
Message XXXX =



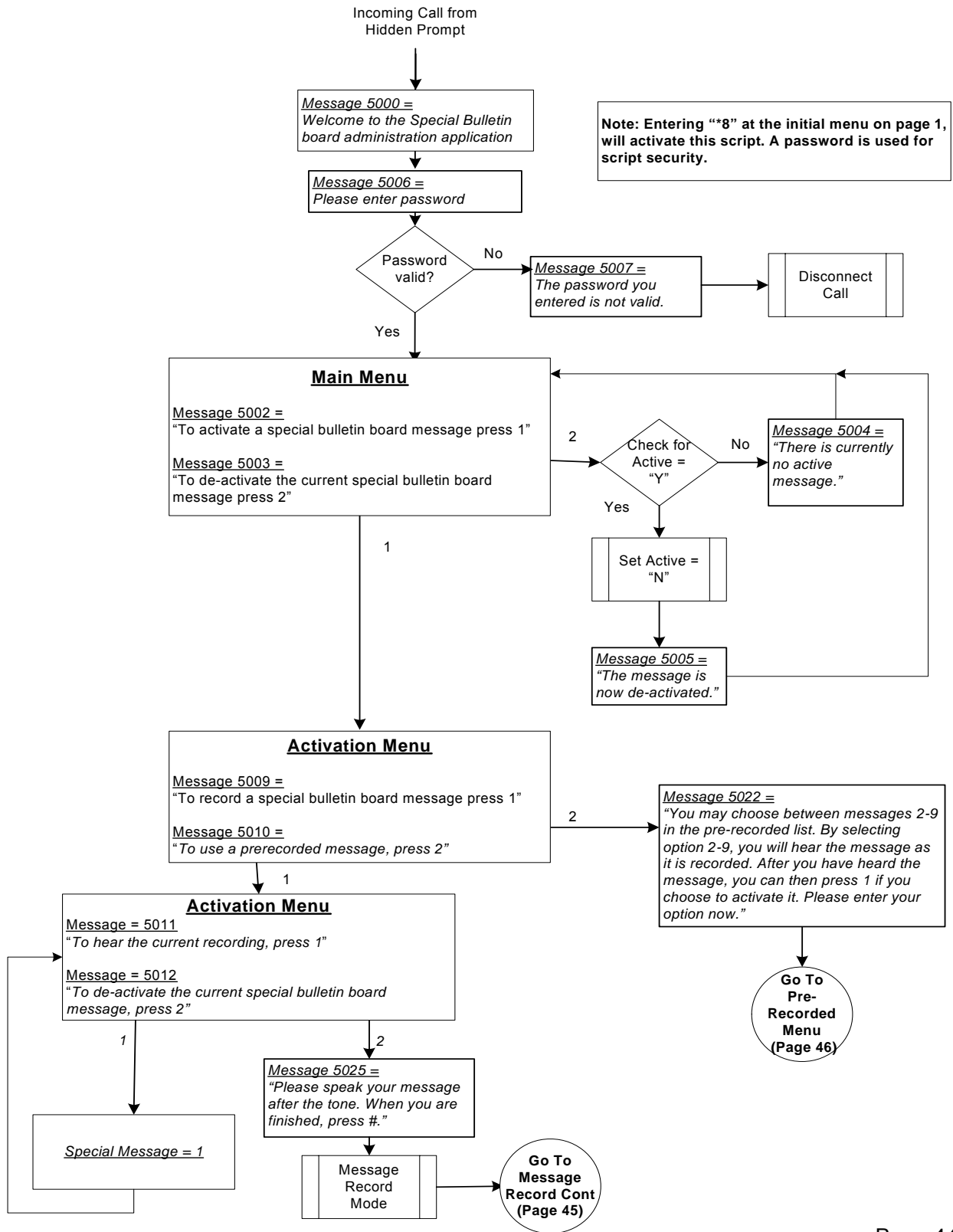
Note: If a caller does not make a selection from any menu, within a set period of time they will be prompted to select one of these three options

Repeat or Return Menu

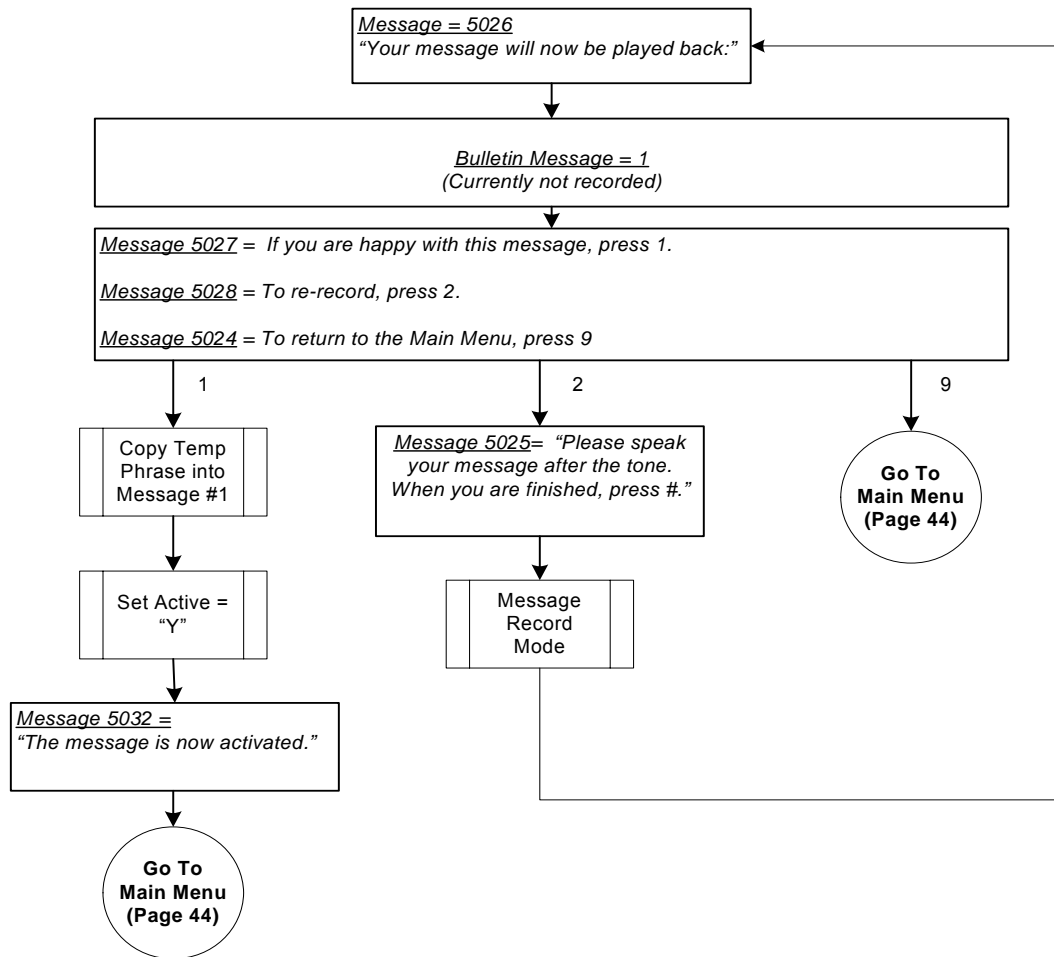
Message 5024 = To repeat this information, press #
Message 5025 = To return to the Main Menu, press 9.
Message 5026 = To speak with a Health Information Provider, press 0



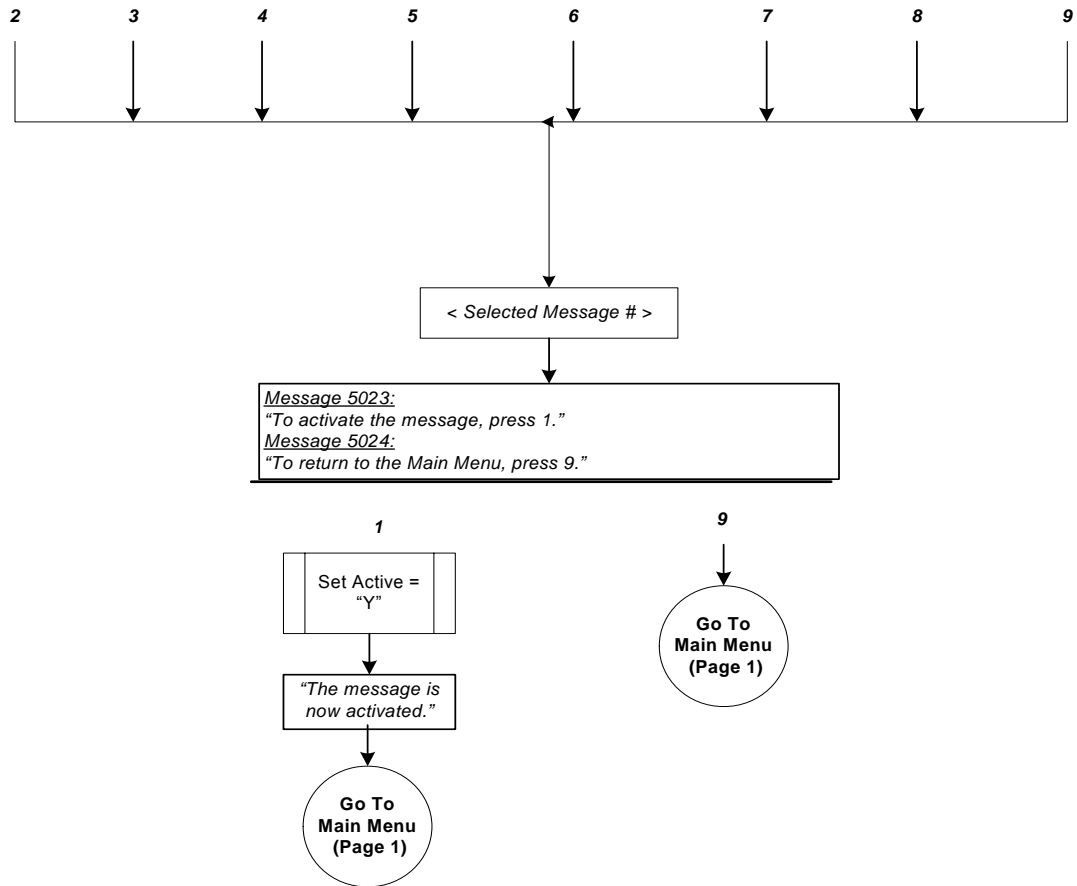
Administration of Bulletin Messages



Message Record Cont



Pre-Recorded Menu



5.0 Interactive Response Tool Implementation Document

The implementation phase includes building or purchasing the technology/system, testing and piloting it, training staff on it, migration of it into an active environment, and then going live. During this phase, the technology solution undergoes comprehensive testing first by the project team and internal users and then by external users. This allows for both coarse and fine tuning to validate that application designs meet the requirements and objectives. The implementation plan should incorporate appropriate users in the process, establish realistic time frames for tasks, provide adequate opportunity for feedback, and establish criteria for measuring success. Depending on the environment of your call center, you may consider using change management strategies to create a positive environment for learning and change among the staff impacted by the implementation. Our project team was responsible for ensuring that each component of the implementation phase was addressed following their clearly defined roles and responsibilities.

Building the Technology Solution

Since we previously purchased an IR system, our first task was to build a technology solution utilizing this equipment. This included development of the IR applications and making programming changes to the telephone switch to support IR application functionality. We contracted with an IR consultant and developer to oversee the development of the applications in accordance with our business requirements and specifications. The IR consultant developed the applications, provided administration and maintenance training for our Information Technology (IT) group and assisted with modifications to the applications after testing. Our IT group made the appropriate programming changes to our telephone switch to support the IR applications.

Implementing the Solution

The following is a project time line for the implementation milestones, the responsible person(s), and the timeframe for completion. The implementation phase occurs after completion of the planning, analysis, and design phases (approximately 6 to 8 weeks). The timeframes listed do not necessarily occur in series; many can be done concurrently while other milestones are in progress. There also may be delays between milestones due to other demands on the responsible person(s) and the resources they require to support them.

The following table outlines the major implementation milestones for the four applications (approximately 34 weeks to complete):

Milestone	Responsible Person(s)	Timeframe
Develop IR applications	IR Consultant	8 weeks
Test IR applications on IR consultant system (test environment)	IR Consultant	4 weeks
Internal testing of QI Monitoring application prototype	Telecommunications Engineer/Project Manager	2 weeks
1 st External testing of QI Monitoring application prototype	Telecommunications Engineer/Project Manager	4 weeks
Install applications on IR system	Telecommunications Engineer/IS Manager	2 weeks
Record messages and announcements for all IR applications	Telecommunications Engineer	2 weeks
Internal testing and validation of all four applications	Telecommunications Engineer/IS Manager	2 weeks
2 nd External testing of all applications	Project Manager	4 weeks
Train IT group to administer and maintain applications	Telecommunications Engineer	2 weeks
Adjust and refine applications and their recorded messages	Telecommunications Engineer	4 weeks
Document application designs and administration procedures	Telecommunications Engineer	4 weeks

5.1 Testing

We used an iterative testing approach that included four cycles of testing: 1) technology testing (external testing by the IR consultant and internal IT group testing), 2) internal testing by our call center staff, 3) external testing by a rural user group, and 4) external testing by an urban user group. This testing approach gave ample opportunities to validate that the applications function as required and that any difficulties in using the applications were identified and addressed (user acceptance testing). These testing cycles are already included in the overall implementation timeline in the previous section. Total time for testing required approximately 16 weeks to complete.

5.2 Training

The training strategy for this project was to ensure that the general public with a touch tone telephone should be able to navigate through these IR applications and have a positive overall experience.

In a testing environment, we could not convey instructions through the media or other channels that we would use in an actual emergency situation. Therefore, we had to incorporate clear directions for users within the applications themselves so that there would be a high probability of user acceptance. Some of the directions that were incorporated into the applications include:

- An option to connect to an information provider (live person) when there is an appropriate need or if the user gets lost within the application
- An option to repeat a message so that the user can hear it again to fully capture the information being relayed
- An option to utilize the application again (such as with POD and DI applications) so they do not have to call again to enter a different response
- An option to return to the main menu (such as with FAQ Library application) so they can get answers to more than one question they may have

There is always a trade off with devoting time at each step in an IR application with providing instructions in addition to the critical messages, so a balance in providing good guidance while keeping callers moving through the application has to be achieved. Testing of applications with user groups is one of the best ways to determine that balance.

It would be best to incorporate clear instructions into the QI application; however, we would still recommend public health agencies develop an instruction sheet for quarantine that includes what is expected of those in quarantine, what they should expect during the quarantine period, and what resources to contact for anticipated difficulties in maintaining quarantine (food, medications, finances, etc.).

5.3 Migration

The migration plan has both a technical and a business component. The technical component (conversion plan) describes how the new system will be installed and where applicable, how data in the previous system will move to the new system (this does not apply for this technology solution). Installation of the IR technology solution and the steps involved were discussed in previous sections. The business component includes a change management plan that helps users understand the change and motivate them to adapt to the changes.

The change management plan for this effort began early in the process and continued throughout the project. The project team, steering group and external advisory panel represented the key stakeholders and users that the technology system would impact. We focused on communication and feedback throughout the process to ensure members understood the costs and benefits for the organizations involved and end user groups, our plan for implementing the technology solution, how we would measure success, and the feedback process for continuous improvement. The iterative testing strategy provided a feedback loop for participants and users to identify what worked and what did not work so that appropriate changes could be made to the applications. These ultimately should result in applications that are well designed, efficiently deliver the required capabilities and do so in a manner that is effective and acceptable to the user.

5.4 Success Measures

It is critical to develop criteria for measuring success of any technology under development. Measures may include ease of use, successful installation, accurate programming performance, system security, accurate reporting, database accessibility, hardware and software reliability and maintainability. Success measures should reflect the essential criteria that the organization expects the solution to have. Success measures for the entire project included those for the management and development of call center applications to support outpatient health care and monitoring in a major public health event. For the tool itself and the applications developed, the measures of success were the following:

- Project completed within allotted timeframe and budget.
- Project goal met – developed IR applications that community health call centers could implement.
- IR applications developed within available IR technology/system.
- IR applications addressed the anticipated response needs for the users.
- IR applications were designed for a high probability of user acceptance (good user ratings for the following eight criteria):
 - Directions given by the IR were easy to follow.
 - Recorded voice on the IR was easy to understand.
 - Recorded voice on the IR went at a proper speed.
 - Recorded voice on the IR was at a proper volume.
 - User satisfied with experience using the IR.

- User had a positive opinion of the IR.
- User would trust receiving supportive contact or information via an automated system like the IR during a public health event, User would accept receiving supportive contact or information via an automated system like the IR during a public health event.

Each of the above criteria and the measurements and feedback received from testing will be reviewed in the Evaluation Document below.

6.0 Interactive Response Tool Evaluation Document

6.1 San Luis Valley Region Exercise

The San Luis Valley Region is made up of six rural counties located in the Southwest of Colorado. Most of public health agencies in the valley only have one or two public health nurses assigned to them. The total census population for the region is 48,000 but population can increase to greater than 75,000 in the summer months. We decided to test a prototype version of the QI Monitoring application in conjunction with a planned influenza vaccination exercise in this rural area.

Exercise Design

In order to test the vaccination plans that would be used during a disease outbreak, such as for pandemic influenza, public health nursing services in the six counties in the San Luis Valley conducted free flu shot clinics beginning on Saturday, October 15, 2006. The exercise began with a fictitious health emergency being declared. Area clinics were opened and flu shots were provided to the public to test the ability of the local public health agencies to respond to this staged incident. As part of the response, each county public health nursing service also practiced the ability of its staff to isolate ill persons and to quarantine people who have been exposed to ill individuals.

A series of questions was asked before each person was admitted to the vaccination clinic to segregate out those who were already ill and may need to be quarantined. A “Yes” answer to any of the following questions was sufficient for the person to be assigned to home quarantine:

- Do you have a fever now?
- Do you have body aches now?
- Do you have a new cough or new sore throat?
- Have you been around someone who has the flu or the above symptoms?

Methodology

Two citizens in each county, a total of 12, volunteered to be mock “isolation cases” and help test the QI Monitoring application. Data on individuals to be placed into isolation were collected (see sample Case/Contact Investigation Report Form – Appendix 4-A) and faxed to the Regional Epidemiologist who entered them into the State Health Department’s Outbreak Management System. Data were transferred twice each day (prior to start of calling periods) as a flat file to test our ability to utilize this for directing the QI Monitoring application to call people. We were also provided the list of all mock cases and their contact information to verify that the application received the complete list and made the appropriate calls. The Quarantine/Isolation (QI) Monitoring application called the 12 volunteers identified for quarantine and isolation during the exercise to check on their status (whether they answered the provided phone number) two times (calling periods) per day for 2 to 4 days.

Results

The application was able to utilize the received flat files for contacting volunteers prior to each calling period. There was difficulty in reaching one person who had a telephone number that blocked solicitation calls (they also use IR systems). This was disabled to permit receipt of calls from the IR

system. Otherwise the application successfully dialed all listed phone numbers. All 12 volunteers successfully interacted with IR application (call registered as answered by a person) at least once during their quarantine. Four of the volunteers answered the IR application calls within 1 or 2 attempts for all calling periods. The Regional Epidemiologist was notified whenever a volunteer had not answered for two consecutive calling periods, signifying a need for a home visit. This occurred for 8 of the volunteers who failed to answer the IR application calls within 2 attempts for two to four consecutive calling periods.

- Total number of calling periods for all 12 volunteers = 74.
 - # Calling periods with calls answered with 1 attempt = 38 (51 percent).
 - # Calling periods with calls answered with 2 attempts = 14 (19 percent).
 - # Calling periods without calls answered with 2 attempts = 22 (30 percent).
- Notifications to Regional Epidemiologist (2 consecutive calling periods without an answer) = 14.

The feedback from volunteers and exercise organizers suggested several potential improvements for the QI Monitoring application (followed by our assessment of each suggestion):

- Have the option to repeat messages. (Such an option was added).
- Call up to three times during an hour to attempt contact. (Application could be programmed to call as many times per day as needed.)
- IR system should recognize telephone prefixes and call the appropriate county health agency when someone does not answer. (This is not possible with the IR system.)
- Recorded voice should speak slower. (Recordings updated with best “voice” for speed, clarity, tone and volume.)
- If cell phone is called, integrate GPS information to insure the person is still at home. (This is not possible with the IR system.)
- IR should give a phone number to call back on if the person cannot wait to speak to someone. (It is important that the quarantined person complete calls when received, but the application does provide an announcement of a direct number to use if assistance is needed afterwards.)
- Cancel call forwarding feature to limit calls to a land line telephone at the person’s home. (This would require cooperation of telephone service provider and be subject to applicable laws.)
- Provide an electronic link between State Health Department and the call center to transfer case or contact data. (A flat file was used to export list of contacts to make prior to each calling period – it is a manual process for loading this file into the application.)

There were also suggestions for public health agencies using this application:

- Have someone make at least one home visit during the home quarantine or isolation period.

- Develop protocols for children.
- Develop protocols for more than one case or contact at the same location.
- Provide an information sheet to home quarantine or isolation candidates explaining:
 - What to expect.
 - What to do in certain instances.
 - What not to do.
 - Who to call if you need help.

Summary

There were several key lessons learned from the San Luis Valley Region Exercise. In a pandemic influenza or other infectious disease (i.e. SARS) scenario, home quarantine or isolation may be an important, early component of the public health response. With effective risk communication messages to the public and adequate support for those in quarantine, we expect a good percentage of compliance. Small public health agencies (and perhaps larger agencies) will have difficulty keeping track individuals in home quarantine or isolation. This will require extensive personnel resources without the benefit of a system like the IR and the QI Monitoring application (or some similar monitoring strategy). In this test the application was able to monitor up to 70 percent of the quarantined persons which demonstrated compliance with little personnel resources. This may help public health agencies free up resources to focus on non-compliant individuals or manage the myriad of other response actions required.

6.2 North Central Region Exercise

The North Central Region (NCR) consists of 10 counties in the Denver metropolitan area with a population of 2.7 million people. The geography of the NCR ranges from mountainous rural to suburban foothills to urban plains areas. The NCR was established by Colorado as a Homeland Security region. The NCR is participating in the Cities Readiness Initiative (CRI) with the goal of “get pills into people within 48 hours using every method available to save as many lives as possible.” The antibiotic medications the CRI is preparing to distribute will come from local caches as well as the Strategic National Stockpile (SNS), if necessary.

Exercise Design

The goal of the NCR Exercise was to test the ability of the four IR applications to initiate contact and effectively communicate key information to users. In addition to a more fully developed version of the QI Monitoring application, public health volunteers also tested the Drug Identification (DI), Point of Dispensing (POD) and Frequently Asked Question (FAQ) Library applications. Up to ten volunteers from each county participated in the exercise beginning on May 2, 2006. A total of 96 volunteers tested the QI Monitoring application, with approximately one third assigned to test one of the three other applications. The goals for testing each application were:

- QI Monitoring: initiate contact and assess health status of individuals in quarantine reflective of their assigned “health” scenario.

- DI: provide accurate pill identification based upon supplied drug photo.
- POD: provide accurate location for drug distribution based upon entered zip code.
- FAQ Library: to provide accurate information that was retrievable by the user about an assigned health concern.

Evaluation Methodology

Unlike the first exercise in the San Luis Valley, this exercise was strictly scripted so that we could evaluate IR application accuracy as well as how the user assessed the applications upon a set of eight criteria. Volunteers were provided a call log (see Appendix 4-B) to record their experiences with the QI Monitoring application. An additional evaluation form was used to record the answers from their use of one of the three assigned other applications (Appendices 4-C – 4- E). The volunteers evaluated the QI Monitoring and other assigned application on specific aspects using a 5-point scale (5 = Strongly Agree, 4 = Agree, 3 = Undecided, 2 = Disagree, 1 = Strongly Disagree). The eight criteria used to evaluate each IR application were:

- Directions given by the IR were easy to follow.
- Recorded voice on the IR was easy to understand.
- Recorded voice on the IR went at a proper speed.
- Recorded voice on the IR was at a proper volume.
- User satisfied with experience using the IR.
- User had a positive opinion of the IR. (This criteria was tailored to a specific question about each application.)
- User would trust receiving supportive contact or information via an automated system such as the IR during a public health event.
- User would prefer to receive supportive contact or information via an automated system such as the IR versus a person during a public health event

The QI Monitoring application attempted to contact all volunteers during two call periods (9:00am – 11:00am and 2:00pm – 4:00pm) each day for two consecutive days. Each volunteer was assigned one of four “health” scenarios so we could determine, once contacted, if the QI Monitoring application correctly reported a person’s health status.

The following is an example “health” scenario:

“You are a 65-year-old man who has been quarantined since May 1st and is expecting to receive automated calls verifying your health status on May 2nd and May 3rd. You begin experiencing

symptoms including body aches and fever above 100°F on the afternoon of May 3rd. You will be contacted by the IR for your health status and should respond according to the following:

- May 2nd - morning: Temperature <100°F (no assistance needed) May 2nd - afternoon: Temperature <100°F (no assistance needed) May 3rd - morning: Temperature <100°F (no assistance needed).
- May 3rd - afternoon: Temperature >100°F (assistance needed)

Volunteers returned call logs after the exercise and their evaluations of the applications and comments were reviewed to determine if any modification would be needed.

Results

We received 93 evaluations (97 percent return rate); 88 evaluations were completed representing 92 percent of volunteers. The results for each application will be discussed in the following sections.

Quarantine/Isolation (QI) Monitoring

The modified version of this application was again able to utilize a flat file for contacting volunteers. A problem was encountered during the first calling period with dialing three long distance numbers. The application was quickly modified to allow for long distance dialing (“1” added to front of long distance numbers) for the three remaining calling periods. Otherwise the application successfully dialed all listed phone numbers for all calling periods. All but two volunteers successfully interacted with IR application (call registered as answered by a person) at least once during their quarantine. Fifty-nine (61 percent) of the volunteers answered the IR application calls within 1 or 2 attempts for all calling periods: 20 answered for three periods, 14 for two periods, and 1 for just one period. Four times a person made a mistake in the language selection (and could not go on to select a health status – instructions what to do if this occurs could be provided upon enrollment). A county public health contact was notified whenever a volunteer had not answered for two consecutive calling periods, signifying a need for a home visit. This occurred for 15 of the volunteers who failed to answer the IR application calls within 2 attempts for two to four consecutive calling periods.

- Total number of calling periods for all 96 volunteers = 382.
 - # Calling periods with calls answered with 1 attempt = 278 (72 percent).
 - # Calling periods with calls answered with 2 attempts = 45 (12 percent).
 - # Calling periods without calls answered with 2 attempts = 59 (15 percent).
- Notifications to Regional Epidemiologist (2 consecutive calling periods without an answer) = 19.

The majority of volunteers indicated favorable scores (4 or 5) for seven of the eight criteria used to assess the QI Monitoring application (n=88):

- Directions given by the IR were easy to follow – 99 percent (mean score 4.6, median score 5.0).
- Recorded voice was easy to understand – 99 percent (mean score 4.7, median score 5.0).
- Recorded voice went at a proper speed – 98 percent (mean score 4.6, median score 5.0).
- Recorded voice was at a proper volume – 97 percent (mean score 4.7, median score 5.0).
- Satisfied with experience using the IR – 93 percent (mean score 4.6, median score 5.0).
- Had a positive opinion of the IR – 93 percent (mean score 4.6, median score 5.0).
- Would trust receiving supportive contact via an automated system like the IR during a public health quarantine – 88 percent (mean score 4.3, median score 5.0).

The only criteria not scored favorably by a majority of users concerned their preference in receiving health department contact from an automated system versus speaking to a live person: 43 percent with scores 4 or 5, mean score 3.4 and median score 3.0.

In hindsight we thought we should have asked users to assess if it would be acceptable to receive supportive contact from an automated system during public health quarantine. Indeed some of the comments received from users seemed to indicate that the IR would be acceptable for use during such an emergency. One comment raised the question whether this application could work for everyone. It was never our intention that this application could work for everyone. It would be at the discretion of public health agencies coordinating quarantine efforts to decide which individuals this application could assist in monitoring – the goal being that many individuals could be supported by this approach. That would reduce the overall number of individuals requiring personnel to monitor them, so those resources could concentrate on special needs cases.

- “Much faster automated...was on hold 11 to 12 minutes awaiting to speak to a live person – a reasonable time frame – but this will dramatically increase during a true emergency, using up cell phone batteries, increasing public anxiety, and overtaxing responders.”
- “Prefer a real person, but this was easy to understand.”
- “If an actual emergency occurred, I wouldn't mind being called by IR as long as I could get to a live person if my questions weren't answered.”
- “But will it work for everyone? Especially the very elderly living with relatives.”

Drug Identification (DI)

This application was tested to determine how effective it would be in assisting the public in identifying antibiotic drugs that may be distributed during certain public health events. The underlying challenge is that multiple medications will be distributed to the same household during an emergency and not all of them will look the same. For example there are multiple manufacturers of doxycycline, all of which are contained in the local and SNS stockpiles. Rather than calling their doctor or pharmacist to question them about these medications, this IR application offers a self-service alternative.

Thirty volunteers were assigned to evaluate this application. Rather than provide the actual medication, they were provided pictures of both sides of one of the doxycycline drugs, asked to identify it with the application and record the answer on an evaluation form (see Appendix 4-C). We received completed evaluations from 26 volunteers (83 percent return rate) assigned to test this application. A total of 24 (92 percent) correctly identified the pictured drug: 22 identified it as doxycycline, 2 identified it as an antibiotic, 1 did not provide an answer and 1 indicated that the color of the pictured drug did not match any of the options (a printer issue – see comment below).

- “The prompt asked for a brown pill not pink with this imprint.”

To increase the ability of callers to correctly identify drugs, the application includes drug type (capsule, tablet), drug shape, drug color and drug imprint for identification. In a real event, this caller could have been routed to an Information Provider for assistance (an option that could be added to the application) or directed to another resource.

The majority of volunteers indicated favorable scores (4 or 5) for seven of the eight criteria used to assess the DI application (n=26):

- Directions given by the IR were easy to follow – 96 percent (mean score 4.6, median score 5.0).
- Recorded voice was easy to understand – 88 percent (mean score 4.5, median score 5.0).
- Recorded voice went at a proper speed – 85 percent (mean score 4.3, median score 5.0).
- Recorded voice was at a proper volume – 92 percent (mean score 4.5, median score 5.0).
- Trust automated system to correctly identify drug – 77 percent (mean score 4.2, median score 4.5).
- Satisfied with experience using the IR – 73 percent (mean score 4.2, median score 5.0).
- Would trust receiving information via an automated system like the IR during a public health emergency – 77 percent (mean score 4.2, median score 4.5).

The only criteria not scored favorably by a majority of users concerned their preference in receiving health department information from an automated system versus speaking to a live person: 42 percent with scores 4 or 5, mean score 3.4 and median score 3.0. Again, we thought we should have asked users to assess if it would be acceptable to receive information about medications from an automated system during public health emergency. Indeed one of the comments received from users seemed to indicate that the IR would be acceptable for use during such an emergency.

- “Talking to a real person is always comforting but this system did work well.”

Other comments identified improvements for the application including recorded messages (spelling out drug names, using better voice for recording) and an option to identify more than one drug appearance per call. We made the appropriate modifications to the application to address these suggestions.

- “I could not understand the name of the medication. Need to pronounce it better and slower. Spelling it would help.”

- “It would be nice to be able to identify more than one pill per call if there is potential for family members to have different products. I wouldn’t want to listen to the introduction more than once”

Point of Dispensing (POD)

This application was tested to determine if zip code specific messages could assist users with getting POD locations where drugs are being distributed. The application allows users to call and receive very specific messaging according to their entered 5 digit zip code. This application provides self-service information delivery where messages could be modified for a variety of events besides mass drug dispensing. Major application benefits include:

- Provides consistent, accurate information dependent upon entered zip code.
- Collects zip code data to characterize events (situational awareness – where are callers from and should more media messaging be used).
- Expands capacity for handling surges since calls are handled without personnel.
- Adaptable to any emergency where zip code specific messaging is needed including shelter in place strategies.
- Supports mass prophylaxis/immunizations.

Thirty-six volunteers were assigned to evaluate this application. Callers were instructed to enter a 5 digit zip code, record that zip code and the location they were given on an evaluation form (see Appendix 4-D). We received all 36 evaluations back (100 percent return rate) and all recorded the correct POD location for their entered zip code.

The majority of volunteers indicated favorable scores (4 or 5) for seven of the eight criteria used to assess the POD application (n=36):

- Directions given by the IR were easy to follow – 83 percent (mean score 4.3, median score 5.0)
- Recorded voice was easy to understand – 92 percent (mean score 4.4, median score 5.0).
- Recorded voice went at a proper speed – 81 percent (mean score 4.1, median score 4.0).
- Recorded voice was at a proper volume – 92 percent (mean score 4.4, median score 5.0).
- Information received was accurate based upon entered zip code – 94 percent (mean score 4.6, median score 5.0).
- Satisfied with experience using the IR – 86 percent (mean score 4.4, median score 5.0).
- Would trust receiving information via an automated system like the IR during a public health emergency – 86 percent (mean score 4.4, median score 5.0).

The only criteria not scored favorably by a majority of users concerned their preference in receiving health department information from an automated system versus speaking to a live person: 47 percent with scores 4 or 5, mean score 3.5 and median score 3.0. Again, we thought we should have asked users to assess if it would be acceptable to receive information about POD locations from an automated system during public health emergency.

Comments identified improvements for the application including recorded messages (using better voice for recording, providing major intersections to locations, eliminating confusing words) and an option to repeat location messages. We made the appropriate modifications to the application to address these suggestions.

- “I had to play the message several times to hear the location - still not sure what the name of the stadium was.”
- “Need ‘directions to location’ option. I really liked the message about ‘plenty of antibiotics’ and impression that people would be taken care of properly.”
- “Speak at different speeds for different parts of the message. Eliminate words like prophylaxis which don’t help most callers.”

Frequently Asked Question (FAQ) Library

This application was tested to evaluate the ability of users to navigate a library of messages and to obtain the desired information. Our HELP program uses this library for handling calls after hours and with great success. One of the benefits of the FAQ Library application is allowing self-service information delivery that is consistent and accurate. The application collects structured data to characterize the information needs of the public (situational awareness – what are public information needs and should media messaging be used for them). The application has the ability to expand capacity for handling surges and is capable of adapting to different events.

Thirty volunteers were assigned to evaluate this application. Callers were instructed to call, obtain the answer to the question they were assigned and record the answer on an evaluation form (see Appendix 4-E). We received 28 completed evaluations (93 percent return rate): 27 (96 percent) provided correct answers to one of the following assigned questions:

- What is the incubation period for West Nile Virus in humans?
- What are the symptoms of mold exposure?
- How do I know if I have West Nile Virus?

The one incorrect entry gave mold-growing conditions instead of symptoms of mold exposure.

The majority of volunteers indicated favorable scores (4 or 5) for all eight criteria used to assess the FAQ Library application (n=28):

- Directions given by the IR were easy to follow – 96 percent (mean score 4.6, median score 5.0)
- Recorded voice was easy to understand – 96 percent (mean score 4.6, median score 5.0)
- Recorded voice went at a proper speed – 82 percent (mean score 4.1, median score 4.0).
- Recorded voice was at a proper volume – 100 percent (mean score 4.7, median score 5.0).
- Able to easily navigate through the options to find information – 100 percent (mean score 4.7, median score 5.0).
- Satisfied with experience using the IR – 100 percent (mean score 4.7, median score 5.0).
- Would trust receiving information via an automated system like the IR during a public health emergency – 93 percent (mean score 4.5, median score 5.0).

- Would prefer receiving information via an automated system versus a live person during a public health emergency – 57 percent (mean score 3.7, median score 4.0).

This application received the most favorable evaluations from users. However, the lowest rating again concerned the preference in receiving health department information from an automated system versus speaking to a live person. The responses suggest that most users would find it acceptable to retrieve information from an FAQ library during public health emergency. Comments identified improvements for the application including recorded messages (using better voice for recording, eliminating confusing words), an option to repeat messages and an option to return to the main to answer another question. We made the appropriate modifications to the application to address these suggestions.

- “I felt that the symptoms were listed very quickly. IR needs to slow down just a little bit, otherwise very good!”
- “He went too fast to write it all down However, if I was calling to see if I had the symptoms, I would know what I was listening for and would probably not write all of them down.”
- “When you get to the answer you are looking for your only option was to repeat the message or start all over again. Could you also provide an option to go to the West Nile Virus main menu?”
- “Need way to slow down or pause recording when listing things, otherwise too much info too fast.”

6.3 Evaluation Summary

Exercise objectives were met and we obtained excellent feedback to help us improve the tested applications. We also obtained important information on what the user acceptance was for these IR applications. Although there were mostly favorable evaluations for all four applications, it was apparent the FAQ Library application seemed more acceptable than the DI application (perhaps because the latter concerned medications to be taken). The comments and evaluations of these applications should help Public Information Officers in determining which ones may be acceptable for different events and in developing messaging strategies. These results also suggest areas for potential community outreach efforts for public health agencies to create a more informed public. One lesson learned is that the applications will only be as good as the information that is developed for them and how it is provided to the public.

6.4 Future Research

These IR applications have yet to be tested with vulnerable and at risk populations (Spanish-speakers, seniors, etc). Such testing may be necessary to determine if some groups would respond as positively to the IR applications as the test groups did. Additional research will be needed to determine other information and resource needs for the public and how to provide them health emergency events.

Appendix 4-A. Case/Contact Investigation Report Form

San Luis Valley Region Pandemic Influenza Exercise

Case/Contact Investigation Report Form

(Fill in the blanks and circle all that apply. Please complete form as completely as possible.)

Report Date: ____/____/____ (mm/dd/yyyy)

Report Time: ____:____am/pm

*Diagnosis: Influenza Case → (must have fever ($\geq 100^{\circ}\text{F}$), plus cough or sore throat)

(circle) Influenza Contact (must be household member of a case in the past 5 days)

*If an Influenza Case, Illness Onset Date: ____/____/____ (mm/dd/yyyy)

*#Last Name: _____ (use alias from inject form if this is an inject case)

*#First Name: _____ (use alias from inject form if this is an inject case)

*#Birth Date: ____/____/____ (mm/dd/yyyy)

*Sex: (circle) Female Male

Race: (circle) Unknown American Indian/Alaskan Native

White Pacific/Hawaiian

Asian Black Other

Ethnicity: (circle) Unknown Hispanic Not Hispanic

Residence Information: Street Address City County ZIP

*#Address 1: _____

Address 2: _____

Phone Numbers:

*#Home: ____-____-____ *Work: ____-____-____

*Mobile ____-____-____

*Household Members: Name (Last, First) Birth Date Phone

Member 1: _____, _____ ____/____/____ ____-____-____

Member 2: _____, _____ ____/____/____ ____-____-____

Member 3: _____, _____ ____/____/____ ____-____-____

Member 4: _____, _____ ____/____/____ ____-____-____

(Use additional forms as needed for other household members)

Case Notes or Comments:

Person filling out this form (please print): _____

Please Fax this form ASAP to Regional Epidemiologist at XXX-XXX-XXXX or call XXX-XXX-XXXX

Appendix 4-B. QI Monitoring Call Log

North Central Region Exercise

Quarantine/Isolation (QI) Monitoring Call Log

An Interactive Response (IR) system is an automated tool commonly used throughout the business community to disseminate information and provide guidance to the public without requiring enormous amounts of manpower. If you have ever called a utility company or bank and were asked by a recorded voice to “press 1, press 2, or press 3” based on your needs, you have used an IR.

Public Health Preparedness Officials realized that this technology could be incredibly useful to help address community needs in case of a quarantine and isolation scenario, or as a method to disseminate zip-code based information regarding Points of Distribution (POD) sites for mass prophylaxis. To develop this, the RMPDC purchased an IR system for use through its COHELP program as a tool to assist in the delivery of information during a public health emergency, while lowering the impact of increased call volume on our call center staff.

As a volunteer, you will receive calls on May 2nd and 3rd from the IR system during the following call periods: 9:00am – 11:00am and 2:00pm – 4:00pm. The IR will make two attempts per calling period to contact you. In the event that you miss the two IR call attempts, our system will flag you as non-compliant.

When you receive the call, please answer the phone as you normally would. Your voice signals the IR to begin its message. Please follow the prompts based on your assigned scenario. By volunteering, you are assisting us in gathering a baseline capability assessment of the IR. Please do not try to “trick” the IR. After completing each quarantine call from the IR, please fill out the call log below. At the end of the exercise, please complete the attached survey regarding your experience with the IR. Thank you for your assistance in testing this system.

Volunteer Name: _____

Volunteer Phone Number: _____

May 2nd, 9:00am – 11:00pm Call Period

1. What time did the IR contact you? ____:____ AM PM

2. Did you answer your phone on the first or second call attempt of the IR?

Please circle: 1st 2nd Unknown

3. Based on your assigned scenario, what was your response to the IR? Please circle the letter of the correct response:

- a. High temperature, spoke to COHELP
- b. Normal temperature, no assistance needed
- c. Normal temperature, needed assistance with food, finances, or medication
- d. Not able to take temperature, spoke to COHELP

May 2nd, 2:00pm – 4:00pm Call Period

1. What time did the IR contact you? ____:____ AM PM
2. Did you answer your phone on the first or second call attempt of the IR?

Please circle: 1st 2nd Unknown

3. Based on your assigned scenario, what was your response to the IR?

Please circle the letter of the correct response:

- a. High temperature, spoke to COHELP
- b. Normal temperature, no assistance needed
- c. Normal temperature, needed assistance with food, finances, or medication
- d. Not able to take temperature, spoke to COHELP

May 3rd, 9:00am – 11:00pm Call Period

1. What time did the IR contact you? ____:____ AM PM
2. Did you answer your phone on the first or second call attempt of the IR?

Please circle: 1st 2nd Unknown

3. Based on your assigned scenario, what was your response to the IR?

Please circle the letter of the correct response:

- a. High temperature, spoke to COHELP
- b. Normal temperature, no assistance needed
- c. Normal temperature, needed assistance with food, finances, or medication
- d. Not able to take temperature, spoke to COHELP

May 3rd, 2:00pm – 4:00pm Call Period

1. What time did the IR contact you? ____:____ AM PM
2. Did you answer your phone on the first or second call attempt of the IR?

Please circle: 1st 2nd Unknown

3. Based on your assigned scenario, what was your response to the IR? Please circle the letter of the correct response:

- a. High temperature, spoke to COHELP
- b. Normal temperature, no assistance needed
- c. Normal temperature, needed assistance with food, finances, or medication
- d. Not able to take temperature, spoke to COHELP

Dear Quarantine Exercise Volunteer:

Please answer the following questions regarding your experience receiving calls from the IR during the Quarantine/Isolation Monitoring Exercise.

Questionnaire responses will use a scale of 1 to 5:

1 = Strongly Disagree

2 = Disagree

3 = Undecided

4 = Agree

5 = Strongly Agree

Please tell us how much you agree or disagree with the following statements:

1. The directions given by the IR were easy to follow.	1 2 3 4 5
2. The recorded voice on the IR message was easy to understand.	1 2 3 4 5
3. The recorded voice on the IR went at a proper speed.	1 2 3 4 5
4. The recorded voice on the IR was at a proper volume.	1 2 3 4 5
5. I am satisfied with my experience using the IR.	1 2 3 4 5
6. My opinion of the IR was positive during the exercise.	1 2 3 4 5
7. During actual public health quarantine, I would trust receiving health department supportive contact via an automated system like the IR.	1 2 3 4 5
8. Based on my experience with the IR, I would prefer to receive health department contact from an automated system vs. speaking to a live person.	1 2 3 4 5

Comments (Please use the back of this sheet for additional room if necessary)

Thank you again for your assistance in evaluating this communication tool. Your support will allow us to assist its public health partners in the event of community quarantine and provide important information to a large portion of the region's population in a public health emergency.

If you have questions about this tool or the testing process, please contact <Insert Test Coordinator Name> at the <Insert Their Agency Name>: <Insert Their Phone#> or <Insert Their Email Address>

Appendix 4-C. DI Evaluation Form

North Central Region Exercise Drug Identification Line Instructions

In addition to the quarantine calls you will be receiving over the next 2 days, the Interactive Response (IR) system has other possible uses in a public health emergency. As a volunteer, we request your assistance in testing one of these additional capabilities.

You have been requested to test the Drug Identification (DI) Line. In the event of a biologically based public health emergency, it may be necessary to distribute antibiotics to the entire Denver Metro region within 48 to 72 hours. Not all Point of Dispensing (POD) locations will be dispensing drugs that have the same appearance. It is also possible for an individual to forget which pills they received or become confused which pills are theirs. An automated inbound call system allows a caller to access this information using pill imprints, color, shape and size.

Using the automated system, please identify the pill pictured below by following the instructions and prompts provided by the IR. Please fill out the evaluation after you complete the call. Thank you for your assistance in testing this communication tool.

Volunteer Name: _____



1. Please call XXX-XXX-XXXX.
2. Using the photo above, follow the prompts to identify this pill.
3. Based on the information provided by the IR, what is this pill?

Please fill out the evaluation questions on the second page, and thank you for your assistance in testing the Drug Identification Line.

Dear Quarantine Exercise Volunteer:

Please answer the following questions regarding your experience using the Drug Identification Line.
Questionnaire responses will use a scale of 1 to 5:

1 = Strongly Disagree

2 = Disagree

3 = Undecided

4 = Agree

5 = Strongly Agree



Please tell us how much you agree or disagree with the following statements:

1. The directions given by the IR were easy to follow	1 2 3 4 5
2. The voice on the IR message was easy to understand	1 2 3 4 5
3. The recorded voice on the IR went at a proper speed	1 2 3 4 5
4. The recorded voice on the IR was at a proper volume	1 2 3 4 5
5. I trust that the automated system correctly identified my pill	1 2 3 4 5
6. I am satisfied with my experience using the IR	1 2 3 4 5
7. If a public health emergency actually occurred and I needed antibiotics, I would trust receiving health department information via an automated system like the IR	1 2 3 4 5
8. Based on my experience with the IR, I would prefer to receive information from an automated system vs speaking to a live person.	1 2 3 4 5

Comments (Please use the back of this sheet for additional room if necessary)

Thank you again for your assistance in evaluating this communication tool. Your assistance will allow us to provide important information to a large portion of the region's population in a public health emergency. We believe these tools have the greatest potential to reduce patient surge demands on the traditional health care delivery system facilities and allow public health agencies to focus on epidemiology and control measures.

If you have questions about this tool or the testing process, please contact <Insert Test Coordinator Name> at the <Insert tHeir Agency Name>: <Insert Their Phone#> or <Insert Their Email Address>

Appendix 4-D. POD Evaluation Form

North Central Region Exercise POD Information Line Test Instructions

In addition to the quarantine calls you will be receiving over the next 2 days, the Interactive Response (IR) system has other possible uses in a public health emergency. As a volunteer, we request your assistance in testing one of these additional capabilities.

You have been requested to test the Point of Dispensing (POD) Information Line. In the event of a biologically based public health emergency, it may be necessary to distribute antibiotics to the entire Denver Metro region within 48 to 72 hours. This POD Information Line will assist callers in finding the closest POD location based on the entered zip code and county. Please follow the instructions below and fill out the evaluation after you complete the call. Thank you for your assistance in testing this communication tool.

Volunteer Name: _____

1. Please call XXX-XXX-XXXX
2. Please follow the prompts, using the phone keypad to enter the zip code recorded on your volunteer registration form.
3. Please provide this entered zip code: _____
4. Please provide your county of residence: _____
5. Continue to follow the prompts to receive the location of your county's POD.
6. Which POD location did the IR message indicate for your county?

Please fill out the evaluation questions on the second page, and thank you for your assistance in testing the POD Information Line.

Dear Quarantine Exercise Volunteer:

Please answer the following questions regarding your experience using the POD Information Line.
Questionnaire responses will use a scale of 1 to 5:

- 1 = Strongly Disagree**
2 = Disagree
3 = Undecided
4 = Agree
5 = Strongly Agree

Please tell us how much you agree or disagree with the following statements:

1. The directions given by the IR were easy to follow	1 2 3 4 5
2. The voice on the IR message was easy to understand	1 2 3 4 5
3. The recorded voice on the IR went at a proper speed	1 2 3 4 5
4. The recorded voice on the IR was at a proper volume	1 2 3 4 5
5. The POD information I received from the IR was accurate based on my county of residence	1 2 3 4 5
6. I am satisfied with my experience using the IR	1 2 3 4 5
7. If I were actually needing antibiotics, I would trust receiving health department information via an automated system like the IR	1 2 3 4 5
8. Based on my experience with the IR, I would prefer to receive information from an automated system vs speaking to a live person.	1 2 3 4 5

Comments (Please use the back of this sheet for additional room if necessary)

Thank you again for your assistance in evaluating this communication tool. Your assistance will allow us to provide important information to a large portion of the region's population in a public health emergency. We believe these tools have the greatest potential to reduce patient surge demands on the traditional health care delivery system facilities and allow public health agencies to focus on epidemiology and control measures.

If you have questions about this tool or the testing process, please contact <Insert Test Coordinator Name> at the <Insert Their Agency Name>: <Insert Their Phone#> or <Insert Their Email Address>

Appendix 4-E. FAQ Library Evaluation Form

North Central Region Exercise

FAQ Library LineTest Instructions

In addition to the quarantine calls you will be receiving over the next 2 days, the Interactive Response (IR) system has other possible uses in a public health emergency. As a volunteer, we request your assistance in testing one of these additional capabilities.

You have been requested to test the Frequently Asked Question (FAQ) Library Line. For commonly asked questions specific to a public health emergency, an automated inbound call system was developed for callers to access recorded messages directly. The information is approved by the CDPHE, and therefore will maintain standardization with information being broadcast through other venues. This tool was originally developed and tested during Colorado's West Nile Virus outbreaks in 2003 and 2004 but can be supplemented with information about many other events.

Please follow the instructions below and fill out the evaluation after you complete the call. Thank you for your assistance in testing this communication tool.

Volunteer Name: _____

1. Please call (XXX)-XXX-XXXX
2. Using the prompts, please find an answer to the following question:

What is the incubation period for West Nile Virus in humans?

3. Based on the information provided by the IR, please record the answer to the provided question:

Please fill out the evaluation questions on the second page, and thank you for your assistance in testing the Frequently Asked Question (FAQ) Library Line.

Dear Quarantine Exercise Volunteer:

Please answer the following questions regarding your experience using the FAQ Library Line.

Questionnaire responses will use a scale of 1 to 5:

1 = Strongly Disagree

2 = Disagree

3 = Undecided

4 = Agree

5 = Strongly Agree

Please tell us how much you agree or disagree with the following statements:

1. The directions given by the IR were easy to follow	1 2 3 4 5
2. The voice on the IR message was easy to understand	1 2 3 4 5
3. The recorded voice on the IR went at a proper speed	1 2 3 4 5
4. The recorded voice on the IR was at a proper volume	1 2 3 4 5
5. I was able to easily navigate through the options to find the information I needed.	1 2 3 4 5
6. I am satisfied with my experience using the IR	1 2 3 4 5
7. In an actual public health emergency, I would trust receiving health department information via an automated system like the IR	1 2 3 4 5
8. Based on my experience with the IR, I would prefer to receive information from an automated system vs speaking to a live person.	1 2 3 4 5

Comments (Please use the back of this sheet for additional room if necessary)

Thank you again for your assistance in evaluating this communication tool. Your assistance will allow us to provide important information to a large portion of the region's population in a public health emergency. We believe these tools have the greatest potential to reduce patient surge demands on the traditional health care delivery system facilities and allow public health agencies to focus on epidemiology and control measures.

If you have questions about this tool or the testing process, please contact <Insert Test Coordinator Name> at the <Insert Their Agency Name>: <Insert Their Phone#> or <Insert Their Email Address>.