

Draft Final Report – Abbreviated Version

A Model for Adapting Community Health Call Centers to Support Outpatient Health Care and Monitoring in a Major Healthcare Crisis

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1.0 Executive Summary

Objective and Directives

The task order objective 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. To this end, we developed strategies, protocols and algorithms as tools for responding to specific scenarios by providing health information, triage/decision support, quarantine/isolation support, and drug information/identification. The tools were developed for specific scenarios but can be adapted to other scenarios when appropriate and cover the full range of capabilities that many community health call centers can provide.

There were five specific directives for this task order. The results for each one have summarized here and are more completely addressed within this report.

Results and Recommendations

1) Establish an advisory panel of Subject Matter Experts to supplement our expertise and provide assistance and guidance on the tasks and deliverables.

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: 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; and law and public policy.

In addition, we invited representatives from several key federal agencies to participate including the Department of Health & Human Services (Office of the Secretary, Agency for Healthcare Research & Quality, Centers for Disease Control & Prevention, Substance Abuse & Mental Health Services Administration, Food & Drug Administration, National Institutes of Health), Department of Homeland Security, Department of Transportation and the American Red Cross. Panelists and agency representatives convened at three advisory panel meetings and the final presentation meeting held in Washington DC over the task order period. At these meetings, agency representatives educated the panel and core team members on the current federal response efforts underway and how this project would best integrate 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 tools for assisting them in such responses. The expert panelists provided guidance on the development of the strategies and tools and helped refine them for greatest utility and exportability.

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

We chose to utilize 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, this group has been developed in a very structured manner and with participation of numerous federal agencies.

We reviewed all 15 scenarios and determined which ones 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 potential health call center capabilities that would be needed in a response to each scenario. These potential response capabilities included providing health information, disease/injury surveillance, triage/decision support, quarantine/isolation support, outpatient drug information/adverse event reporting and mental health assistance/referral.

We focus our model development on scenarios that involved major health impacts, had the potential for many "worried well" (those with little or no injury that could overwhelm healthcare delivery systems), could benefit from home management or sheltering in place strategies, and in which the community infrastructure was expected to remain intact so that call centers would be operable. It was determined that four biological related scenarios (Biological Attack – Aerosol Anthrax, Biological Disease Outbreak – Pandemic Influenza, Biological Attack – Plague, Biological Attack – Food Contamination) afforded the best opportunity to involve all six 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 within this report.

3) Research existing models, protocols and algorithms and 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. There were many local and state public health department websites providing flu vaccination clinic information that was searchable by using either city name or zip code. A few also had telephone information hotlines that

used either non-interactive recorded messages or someone answering them 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.

There were published reports describing the utilization 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 inquires to physician offices and local health departments. The authors suggested that state health departments consider a hotline for educating the public regarding influenza vaccination and to follow up with callers who were recommended to receive vaccination in order to improve compliance.
- A health department in Canada provided SARS information to the public through a hotline and supported the management of over 10,000 individuals placed in quarantine mainly in their own homes. The hotline required over 200 health department staff to support its operations over a three-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 of over 130,000 people, mostly in their homes for 10 to 14 days, to prevent 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) concerning 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 family.

These reports suggest that utilizing the telephone as a mechanism to provide information and to 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. 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 proactively 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. Since it launch in 2003, the HELP program has continually improved its capabilities to respond to major health events including West Nile Virus and influenza outbreaks. The HELP program today provides a model for disseminating and collecting

information in health emergencies in partnership with state and local health departments.

The HELP model also provides the needed functional platform for piloting and testing other call center strategies, technology and applications for efficiently providing information to the public in a health emergency. In this report we provide the HELP model blueprint so other health call centers can consider developing these response capabilities. We also report on a range of health call center-based information strategies and 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 strategies and tool development related to five health call center response capability areas: Health Information, Disease/Injury Surveillance, Triage/Decision Support, Quarantine/Isolation Support, and Outpatient Drug Information/Adverse Event Reporting. We addressed the Mental Health Assistance/Referral capability not as a specific health call center tool, but included how to reduce community anxiety and panic within the tools and strategies we developed for the other five response capabilities. Each response capability for community health call centers was assessed by the following criteria: significance of the response capability; applicability of capability to scenarios; current examples of the capability; range of technology to support the capability; staffing required to deliver the capability; and we then proposed tools 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 healthcare 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. There is applicability for providing health information in all scenarios with best association of health call center expertise and community need for the four scenarios of interest: 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 what the HELP program provides. We describe the components we found to be essential for developing a standardized and prepared response capability and which provide us the needed platform onto which additional capabilities could be added to support outpatient healthcare 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 tools for providing information to callers in a more automated manner, especially important in events that could generate increased call volumes that

surpass a call center's staff ability to answer calls. These two tools were developed for use with an IR system to allow callers to use their touch-tone phone to retrieve information. One allows callers to get zip code-specific messages and was developed specifically for finding point of distribution (POD) locations to get medications during an event requiring community prophylaxis, something the Cities Readiness Initiative program of the Centers for Disease Control and Prevention (CDC) is preparing for. The other allows callers to navigate through a library of Frequently Asked Questions (FAQs) to retrieve information relative to their concern. Both insure consistent and accurate information delivery: same information provided, every caller, every time.

Though the applications were developed for use with an IR system, they could be utilized 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 to be delivered based upon a zip code designation 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 for quantization of illness/injury (situational awareness) or for detection of 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 best association between health call center expertise and community need for disease/injury surveillance was Pandemic Influenza Outbreak, though almost all other scenarios could benefit from using call centers to capture health data for disease or injury surveillance.

A current example of health call centers contributing to disease surveillance includes the American Association of Poison Control Centers transmission of data related to toxic substance exposures to the CDC's BioSense program to improve the nation's capabilities for disease detection, monitoring, and real-time situational awareness through access to existing data resources.

The instructional guide for developing health information capability discusses structured data collection and public health partnering for developing disease/injury surveillance capabilities. The POD and FAQ applications besides providing health information also have the ability to collect data that could be useful in surveillance, such as which zip codes are entered for callers seeking information.

Triage/Decision Support

Health call centers can assist with triage and decision support for health concerns, can alleviate surges to health care facilities and thereby eliminate associated healthcare

costs from unnecessary hospital visits. The best association between health call center expertise and community need for this capability was for Pandemic Influenza Outbreak. 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 those without significant health effects or exposures from overwhelming healthcare 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 professional on a daily basis and this strengthens their credibility with the public. Research has shown that they reduce healthcare 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 utilize clinicians for its delivery of disease and symptom information, but provides this for the caller to use in making decisions for their own healthcare. Such an approach reduces the need to have clinicians on staff, a finite resource that will be in high demand during any health emergency. For normal daily operations trained information providers deliver scripted information and refer callers requiring exposure, symptom or injury triage and management support to appropriate resources such as a poison center, nurse advice line or a health care provider. Using information providers to handle most public information needs prevents unnecessary calls to clinician staffed lines so they can continue to handle medical triage and management support calls.

We propose that communities consider the clinical recommendations they would utilize in the event of a major health emergency such as pandemic influenza that severely impacts the healthcare delivery system. It may be necessary for a community to adjust standards of care in its plans for handling the increased patient demands that a pandemic or severe outbreak could result in. The healthcare delivery system and healthcare providers will need to consider how they would handle increased volumes of sick patients in the face of increased demands on limited healthcare resources. A health call center would need to ensure that its recommendations were consistent with the rest of the healthcare delivery system and its healthcare 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 tools. Research indicates public support of the use of quarantine to control disease and for monitoring the status of those in quarantine by telephone. This ability to support patients in quarantine and isolation was demonstrated in reported SARS control measures. 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 to

support such measures. Future SARS and other infectious disease outbreaks would require similar planning and response capabilities as for the influenza and plague scenarios.

Using telephones to monitor those in quarantine occurred in the SARS outbreaks in Toronto and Taiwan, and less than 1% of those in quarantine developed symptoms or were non-compliant. 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 tool for supporting quarantine and isolation monitoring strategies that uses an IR system and frees up staff to handle only those needing further attention such as those developing symptoms or those that did not answer. Since most in quarantine should only require periodic monitoring, automating much of that with the Quarantine/Isolation (QI) Monitoring tool could be of great utility.

The QI Monitoring tool automatically places calls to individuals in home quarantine to assess their current health status and reports on those that don't answer so further follow up can be made. The application is part of an IR system that can initiate up to 12,000 calls during a ten-hour period. Though this tool was developed for use with an IR system, it could be utilized 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 initiating contact with 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 where 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 upon 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, the supplied medications and collecting any potential adverse event reports. The two 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) or 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 a tool that would support mass prophylaxis with antibiotic drugs using an IR system. The Drug Identification (DI) application assists callers in identifying drugs dispensed and provides information on how to take them and what are potential adverse reactions. This would allow public health agencies to concentrate on operating mass dispensing sites and healthcare providers in caring for those that develop illness. Though this application was developed for use with an IR system, it could be utilized without such technology to guide call center staff in how to handle these calls. The tool could be adapted to other scenarios that might require mass administration of medications or vaccinations and to provide 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 are known and trusted resources within communities. All 15 scenarios will likely result in varying degrees of community fear, panic, anxiety and even 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 receive suicide and intentional harm calls regularly. 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 itself has been tested over three years of daily operations and in responding 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 and other 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 the handling of over 75,000 calls related to several major health events including West Nile Virus 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 effectively use initial announcements to relay the most requested information by callers to alleviate their need to speak with staff. On average 60% of callers listen to the recorded information and terminate the call indicating their concern was addressed with the announcement: this has remained fairly constant over the last three years and for a range of health events. Additionally, for those waiting in queue you can cycle recordings of other frequently requested information to hopefully answer their 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 are 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. Furthermore, by

reviewing the concerns of callers speaking with staff you 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.

The challenges we have encountered with surges in demand to HELP has lead us to produce tools 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 Distribution (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 then 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 a urban user group (n=96) consisting primarily of local health personnel from 10 counties in an exercise in May 2006. The goal of the second exercise was to test the ability of the four IR applications to either initiate contact and determine health status of those in quarantine (QI Monitoring) or to effectively communicate key information to users calling into the applications (DI, POD Locations, FAQ Library).

Overall 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 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 tools will only be as good as the information that is developed for them and how it is provided to the public.

5) Prepare a final report and recommendations.

This final report describes the model and its critical planning elements, the scenarios where the model could be effectively utilized at various levels of response, and a

comparison of the model to other existing models. A brief summary of recommendations follows:

In reviewing disaster scenarios for expected community needs, it becomes clear that we must help the public make informed decisions and to care for themselves during severe health events. It is only with such strategies that we can hope to alleviate many potential demands on healthcare delivery systems and 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 info/adverse event reporting
- Mental health support/referral

We used the Department of Homeland Security National Planning Scenarios for determining which scenarios could most benefit from the six potential health call center response capabilities. We decided to focus model development on the biological scenarios since they involved large health impacts, had the potential for many “worried well” (those with little or no injury that could overwhelm health systems), could benefit from home management of illness and sheltering in place strategies, and community infrastructure was expected to remain intact so that call centers would likely be able to operate. It was determined in conjunction with the advisory panel that four of the biological scenarios afforded the best opportunity to involve most of the potential response capabilities for community health call centers (Appendix 1):

- 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 afforded the greatest potential for success.

The target audiences for the proposed scenario-specific models and tools 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

These health call centers are familiar with basic physiological responses to particular health threats due to the knowledge and skills gained in their area of healthcare. The professionals employed by such centers have experience 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 non-clinical staff. In this way these centers could help with surge capacity and informing the public about health issues so they can make informed decisions and to care for themselves.

It seems wise to build upon the expertise, credibility and infrastructure of community health call centers when planning for emergency responses. By expanding their capabilities to inform, educate and assist the public with their health concerns, this can free up the healthcare delivery system to most effectively utilize 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 (“worried well”) – 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 should help the public 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.

The HELP model instructional document (Appendix 2) describes many of the essential components we have found necessary for an operational platform to provide consistent, accurate and up-to-date information during bioterrorism and other public health emergencies. The structure and adaptability of the HELP model has allowed us to effectively handle over 75,000 calls and meet both the needs of the public and public health agencies. Community health call centers can use this document to begin to develop similar capabilities within their existing infrastructure.

We strongly urge any call center attempting to provide the described community services do so in cooperation with the appropriate public health authority, which 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 overall consistency with other response measures.

The challenges we have encountered with surges in demand related to health events has lead us to produce tools to support outpatient healthcare and monitoring during health emergencies with limited staffing resources. The goal is to provide information to the public in a self-service manner so that they can make the 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 Interactive Response (IR) Tool document describes the details of the planning, analysis, design, implementation and evaluation of the four IR applications we developed:

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

The IR Tool document provides the blueprint for other call centers to develop similar capabilities within their own infrastructure and utilizing their own equipment. We suggest you review the IR Tool document with your internal technology staff to determine how best to develop the desired capabilities with whatever resources are available to you.

The model and tools proposed in this report are not the sole component but a part of a comprehensive public information strategy that includes among others:

- Use of mass media to provide the public information on preventive measures, home care management, and the appropriate time to seek health care services.
- Use of 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.
- Use of community health call centers to assist with outpatient (home care) monitoring and support, thereby helping to extend the reach of public health and healthcare systems into households.
- Use of information collected by the call centers for situational awareness and disease outbreak management and control.

2.0 Background

Contributors

Denver Health and its agencies, the Rocky Mountain Poison & Drug Center and Denver Health NurseLine (collectively RMPDC), have extensive experience leading research projects that focus on model development and evaluation through collaborative working relationships with local, regional and national organizations. We have previously completed a related task order for the Health Emergency Assistance Line and Triage Hub (HEALTH) Model (Task Order No. 6). This provided a solid foundation for us to expand upon in this current task order.

Denver Health

As a member of the Integrated Delivery System Research Network (IDSRN), Denver Health has been awarded four task orders focusing on developing models, tools and strategies for surge capacity in the event of a bioterrorist attack. These include the Regional Model for Bioterrorist Events (RMBT - Task Order No. 5), the Health Emergency Assistance Line and Triage Hub Model (HEALTH Model - Task Order No. 6), the National Hospital Available Beds for Emergencies and Disasters System (HAVBed - Task Order No. 8), and the Health Professionals' Cross Training for Mass Casualty Respiratory Needs (Project XTREME - Task Order No. 10). Denver Health has demonstrated leadership and the ability to collaborate with representative national partners in each of these task orders.

Rocky Mountain Poison & Drug Center/Denver Health NurseLine (RMPDC)

The RMPDC is one of the oldest poison control centers in the nation and celebrated its 50th anniversary during 2006. Our overall mission is to decrease the morbidity, mortality, health care costs and overall occurrence of poisonings and to provide medical expertise in poison, drug and nurse triage information. RMPDC is comprised of these divisions:

- Rocky Mountain Poison Center is a certified regional poison center by the American Association of Poison Control Centers (AAPCC) and provides 24-hour information to the public, medical professionals and contract clients related to poisoning treatment and poison prevention in a responsive, caring, and cost effective manner. It is involved in piloting a toxicsurveillance program with the AAPCC and CDC.
- Rocky Mountain Drug Consultation Center was established in 1977 to provide health and safety information to the public, medical professionals and contract clients on the safe and effective use of medications, adverse reactions, drug interactions, and drug use in pregnancy and lactation. It provides 24-hour access to medical information and collects adverse drug events under contract with pharmaceutical companies.
- Denver Health NurseLine was established in 1997 to provide 24-hour information to the public and contract clients regarding medical triage of health concerns and recommending further medical evaluation as appropriate. A published study of users of this service showed it effective at changing patient behavior related to health concerns.

- Toxicology Research & Consulting conducts vanguard research in the treatment of poisonings, provides toxicological consultative services and manages public health, environmental health and disaster preparedness projects awarded to RMPDC including the Denver Metropolitan Medical Response System (DMMRS) and Rocky Mountain Regional Pediatric Environmental Health Specialty Unit (PEHSU).
- Medical Toxicology Service provides physician consultation to our call centers regarding toxicological issues and medical management. It's physician training program is accredited by the Accreditation Council of Graduate Medical Education and has been training leaders in the field of Medical Toxicology for over 30 years.

The RMPDC has extensive experience consulting on cases involving children and adults potentially exposed to drugs, household/industrial chemicals, environmental agents and those who require triage advice and recommendations. Many cases are managed at home as often no significant exposure has occurred or health concerns do not warrant further evaluation. Costs and patient volumes to local medical facilities are reduced in most cases where RMPDC provides a telephone-based service. For exposures or health concerns requiring medical attention, patients are referred to local medical facilities and consultations are provided to the treating physicians.

The DMMRS program coordinated by RMPDC since 1997 has developed plans, assessed and trained essential city/county, metro-regional, state and federal agencies for response to nuclear, biological and chemical agent incidents. In May 2000, Denver was part of the national bioterrorism exercise, Operation TOPOFF. During this simulated exercise, local, state and federal officials and three Denver hospitals had the opportunity to address issues related to antimicrobial prophylaxis and infection control that would be applicable to disease outbreak management or pandemic influenza. The DMMRS program helped fund an Interactive Response (IR) system located at RMPDC for providing information to the 2.7 million citizens of the 10-county North Central Region (that includes metro Denver) during a health emergency. Many of the tools discussed in this report have been tested in this region and will be utilized for managing applicable emergency responses.

Core Development Team

Our core development team has had previous experience in examining the roles of medical call centers (poison centers, nurse lines, public health departments) in health emergencies through our previous AHRQ Task Order No. 6 – HEALTH Model that was referenced above. The products of that task order were a final report and associated call center tool set, which is described in a later section of this report. Since that time we have been developing health emergency response strategies through the Health Emergency Line for the Public (HELP) program we have piloted in Colorado and by obtaining technology to more effectively meet surge demand needs.

Core development team members with a major time commitment on this project:

- Gregory M. Bogdan, PhD – Principal Investigator, Research Director and Medical Toxicology Coordinator. He has experience in examining medical call center roles in

community emergency responses as the principal investigator of the AHRQ HEALTH model development task order and the HELP pilot program in Colorado. Dr. Bogdan has presented frequently on these concepts to the public health community through a series of AHRQ workshops and at national and international meetings. As the DMMRS Coordinator, he has experience with developing community response plans and testing those plans through exercises.

- Anna Seroka, RN, MEd – Co-Investigator, Poison Center Program Manager. She has extensive experience in developing call center services for a variety of purposes within the healthcare field. Ms. Seroka is responsible for daily operations for the HELP pilot program in Colorado requiring her to work with state and local health agencies as well as vendors to develop information content, decision algorithms, staff training programs, software customization, reporting procedures, referral networks and cost reduction strategies. She currently administers a pilot statewide toxicosurveillance project looking at poison center data in real-time to identify health problems.
- Deborah Scherger, RN, MS – Co-Investigator, Business Technology Manager. She has over 20 years experience in call centers and currently is in charge of the department that manages the telecommunications and information systems for our three 24 hour call centers. Ms. Scherger has completed a graduate program in public health nursing informatics and works with technology vendors to determine solutions for specific business requirements of the call centers and their clients.

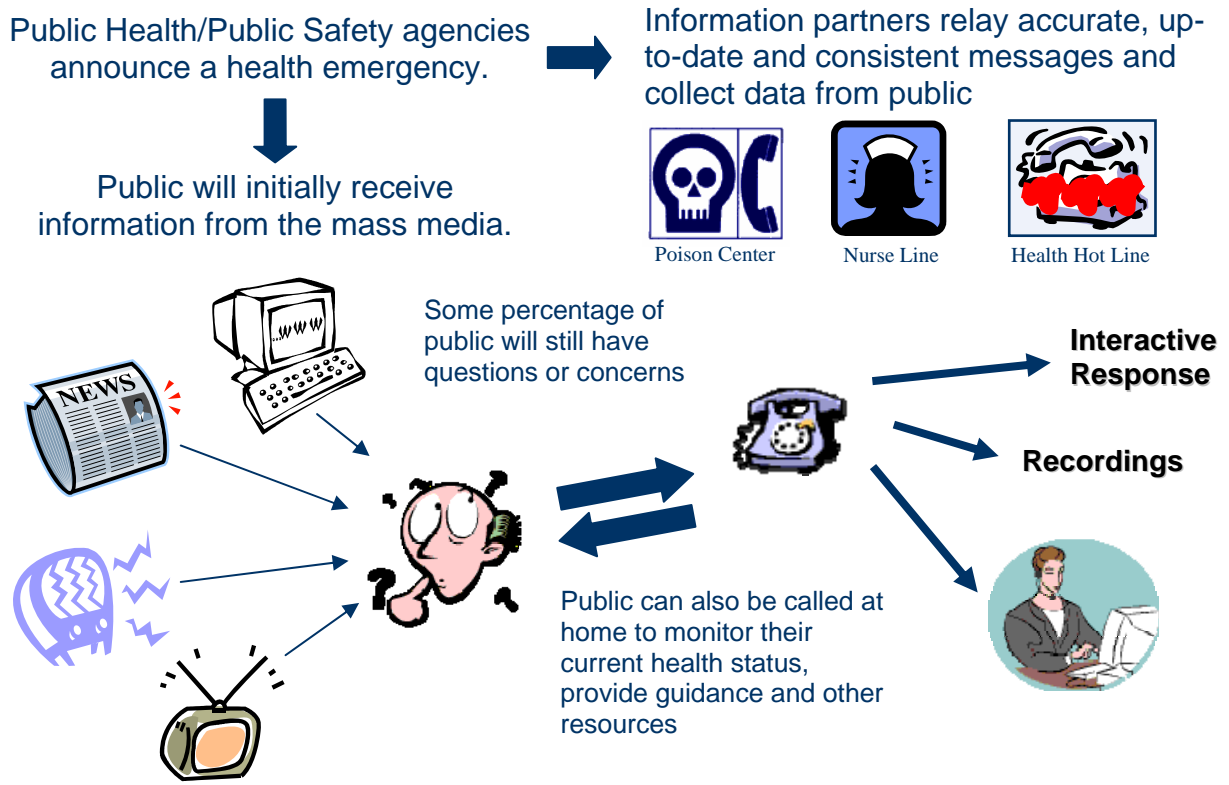
Other staff participating in this study include Steve Warren with over 20 years of experience in telecommunications and call center technology; Gwen Lewis with over 10 years of experience with call center operations, and Jodi Watson and Melinda Johnson, who coordinated grant activities, oversaw the core team development plans and organized advisory panel meetings.

Incorporation of 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, there will be no doubt that media outlets (newspapers, television, radio, Internet) will devote much time and effort into reporting upon 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.

Addressing the potential demand for additional and clarifying information is a competency that health call centers (poison control centers, nurse advice lines, health hot lines) have the expertise and experience in providing with a range of mechanisms from recordings to speaking to a trained professional. By partnering with public safety and public health agencies, the health call centers can provide information that is accurate, up-to-date and consistent with official messages. Besides clarifying information and relating it to questions from individuals, these call centers can also collect information for use in situational awareness of how the event is impacting the community (from the health concerns to the development of illness).

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

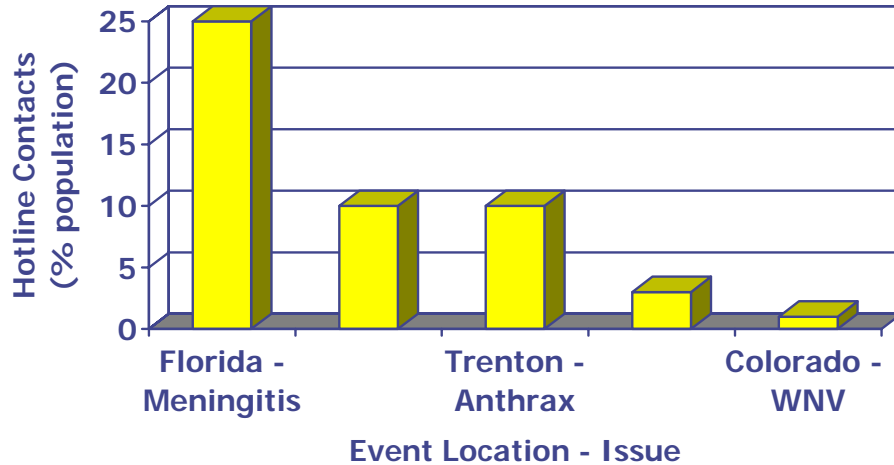


Addressing Public Concern

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% and up to 25% of the effected community's adult population depending upon 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 population) were much lower than concerns for an infectious disease outbreak primarily involving children in Florida.²⁻⁶

It has been demonstrated that the public perceives risk in a different manner than public health professionals.^{5,32} Experiences have shown that bioterrorism-related, child-focused and new emerging disease events have generated public concern resulting in people having information needs and contacting call centers. Though it may be hard to predict what this level of concern will be for any given health event, there has been research in the field of risk communication indicating that events involving certain risk perception factors play a role in determining levels of fear and concern. Covello et al (2001) 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.⁵

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



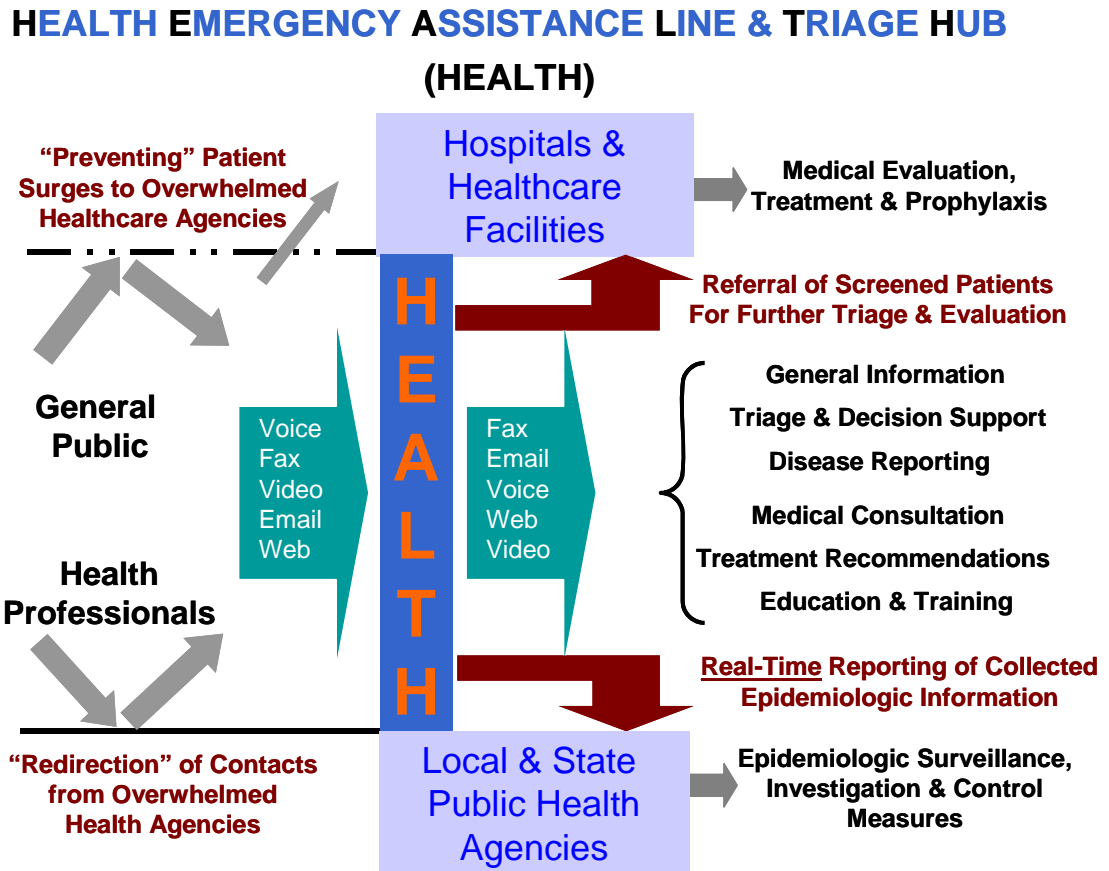
HEALTH

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 provided requirements, specifications, and resources needed for developing a public health emergency contact center that is highly integrated with public health agencies 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 (see Figure 3 below).⁶

As part of the analysis for the HEALTH model, research into other agencies' responses to past emergencies in both the published literature and through interviews of agencies involved in health emergency events was conducted. Also best practices from the medical call center industry were researched. From all of these sources, a list of requirements for the people, processes and technology required for realizing such a model were determined. Examples of technical documents detailing the requirements and systems concept for the HEALTH model as it applied to the technology infrastructure at RMPDC were developed and these could be generalized to other medical contact centers with similar functions and capabilities.

Figure 3: HEALTH Model Schematic



In order to further assist other agencies in beginning to develop 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 can be used by agencies 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 sections that are simple checklists or spreadsheets, including:

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

The need for realizing the HEALTH model concept has been continually reinforced by our own experiences, published reports on emergency event responses, and through conversations with other medical contact centers. In times of crisis, the public will need

information resources to help guide their actions related to their health care. 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 can be found at www.ahrq.gov/research/health.

HELP

The Health Emergency Line for the Public (HELP) pilot program in Colorado was established by our poison center to provide information during bioterrorism and other public health emergencies. HELP origins were as a pilot or proving ground for implementing some of the concepts and strategies that were developed in the HEALTH model task order. Since then it has been continually developed and has responded to three major health events in Colorado: the deadliest West Nile Virus (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 in health emergencies in partnership with a state health department that will be discussed and presented in this report.

The HELP service was offered to the public in January 2003 to support a statewide smallpox vaccination program in Colorado for healthcare volunteers. The vaccination program finished in March 2003 and the HELP service was temporarily suspended. 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 per day, featuring current recorded messages and website referrals for more detailed information. Trained information providers are available from 0700 to 2300 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 Frequently Asked Question (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 mold, influenza/pneumonia, anthrax/white powder, Severe Acute Respiratory Syndrome (SARS), Hantavirus, tuberculosis, avian influenza, and ricin. Other topics are added as information needs for the public and health providers are identified.

The HELP program provides the needed functional platform for which we can pilot and test 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 we have identified from the last three years of operating the HELP program service are addressed in later in this report and in Appendix 2.