The Pandemic Hotline

Social Innovation and Entrepreneurship: Saving Lives in the Next Pandemic

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Empowering the Public with Information

The Need for a Hotline in the Next Influenza Pandemic

During a national crisis such as an influenza pandemic, it is critical that accurate and consistent information be disseminated to all members of a community to keep them informed and empowered, and to help the community as a whole be more resilient. Although we anticipate the Internet serving as an effective source of information and support for many Americans during a pandemic, it is essential that a pandemic hotline serve as a redundant source of communication for several critical reasons:

- **Vulnerable populations may not have access to Internet-based resources.**
- **There will be people who feel less comfortable with or isolated by the Internet and would rather seek interactive, human support.**
- **We must be prepared for the possibility of the Internet being inaccessible.**

After exploring several potential models for building a hotline infrastructure that would be able to sufficiently support callers across the country, we propose that the most effective way of supporting the anticipated number of callers is with a toll-free hotline at a county, regional, or national level. At any geographic level, the pandemic hotline could use existing homesourcing technologies to provide callers with important localized information and then route them to citizen volunteers working from their homes. There are numerous significant benefits to building a hotline with this architecture:

- **A local, regional, or nationwide pandemic hotline has the capacity to handle a large volume of non-emergency calls, which will reduce the overwhelming strain on 911 and hospital hotlines.**
- **A local, regional, or nationwide hotline supported by volunteer medical staff will help to alleviate the overwhelming stress on hospitals and medical providers, and will save people from making unnecessary trips to seek medical care that could potentially expose them to the virus.**
- **A local, regional, or nationwide hotline allows for organizations such as the CDC, local health departments, and the Red Cross to swiftly disseminate consistent, real-time information to many volunteers at once.**
- **Answering calls from home is a safe way to volunteer and can tap the large number of people who are looking for an opportunity to help in the emergency situation, but will be at home due to social distancing measures.**

A Brief History of Hotlines Breaking Down in Disasters

While keeping individuals and communities connected during an influenza pandemic may pose unique challenges due to its nature and widespread scope, certain parallels can be drawn from case studies of large disasters such as Hurricane Katrina and the outbreak of SARS. From these emergencies, we can then look for opportunities for innovation to better provide support and promote resiliency during and after a pandemic.

In many analyses of the response to Hurricane Katrina, one of the areas most heavily emphasized is the widespread communication failure that the region experienced, both physically and structurally, and the serious repercussions this had for effective emergency response. Although a natural disaster such as Hurricane Katrina differs from a widespread pandemic in that it physically damages and destroys affected areas and infrastructure, a hotline at the county, regional, or national level is a valuable innovation for addressing callers' needs in any type of large-scale emergency. An infrastructure with volunteers working from home, equipped with consistent, real-time information, could have potentially been effective in relieving the functional call centers that were extremely overwhelmed by callers during Hurricane Katrina.

A second example of communication breakdown during a widespread disaster was Toronto's response to the outbreak of SARS, a case study from which many parallels to a widespread flu pandemic can be drawn. In a 2004 report by The SARS Commission[1], many factors contributed to widespread communication breakdown, leaving individuals and communities needlessly disconnected. One large contributing factor was the lack of effective methods for increasing capacity in systems such as hotlines, causing them to be extremely overwhelmed during the time of emergency. For example, although there was a staff of over 200 people working on the SARS hotline, the hotline received over 300,000 total calls, and peaked at 47,567 calls in a single day. This case study provides evidence for the huge demand upon hotlines that we can expect in a pandemic, as well as for the necessity of building a model in advance that will be better able to support extensive increases in capacity. The distributed volunteer workforce could potentially have been effective in reducing this flood of calls that overwhelmed the SARS hotline, by diffusing consistent information among a broader pool of volunteers.

Although there were many well-intentioned efforts and people arising during these times of crisis, there was clearly a need for better infrastructure, so that consistent, up-to-date information could be disseminated by a workforce that was better prepared to handle the huge surge of calls that inevitably arise during in an emergency situation.

Issues in the Status Quo

Thus, it is essential that during a pandemic the CDC, local health departments, and organizations such as the Red Cross have an effective method of disseminating the most up-to-date, accurate information to the public. They may also need a consistent system of collecting data from communities. Pandemic hotlines may be one of the most effective tools for accommodating this two-way communication.

In order to understand what hotline systems may best serve the needs of experts and the public, we first needed to better understand public health experts' current thinking for the use of hotlines in a pandemic situation. From our conversations with the experts, it is clear that from a national perspective, much of the responsibility to rise to this challenge is being delegated to more local governments. When we then looked at efforts occurring at a more local level, we were inspired by the innovative work of Seattle-King County, who are working to bring different hotlines and call centers together to better serve the informational needs of the public during a pandemic. Thus, Seattle-King County could be a model to turn to for other counties to understand and connect their local ecology of hotlines, and we may be able to add value by developing a model for using citizen volunteers. We believe this latter aspect to be critical, because we see the following issues in current pandemic hotline planning presenting us with opportunities for innovation.

Traditional call centers with many people in one building may not work in a pandemic. Call centers would be a problematic method of managing calls during a pandemic, as calls are routed to one central location where many volunteers are clustered together taking calls onsite, which could serve as a dangerous method of disease transmission. Furthermore, the general public will be receiving strict messages during the pandemic from their Health Officers to avoid congregating together in order to mitigate the spread of the pandemic, and thus people will quite justifiably be hesitant to work at call centers which defy one of the most basic protection strategies of social distancing.

No comprehensive model currently anticipates or includes volunteers. According to the Red Cross and Dr. Marty Fenstersheib of Santa Clara County Public Health Department, in past emergencies in the United States, many citizens have been eager to help out in any way they can. During the SARS outbreak in Ontario, they were able to create a successful yet overwhelmed hotline staffed primarily by volunteers. And volunteer-based organizations like Moveon.org demonstrate that people working remotely can be leveraged on a significant scale if there is interest, purpose, and enthusiasm.

No hotline in existence provides the breadth of information and services callers may need. Although hotlines put up by the Red Cross and health insurance companies provide some of the information callers may need, there is no hotline that integrates all the essential information that the public will need during a pandemic into one convenient call system. We anticipate a need for medical advice, as many people will not be able to afford or will not have access to a doctor or a hospital with available beds, and so any advice they receive may help to save their own lives or those of sick family members. We also expect there to be a significant demand for the most pertinent general information, such as information on preparation and home care, as well as timely local information, including restrictions on public gatherings, the status of resources such as food and water, and the current hospital triage criteria.

Currently, there is no comprehensive set of resources for hotline staffers or volunteers. In order to keep up with the demands of callers, volunteers or staff workers would need the most accurate general and local information, they would need adequate training for the software, hardware, and the specific problems they would face in a pandemic, they would need a sense of community, and they would need to communicate with technical experts for specific questions,

or mental health experts for dealing with the day-to-day stress of distressed callers. Additionally, little thought has been given to how to best motivate and empower citizens to volunteer during a pandemic, or how to keep hotline volunteers capable of working in the absence of Internet service or electricity.

Data gathering methods for hotlines are generally limited or out of date. One drawback to using many different hotlines is the difficulty in gathering data in a consistent, meaningful way. If a pandemic strikes, some of the best information about the incidence of the disease may come gathering basic information about a call.

Organizations such as the Red Cross and the Seattle and King County Department of Public Health have made significant strides in addressing several of these challenges, and their work has served as inspiration for many aspects of our innovation. We hope that our design, and the explanation of the technology that underlies it, will serve as a useful guide for these organizations and others in evaluating the different options for creating a pandemic hotline that will best serve the public.

A Potential for Innovation

From these issues in the status quo, we see several opportunities for innovation, and consequently several design variables that are important to consider in moving forward. We feel that any innovation should:

- **Not put workers or volunteers at risk of contracting the disease.** While we may still wish to use call centers, we want to focus on newer technologies, such as homesourcing, to distribute calls to people working safely from home.
- **Empower people with an opportunity to volunteer.** Considering the demands of a nation undergoing a time of potentially very prolonged strain, it would be very expensive to pay thousands of workers for the duration of an anticipated pandemic. In addition, volunteering for a pandemic hotline would be a safe and extremely rewarding way for people to stay connected to others, and truly make a difference in keeping people supported.
- **Address most of the needs of callers** and **forward them to other resources** if the hotline does not support a certain function, such as specific mental health information.
- **Provide all the resources to train volunteers and keep them updated** with all the most accurate and timely information.
- **Feed relevant information gathered back to the CDC or local health departments** to keep them well informed of current happenings.

A pandemic hotline could effectively promote the distribution of consistent information, and reach out to more members of a community. It can be implemented successfully by establishing connections between leaders in public health, technology experts, and communities. The technology to create a pandemic hotline and the methodology of building a workforce of home-based volunteers exists, and has already proven to be successful in various contexts. Thus, we see an opportunity for us to add value to pandemic preparation efforts by making connections

among sectors of society and building an infrastructure capable of supporting volunteers and callers.

The following report outlines in detail our innovation of a hotline staffed by volunteers working from home, describing our current prototype for the architecture of the hotline, as well as the experience for the caller and volunteer. It also explains the technology requirements behind the innovation, and what exactly it would take to implement a pandemic hotline as we currently envision it at a county, regional, or national level. For example, there is some design work that is critical to do now, before a pandemic is imminent, but it seems that there is no need to purchase or lease equipment ahead of time. These details can serve as a preliminary guide for local or national officials who may be interested in implementing a hotline, and need to have a clear understanding of the possible companies to work with, the costs of implementation, and the first steps to take in moving forward. We do not seek to develop something that is entirely different from anything that has ever been designed or used, but see value in building upon existing successful models and technology to create an innovative model that will most effectively keep individuals in a community as empowered as possible during a pandemic.

Innovation

Introduction

We envision creating a flexible hotline that would be designed using very current technology. The backbone of the hotline would be provided by companies with homesourcing capabilities, which we will describe in more detail below.

We want to staff the hotline with a combination of experts and volunteers. Experts would include people with medical experience, such as retired doctors, medical students, former nurses, and people who have staffed specific hotlines before, and would be able to help new volunteers understand the system. All volunteers, meanwhile, will be connected to these experts via chat rooms and community forums. Because it will be essential to get a great number of volunteers trained remotely and quickly, we currently envision volunteers undergoing e-training. They would be able to do this safely from home, and much more quickly than through on-site training.

It is critical that the call experience be designed well before the pandemic is imminent. The process of implementing these design choices may take a fair amount of time, which we simply may not have once the pandemic has broken out. As soon as the virus begins to spread around the world, people will have a pressing need for information, and we need to have a hotline ready as soon as possible to serve as a trusted source of information. In moving this process forward, we may be able to add value by working with public health officials and homesourcing companies to develop a design ahead of time, so that there is minimal work that needs to be done once the pandemic is imminent.

The call experience designs include whether the caller listens to self-service, pre-recorded information, which may be local or general, the list of subjects describing the information they may need, and where they are forwarded from this point. While many may have questions that

can be answered with pre-recorded messages, others will want to speak to a citizen volunteer or directly with a medical volunteer.

As callers get the information they need, we will also have to decide whether to obtain anonymous data, which could be compiled for use by health departments at the local and national levels. This data may help to track the spread of the pandemic, and thus help organizations to better understand and combat the disaster.

Architecture of the Hotline

In our solution, we focus on routing calls to volunteers working from home. The following diagram summarizes the overall architecture of the hotline:
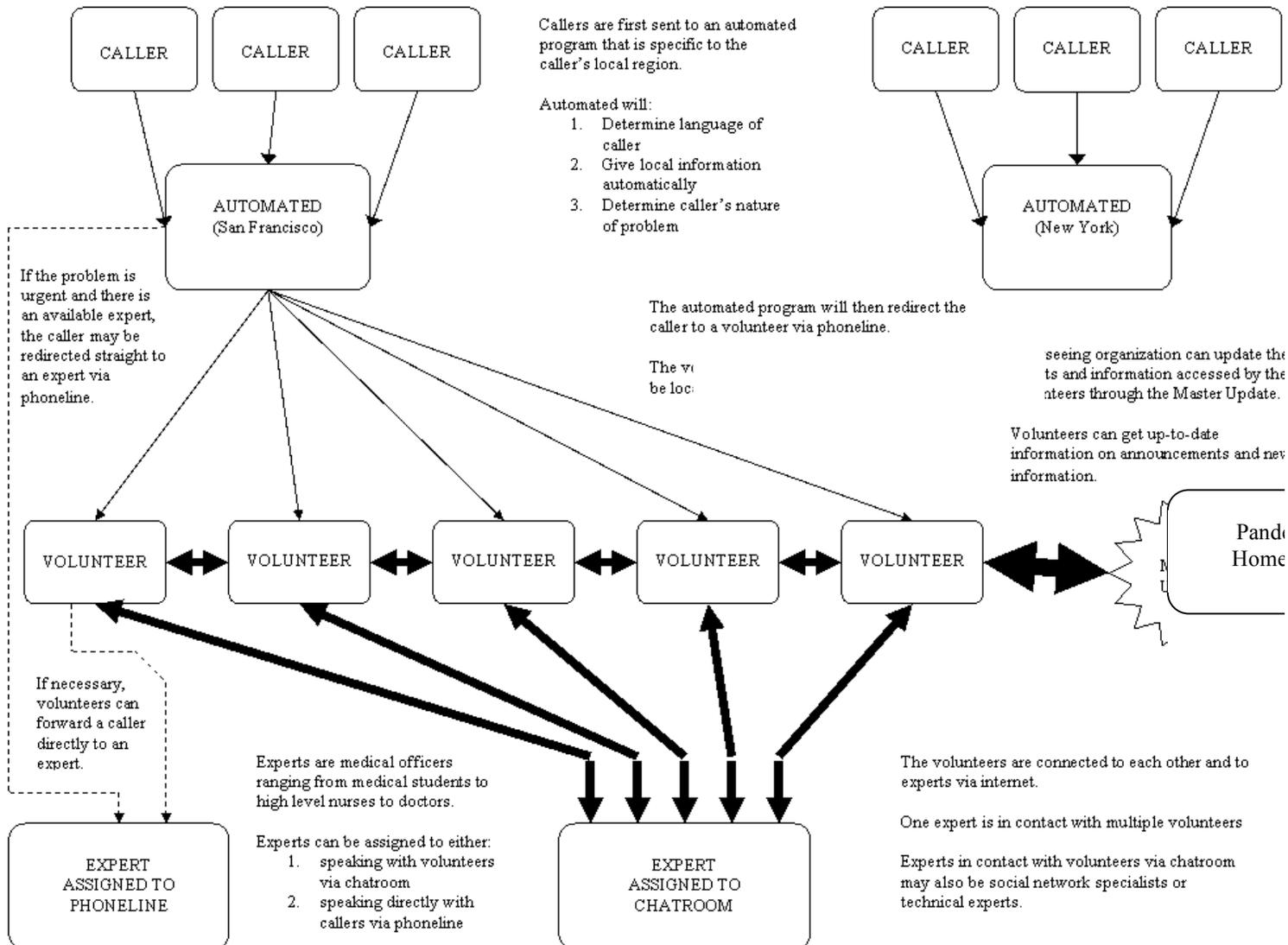
As shown above, there are three tiers in our current model:

Caller to Automated Message

The automated message guides the caller to input some basic information that will make the call a better experience, such as the language that the caller speaks most fluently and the reason for the call. Emergency calls can be routed directly to the experts, bypassing the volunteer who is equipped with more general information.

Another advantage of the automated message is that information can be gathered and evaluated. For example, if calls about food and water are prevalent in a certain area, local authorities can be alerted to attend to that specific need.

Callers inevitably will have to be put in queue to wait to speak to a volunteer. Some callers may become very impatient and give up on the call. For this reason, while the caller is waiting, they could be listening to the most updated local or general information. This strategy could also cut down on some of the calls routed to the volunteer, helping to reduce the potentially severe issues with capacity. Examples of information that may be recorded and relayed to callers are local closures of public gatherings, more detailed information on how the pandemic will affect people's daily lives, or strategies for coping with the stress of the emergency situation.

Automated Message Sends Caller to Volunteer

After the automated message helps to better direct the caller, the caller is connected to a volunteer. These citizen volunteers can assess the needs of the caller. We are hoping that these volunteers will be recruited through announcements on the Pandemic Homepage or on television, and we expect the most interest to arise during the period between when the pandemic breaks out in another country and when it reaches their local area. Volunteers would go through e-training and certification, allowing them to volunteer without ever putting themselves at risk of catching the virus.

The volunteers will be connected to the Pandemic Homepage, which will serve as their guide for serving the informational needs of callers. If volunteers experience problems with Internet accessibility, they would be able to consult a downloaded volunteer handbook. A printed copy of the handbook would be useful even if the volunteer had no electricity.
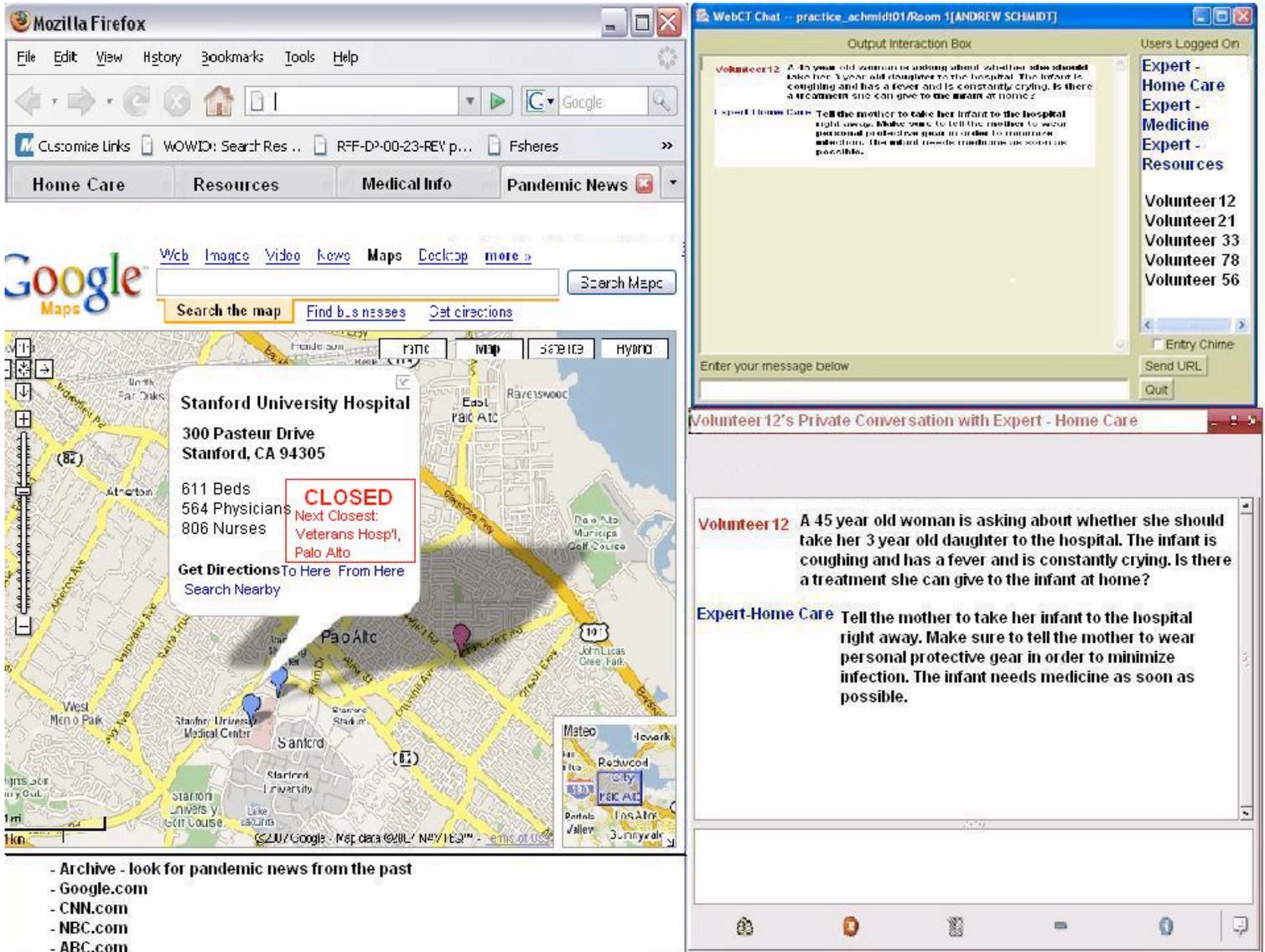
Volunteer Communication with Experts

The volunteers will be able to answer a great deal of the general questions that the caller may have, such as the most important steps to take to get prepared or the symptoms of this type of flu. However, because the volunteer is not knowledgeable in all aspects of the flu, the volunteer has access to experts in home care, resources, and medical advice.

Experts include volunteers with a medical background, such as medical students, EMTs, nurses, doctors, retired medical professionals, etc., and could also include psychologists, social workers, or other types of experts, depending on the needs of the callers. Retired medical professionals

and medical students could make for an especially large group of volunteers, as many medical workers will be overwhelmed with work during the time of a pandemic.

Here are two screenshots of the resources volunteers may have when assisting callers:

Screenshot 1: Stanford Hospital and Chat

Screenshot 2: News and Chat

On the left side, the Internet window shows the types of resources the volunteer may have. On the first screen shot, it shows Stanford Hospital with 611 beds and 564 physicians. However, there is no longer vacancy, and the volunteer can inform the caller that they should go to another hospital. On the second screen shot, it shows the most updated pandemic information that a volunteer would be able to navigate.

On the right side, there are two chat screens. The bottom one is a private conversation with an expert in medical advice – the volunteer can type in the situation, and the medical expert will promptly respond. This Question and Answer is also entered into the general chat room that is above. All volunteers and all experts in the area will be in this general chat room where they can view previous conversations in case similar questions are asked.

Volunteer Training Program

If calls are to be routed to call centers all over the United States, a quick and effective training program is crucial. The Hotline Team has looked at the Red Cross Volunteer Training program as an example of existing call center volunteer programs. The current volunteer training program consists of on-site registration, training using an extensive PowerPoint, "shadowing" an experienced volunteer and listening in on calls, and debriefs with mental health specialists and fellow volunteers. All of this occurs in a large room with 20-30 call stations. During a pandemic, it may be necessary to train volunteers through e-training, since large groups of people coming together to help others poses a risk to all members of the group. In addition, the event of a pandemic would necessitate volunteers to be trained as quickly as possible because the spread of the disease will be aggressive and rapid.

If the pandemic hotline successfully routes calls and allows volunteers to work from home over their home phones, it is important that we realize that volunteers may lack certain resources and support. We hope to recreate these resources by utilizing the Internet communication as a means to train, maintain, and support volunteers.

We have tried to reduce the risks that come with the pandemic through our volunteer plan. For instance, the following is a usage scenario of a typical volunteer, Philip Swift.

Philip Swift, a thirty-year-old banker from Denver, Colorado, is watching the nightly news with his wife and two-year-old son when a report begins streaming on the bottom of his screen. It reads, **"Are you willing to volunteer a small amount of your time to save lives without leaving the safety of your home?"** He is instructed to visit the **Pandemic Homepage** or call the **volunteer hotline** if he is interested. Intrigued, he goes to his computer and accesses the homepage.

- Philip reads an overview about the pandemic flu, consisting of the most up-to-date information from reliable sources such as the CDC, Red Cross and local health departments, and the need for volunteers to donate a small amount of their time to staff a pandemic flu hotline from their homes in the event of a pandemic. This hotline will reach out to the public, providing them with the most accurate and current information, and will be very important in reaching the vulnerable populations that do not have access to computers for information. The overview emphasizes the point that this is a good opportunity to stay **engaged and active** during a pandemic, but to also be **entirely safe** and **stay at home.**

- Feeling a sense of **civic duty** and **empowerment**, Philip signs up to volunteer. He is asked to provide some **basic information**, such as his **name**, **address**, **email address** and **occupation**, specifically if he has any **medical background,** or if he is **bilingual**.

- Philip goes through an **online training and certification** program in the hotline software, and is given special access to a **volunteer section** of the Pandemic Homepage, where he is instructed to **read and download** the latest information on the pandemic. He is also instructed to download the **volunteer handbook** to his computer and print out a copy for

backup, which is a compilation of a great amount of information on the pandemic, as well as all the different **scripts** corresponding to the anticipated questions the hotline would be handling. This handbook can be updated as necessary.

- As part of his training, Philip listens to **sample recorded calls**, and then is paired up with other volunteers to do **practice calls**, so that he can more thoroughly familiarize himself with the procedure and materials, and to practice delivering his information in accordance with the critical principles of risk communication. He also participates in **group conference calls** with other volunteers in order to build a sense of community among volunteers.

- Philip is added to a **hotline volunteer email list**, where he periodically **receives updates.**

- Philip is also now part of the **Volunteer Online Network** – an online community that allows all volunteers to have individual profiles, talk to one another through chat, post extra items or needed items in **volunteer forums**, and form **online groups**. This is where Philip is able to connect to other volunteers and discuss his concerns after his shift. In addition, he is able to read what other people have publicly posted to learn more about other volunteers' experiences.

- An additional advantage of being part of the online community is that volunteers will be debriefed in groups online (rather than going to the office). Every week at a set time, volunteers from certain groups will come together in a chat and discuss and give feedback. This meeting will be led by the **Mental Health Specialist (MHS)** who is prepared to deal with emotional and stress issues that volunteers may be dealing with.
    - o An additional responsibility of the **Mental Health Specialists** is to contact volunteers after their shifts. The MHS will utilize instant message private chat to talk about what happened during the shift and judge whether the volunteer was affected by the calls he/she received. If the volunteer is upset, the MHS is able to contact the volunteer through phone and talk about their issues so the volunteer has a comforting voice as support after a tough shift.

Usage Scenario

The following usage scenario illustrates in detail the full experience of a caller. The hotline in this scenario is on a national level, but would incorporate the same design for the most part for hotlines on a county or regional level.

Elena Loredo is at home in her small apartment in a predominantly low-income, Latino neighborhood in Berkeley, California. She is a single mother, raising four children and cleaning houses full-time to provide for her family. She is watching Telemundo one night, and finds that something about a pandemic flu is all over the news. She has no idea what this means for her and her family, and starts to panic. At the bottom of the screen, there is a **continuously streaming** message that says to go to a website or call a **toll-free number** for more information and resources. Because she does not have a computer, she goes to her phone.

- When Elena dials, an automated recording prompts her to press a number corresponding to her **language**. Next, she is prompted to press a number based on the reason for her call. More urgent calls, such as medical emergencies, are given **priority** and accelerated through the waiting process. This information is entered into a database, so that **frequencies** of different types of calls can be analyzed.

- Elena is now in **queue**, and because the software has tracked where her call is coming from, she hears an **automated recording** that gives her local information about where the pandemic flu is, its current status, and what she can do to prepare. The next recording is about the ten most important things she and her family can be doing to deal with the **stress** of this situation. Although this information is helpful, she still wants to talk directly to a volunteer.

- When Philip logged into the **volunteer section of the Pandemic Hotline** for his shift, he was able to read the latest updates on the information that he is disseminating, in the form of a **message and question of the day**, or a **daily email.**

- Elena is connected to Philip. Philip follows a detailed script on the Pandemic Homepage. To begin, he tells Elena that her call may be **recorded** so that information can be passed along to organizations such as the **CDC or local public health departments** so that they can understand the **specific needs of the people**. Also, this is a way to ensure that volunteers are doing a **high-quality** job. He then collects Elena's **basic information**, most importantly her **zip code**. This information can be put in a **database**, which could be sent to the **CDC** or other **public health organizations**, in order to build information on what types of people are calling, where they are calling from, etc.

- When Elena describes the nature of her call, Philip navigates the Pandemic Homepage to answer her question. He reads her the detailed script that responds to her question, which has been updated as frequently as necessary with new information from reliable sources such as the CDC, local health departments, the Red Cross, etc.

- If Elena asks Philip a question that he doesn't know the answer to, he can utilize the **expert chat room**. The chat room connects him to other volunteers, as well as **experts** who staff the chat rooms and respond to specific questions that arise. These experts could be **medical experts**, **technical experts**, etc. (See figure under Hotline Architecture) Philip can then later post on the volunteer **forum** about his experience and any problems he encountered or advice he wants to give other volunteers. This will help to build a **sense of community among volunteers.**

- Elena asks Philip if he knows where she should go to buy supplies such as water. Philip can enter her zip code into the **local information section** of the Pandemic Homepage so that he can look up directions to the nearest supermarket, or pick-up and drop-off area for supplies.

- If Elena has any more detailed questions, such as medical questions, Philip can try to answer what he can based on the script relating to these categories, but if the questions

exceed his knowledge, he can **transfer her to the next available expert** or take her number and **call her back**.

- Philip can also offer Elena the **numbers of different hotlines or organizations** that might be able to further assist her, such as counseling hotlines, ethnic or religious organizations, etc. Finally, Philip asks Elena to spread the word about this hotline to her family and friends, so as to capitalize upon the power of **social networking.**

- After Elena has been transferred or she has ended the call, Philip is free to take the next call.

The following week, Elena is watching Telemundo when a special report comes in, describing how the **Internet is inaccessible** in many parts of the country, including all of the Bay Area, New York City, and across Texas and Florida. There have also been widespread power outages across the country, and she is wondering if there are supplies she should be stocking up on to prepare. Again, she dials the toll-free number.

- After hearing the automated recording prompting her to press a number corresponding to her language, she is again prompted to press a number based on the reason for her call. She presses a number that corresponds to information for people dealing specifically with power outages, a new feature since she last called.

- Again, her call is routed so that she is given local updates and information, followed again by tips for managing stress.

- After receiving this information, she hears an automated message, explaining that due to problems with the Internet, she will first be receiving information from a **recorded message,** and that if she has any further questions that are not covered by the information she can stay on the line to be connected to a volunteer.

- The recorded message is very detailed and up-to-date, and gives Elena useful advice for coping with a power outage. However, she has some further questions, and so she stays on the line to be connected to a volunteer. This time, she is connected to Amy Goodwin, a volunteer based out of her apartment in Manhattan, who is able to access the Internet.

- Volunteers without Internet access can still be taking calls as well, as all volunteers have been instructed to download the **volunteer handbook**. While a volunteer may not be able to have the very latest version while he/she is without Internet access, it can serve as a good backup resource, especially for the information that stays more constant.

Moving Forward

The Immediate Utility

By building a strong hotline model now, with a very detailed model of the call experience, as well as the resources and support for the volunteers, we hope that this innovation can quickly be put into place once the pandemic hits.

It is important to thoroughly design the call experience now, but the necessary equipment can be leased or purchased from a capable company once the pandemic is imminent. Below, we describe the various types companies with homesourcing capabilities, and list some examples of each type. We then provide cost estimates we gathered from several companies for setting up a pandemic hotline at a county, regional, and national level. We hope this will be a useful reference for health officials or other organizations at any of these geographic levels.

Telephone Companies with Homesourcing Capabilities

There are four different types companies that are capable of setting up a pandemic hotline like we envision[1]. Some of the companies provide a **hosted model**, where you lease equipment from them that they host and manage and their locations. In working with other companies, you actually purchase the equipment, but they still manage it at their sites.

Network service providers are the familiar carriers, such as AT&T, Qwest Communications, Sprint Nextel, and Verizon. These companies often partner with equipment companies, and host this equipment that you would then be able to lease from them.

Independent hosted providers have their own capabilities, which may be more limited but faster to implement. You may even be able to work on setting up the design of the hotline yourself, as long as you are within the company's capabilities. These providers are often suitable for smaller companies that need these services. Examples of these providers are Angel.com, Contactual, Echopass, Five9, and UCN.

Contact center outsourcers are companies that have their own call agents that you can use for your call center. However, they are getting into the business of leasing their equipment so that companies could use their own employees as agents. Examples of contact center outsourcers include Electronic Data Systems (EDS) and IBM.

Equipment and enterprise application companies are the vendors of the hardware and software that route calls, such as Avaya, Cisco Systems, Nortel Networks, and Oracle. Currently, companies often buy equipment from them rather than lease it, but these vendors are starting to get into the business of hosting.

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[1] Forrester Research. *Hosted Contact Centers: Benefits and Risks.* November 7, 2006.

Modeling

To obtain high-level cost estimates from the telephone companies, we first roughly estimated call volume throughout a pandemic at the county, regional, and nationwide levels. From this we arrived at a rough estimate for the number of volunteers needed.

Parameters			
Pandemic duration (days)	540		
Volunteer			
Ave available mins per day	120		
Time answering calls	60%		
Ave call mins per day	72		
Estimates			
	US	Bay Area	Santa Clara County
Ave volunteer-answered calls per day			
3 min	420,000	9,900	2,300
10 min	79,000	1,900	440
Ave volunteers per day	28,000	670	160
Ave self-service calls per day			
5 min	210,000	4,900	1,200

Cost Estimates

We talked with four companies, summarized below, to begin to have an idea of the costs that would be associated with setting up a pandemic hotline at a county, regional, and national level. The tables below display the quoted cost estimates. (All amounts are in U.S. dollars.)

Network service providers: Company A (leased equipment)

Independent hosted providers: Company B and Company C (leased equipment)

Contact center outsourcers: We contacted two companies not listed above, but they do not currently provide the necessary services.

Equipment and enterprise application companies: Company D (purchased equipment)

Santa Clara County

	Company A	Company B	Company C	Company D
Initial set up charges	92,400	2,000	5,916	43,840
Ongoing charges (per month)				
Volunteer-answered calls				
Equipment usage or maintenance	2,400		3,053	680
Telephone usage	16,950		12,882	600
Total	19,350	1,582	15,935	1,280
Self-service pre-recorded calls				
Equipment usage or maintenance	3,200		700	110
Telephone usage	4,500		6,840	200
Total	7,700	840	7,540	310
Total	27,050	2,422	23,475	1,590
Total charges for 18 months	579,300	45,596	428,466	72,460

Bay Area

	Company A	Company B	Company C	Company D
Initial set up charges	390,015	2,000	12,588	198,000
Ongoing charges (per month)				
Volunteer-answered calls				
Equipment usage or maintenance	89,340		12,170	1,400
Telephone usage	73,050		16,802	1,800
Total	162,390	5,844	28,972	3,200
Self-service pre-recorded calls				
Equipment usage or maintenance	13,440		1,906	450
Telephone usage	18,375		8,452	400
Total	31,815	3,185	10,358	850
Total	194,205	9,029	39,330	4,050
Total charges for 18 months	3,885,705	164,522	720,528	270,900

US

	Company A	Company B	Company C	Company D
Initial set up charges	16,219,500	2,000	393,481	8,401,300
Ongoing charges (per month)				
Volunteer-answered calls				
Equipment usage or maintenance	420,000		429,179	60,100
Telephone usage	3,075,000		553,500	73,800
Total	3,495,000	164,000	982,679	133,900
Self-service pre-recorded calls				
Equipment usage or maintenance	570,560		81,667	19,240
Telephone usage	787,500		283,500	17,000
Total	1,358,060	84,000	365,167	36,240
Total	4,853,060	248,000	1,347,846	170,140
Total charges for 18 months	103,574,580	4,466,000	24,654,709	11,463,820

Conclusion

During a disaster, many people with the best of intentions will be eager to volunteer to help. Our goal is to channel these efforts into the most effective opportunities, one of which we believe will be signing up to volunteer for a pandemic hotline. This opportunity may be a good way to facilitate a sense of community among volunteers, which will be important during a period when people may be feeling especially isolated. The hotline can also empower the callers themselves by helping them to better support themselves and their families, and still feel connected to the rest of the community. A hotline will be especially important for keeping vulnerable populations connected and informed. If we do not have a source of communication for vulnerable populations, we will find ourselves facing the same ethical questions of racial and class disparities that we faced after Hurricane Katrina. However, if we do build this safety net to support vulnerable populations and the American people as a whole, we may instead be looking back at the pandemic of 20XX, knowing that we reached out to as many people and saved as many lives as possible.

We cannot change the reality that a pandemic is inevitable. However, we see great potential for changing the reality that our country is severely under-prepared to handle a pandemic on multiple levels and across sectors. By bringing many different sectors into communication while connecting existing technologies with the efforts and people preparing for a pandemic, we can successfully create an infrastructure of support that accounts for all individuals in a community, including the most vulnerable. If we draw upon our deepest sources of creativity and innovation,

and bring forth our sense of civic duty in our planning for a pandemic, we will not only be better prepared to handle this emergency, but also be more connected, empowered, and resilient individuals and communities as a whole.

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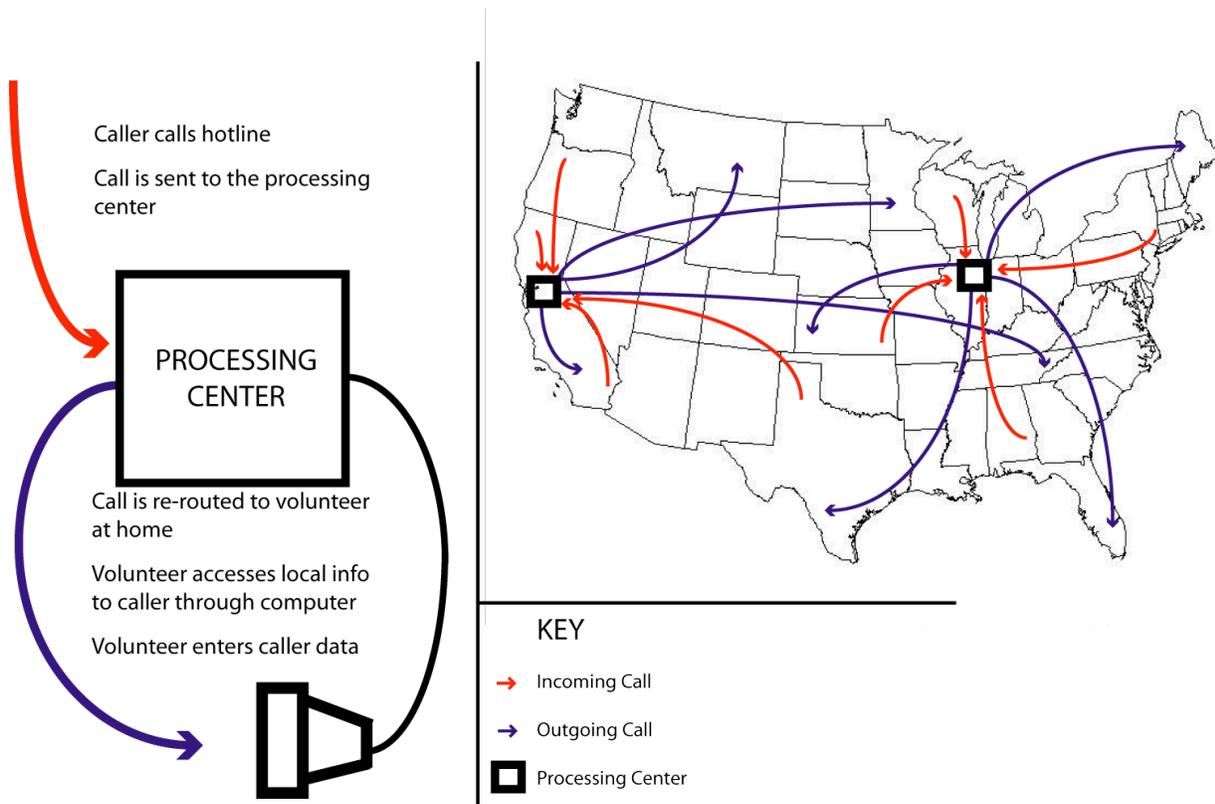**Maritza Villagomez, Call Center Manager, HELPLINK**

Diane Young, Educator Consultant, Public Health – Seattle and King County

We would also like to thank the experts from the companies with homesourcing capabilities for their help in understanding this technology and its effective application.

Sources

The Honourable Mr. Justice Archie Campbell, Commissioner. <u>The SARS Commission Interim Report: SARS and Public Health in Ontario: An Executive Summary.</u> Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science. Mary Ann Liebert, Inc, 2004. 6 June 2007. <http://www.libertonline.com/doi/pdf/10.1089/153871304323146423>.

Appendix

Caller calls hotline

Call is sent to the processing center

PROCESSING CENTER

Call is re-routed to volunteer at home

Volunteer accesses local info to caller through computer

Volunteer enters caller data

KEY

→ Incoming Call

→ Outgoing Call

□ Processing Center

Homesourcing: A person calls in and the call is routed to a volunteer working from home.