Using HealthMap's Web-Based Risk Analysis Tools before and during Public Health Emergencies

Host:
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Moderator:
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Presenters:
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Teresa (Operator)
Welcome and thank you for standing by. At this time all participants are in a listen-only mode into the question-and-answer period. If you would like to ask a question at that time, please press star than one on your phone. Today's conference I'd like to turn it over to Callie Campbell. You may begin. (00:00:27)

Callie Campbell
Thank you. Welcome to the Using HealthMap's web-based risk analysis tools before and during public health emergencies webinar, hosted by the Centers for Disease Control and Prevention. My name is Callie and I am going to walk everyone through the procedures and tools available. This webinar should last approximately one hour. If you have a question for one of the presenters you can use the Q&A button, located at the top left portion of your screen. Just type in your question and hit enter to send a question to the presenter.

At the end of the session selected questions will be read out loud to the group. At the top right-hand side of your screen you will see a feedback tool that has a colored square next to it. If you select the drop-down arrow next to the feedback you can alert me if you have trouble hearing or if you need help. This meeting is being recorded. If you have technical difficulties at anytime during this presentation, you may call our technical support line at 1(877) 283-7062. Thank you all for coming. Susan Dugan is your host and she will be taking over the presentation from here. (00:01:26)

Susan Dugan
Thank you. This is Susan Dugan. I am with the emergency risk communication branch in the division of emergency operations at the CDC. We are very happy today to have you join us. David Scales who is an MD and a PhD, a medical sociologist and a research fellow in Boston, Massachusetts. He's with the Children's Hospital Informatics Programs HealthMap. This is an online tool for real time epidemic surveillance and it is available for free. It is a web-based and a mobile app. David recently joined us for a partners meeting at the CDC and we really enjoyed his information. I hope you will too.
We have two modes of communication at the end of session today. We will be taking questions and answers, we will be taking questions, David will provide the answers, both verbally and through the webinar. The operator we will alternate between your audio questions, the instruction sheet is given for that, and with Callie for your written questions via the webinar. So with that, please welcome David Scales. (00:02:36)

Dr. David Scales

Thank you very much Susan. First I want to say thank you to the CDC and thank you all for joining. It is a fantastic opportunity to be able to discuss some emergency health preparedness with all of you. I hope everyone can see the screen okay. I just want to point out to everyone my email address which is at the bottom there. It is david.scales@childrens.harvard.edu. And this is a little bit of a one-way communication at this point. But, I look forward to being able to continue this conversation with any of you that are interested in it. So, please make note of my address. I'm happy to talk to you more. (00:03:14)

With that, I'm going to start the presentation. I would like to talk a little bit today about HealthMap, what it is and what informal epidemiological surveillance actually is. I'm going to talk about some of the projects that we've had regarding anticipatory epidemiology as well as some of the projects that we've done incorporating what we call participatory epidemiology. Then using that I'm going to talk about how we've applied these principles to epidemiological disasters and I'm going to talk specifically about the little bit of experience we had with the Haiti Cholera epidemic working with collaborators down there on the ground. I'm going to talk but the lessons we learned from that project and how we are applying them in future direction specifically with the project we are working with the CDC on called Bio Mosaic. (00:04:05)

So what is HealthMap? HealthMap is a project that is designed to track epidemiological information in virtual real-time using informal sources particularly from newspapers and other web based text platforms. The reason we do HealthMap and we collect all of this epidemiologic information is because the upgrades that you are seeing on your screen are outbreaks that have occurred all over the world, from 1996 to 2009. There's a vast number of outbreaks. In our database of these outbreaks these are simply ones that were reported to the WHO. We have right around 300 over this time. Outbreaks are a significant enough concern where we recognize the importance of catching them as early as possible. Using online bio informatics processes to do that has been successful so we are applying our process to public health information reporting. The reason we are doing that is because public health reporting has traditionally been a pretty cumbersome process. There are those of us that exist in the public and if we get ill we go to a healthcare worker, we go to our doctor, and information has to be shared among healthcare workers and public health practitioners before any sense of an outbreak or epidemic is known. When there's the hunch that an outbreak or an epidemic might be going on that information gets reported to local health officials and confirmatory reports need to come from laboratories. Only then is information passed up the chain to the Ministry of Health or to larger governmental bodies such as the CDC or the World Health Organization. (00:05:53)

So our goal at HealthMap is to change that. Our goal is to really try to act as the center of a wheel of public health practitioners all coming to a place like HealthMap to get and share epidemiologic information about outbreaks and other events going on in the community. So we see ourselves as trying to be the communication conduit between these different networks of people as they try to find out information about public health and emerging epidemics. (00:06:28)

So the reason we do this is because time has shown that over the course of the past 15 years the amount of time that it takes for an outbreak start to be reported to the World Health Organization has declined dramatically through the work that HealthMap and other partners that are using similar information gathering techniques are using. What this does is it allows the gathering of information and sharing of it much more quickly bringing the average time that it takes from outbreak detection to reporting to be decreased dramatically. As you can imagine, this has dramatic effects in terms of the number of people that get infected before public health interventions can be effective and help reduce the spread of an epidemic. (00:07:18)

So how do we do this at HealthMap? So our website, what we do is we acquire, via RSS feeds, articles primarily from newspapers and other media sources scouring over 20,000 sites every hour, 24 hours a day, seven days a week. We get more than 600 alerts per day from 22 different sources and by sources I mean a feed and that's an RSS feed. One of our sources is Google News, for example. But within Google News, there's thousands of media sources. This is how we are pulling all the information in. This is a little bit of an old slide, we are actually working in 8 different languages now. We also have Mandarin Chinese in addition to the French, English, Spanish, Russian, Portuguese, and Arabic. We have both traditional

and simplified Chinese that we are pulling media reports from. And we function by gathering this information in multiple countries and territories in well over 175 disease categories and we do this for both human and animal diseases. (00:08:25)

Next we extract information from these articles in an automated fashion. We have multiple disease patterns that we are looking at and we have a database of different locations and we extract the information about diseases or even syndromic information such as school closures and match that to the location that we extract from the article. (00:08:46)

Then we take that information and we try to categorize the articles on whether or not that news is really important in which case we would label that as breaking or whether or not it is a warning such as perhaps there's lots of unsanitary incidents going on and there is a suspicion that an epidemic might be starting. Or that a hurricane is expected to be landing at a certain place. Then there's information about old news such as reports about smallpox epidemics from 1972 or context, just describing articles about how you can reduce your weight or other information that is not particularly related to emerging epidemic diseases. Then there's information that is not disease related that our system picks up such as epidemics of corruption or rotten politicians or articles that often appear in our system that we have to weed out. (00:09:38)

We weed out the articles that don't belong on a map and we take the ones that do and we do a ranking sort of a Netflix ranking based on what seems to be most important based on previous articles that seem similar. We take that information and we put all that information on our map. We do this every hour, on the hour. Even when you are not watching, overnight we have people in Europe, we have people in Asia that are using our system and so the fact that this system is automated is really helpful for people that our using the system in different time zones. We do have a human element and that human element is a certain amount of curation. Particularly in some of the new languages that we've recently started to work in such as Arabic, Portuguese and Spanish, we have a public health expert go through all of the reports that come in and nothing goes on a map in those languages until a human has looked at it. In the other languages such as English and French, we have a very high degree of accuracy over 95%, occasionally we have to go back and make some adjustments, but overall for an automated system we think we are doing quite well. What you end up with at the end of all this is you end up with HealthMap the website. And for those of you that are familiar with HealthMap you might notice that this website screenshot looks a little different than it has recently. We've just released a HealthMap 4.0 and this is the website you are looking at. If you look under the HealthMap logo you can see HealthMap Global which is the map that you are visualizing right now. But you can also click on HealthMap Local which is a site that we have that helps give people their local disease forecast is what we like to call it. And then there's HealthMap News which is the disease daily, where we report on information and outbreaks that is of particular relevance to the emerging epidemic community. (00:11:42)

Also, I want to point your attention to the upper right where there's a tiny little video that says what is HealthMap? That's a video that we had made recently that goes through much more quickly actually, the description of what HealthMap is and what it does. It is quite cute. I recommend if you have a moment today to take your coffee break and have a look at that. (00:12:06)

In order to get the best usage out of HealthMap I want to direct everyone's attention to the advanced search. If you look at the HealthMap website that is right next to the search bar. The advanced search is usually the best way to get the functionality out of HealthMap because it allows you to sort by different diseases, different locations, and different feeds. Once again, as I mentioned, the feeds are things like Google News that contain thousands of sources or something that's only one such as the World Health Organization. And these feeds vary in terms of how official they are, as official as you want to get like as the World Health Organization is, or there's even information coming from users like you who submit information about outbreaks. If you're a public health professional and you want to have only the official information you can search for it using the advanced search. You can also sort by time period as well and that allows you to only focus on the time you are interested in if you're interested in only the recent time or trying to do some historical comparisons. We have HealthMap data that goes back to 2008 so it gives a decent frame of reference over that time span. (00:13:24)

Switching gears a little bit I would like to talk about some of the projects that we've had that have incorporated anticipatory epidemiology and participatory epidemiology. Then after I've done that I'm going to get into the specific examples where we've utilized those platforms for epidemiological crisis response. (00:13:46)

Some of the projects that we've done regarding anticipatory epidemiology, it is based on the idea that there are certain times where you can predict that outbreaks are more likely to happen than others. The most obvious of these is at mass gatherings, these are times when people are going to be traveling all over the world for some sort of migration or event. As you can see on your screen, the Olympics is an obvious example where people are going to be coming from all over the world, not just athletes, but millions of fans to come and enjoy a certain experience over a period of weeks. Working with our partners at BIO.Diaspora we were able to obtain from them information on travel patterns over historical periods to get a sense of where might people coming to view the Olympics where might they be coming from. Using this additional data we enhanced our surveillance techniques and we were able to detect cases of measles that were originally in Sydney Australia that due to travel related to the Olympics, there was a measles outbreak genetically related to the strain in Sydney that ended up in Vancouver. We also saw a similar situation when we were doing surveillance for the World Cup, again with our partners at BIO.Diaspora. We were able to pick up, after the World Cup, that there was some measles in South Africa that ended up being transported to Argentina. (00:15:18)

Being able to do some really in-depth surveillance at mass gatherings, seems to have a certain amount of additional value. Particularly when combined with layers of information from our partners. We've incorporated a few more of these layers in our Hajj website. This is a website that we put together last year for the Hajj, which included information that might be a little bit difficult for you to read on the right there, but it shows travel patterns to Mecca, once again provided by our partners at BIO.Diaspora. It highlights the 10 countries with the highest number of expected pilgrims, and if you wanted you could also highlight countries with at least 20,000 expected pilgrims. The concept here is, we know that people are going to be going to the Hajj, and we can predict with some degree of accuracy where they are going to be coming from. If we can do detailed epidemiological surveillance in the areas where pilgrims are coming from, we might be able to predict what epidemics could spread at the Hajj. So this is anticipatory surveillance. (00:16:26)

Next I'd like to talk about participatory surveillance. What we've done here is, Susan mentioned that HealthMap has a mobile application. It is a mobile application that's available both for iPhone and Android phones that allows users to submit information related to diseases or outbreaks that they see going on in the community. And this is information that you can submit either by providing us with the URL of a news report that we have missed, or in certain cases, you can submit a photo of a relative or a friend that is sick, or just discuss a situation that you heard about in the community because the school closed or other information that you've seen on our website that we don't have. And the utility of this, now we hear a lot of complaints that the signal to noise ratio is very high, that might be true, but the utility of this is that this is the kind of information that we see in this idealized epidemic curve. This is the kind of information that's really at the forefront of this curve. We've been doing a good job by picking up online news reporting, but this is relatively late in the game. By the time an epidemic appears in a newspaper it is taken off enough to a point where people are concerned about it. True epidemiological surveillance, if it is doing a really good job, might be able to pick up some of this information at the very start of the epidemic when people are chattering about it in social media platforms. (00:17:58)

How we've been trying to engage users with this is not only with our OutbreaksNearMe application, but also with our OutbreaksNearMe Facebook application and now you can see the little, cute little bugs that I've been using for my banners. This is information that functions very similarly to our mobile application which users can submit URLs or they can submit personal information. Once again, this goes into a particular feed that for those people who are only interested in official information, they can easily exclude this information from appearing on their HealthMap as they view it. (00:18:41)

This is the OutbreaksNearMe application. I encourage you if you have one of these phones feel free to download it. We are hoping to have a second version at some point in the near future to weed out some of the bugs from the first version. But it is a fun application to play around with. (00:18:58)

And one of the points I wanted to discuss is addressing the issue of signal to noise ratio. It is an issue when you are dealing with social media because we are not necessarily restricting what people report. And so it is more of a situation where the buyer must beware. This information can in certain instances such as the one that I'm showing here, it can be correlated with more official information and what you see on your screen right now is OutbreaksNearMe application submissions. Normalized per number of downloads compared to the sentinel physician network which detects influenza like illness, it is an index at the Centers for Disease Control. We actually found a pretty high degree of correlation between the submissions that we were receiving in our application compared to this influenza like illness. This was right at the peak of H1N1. During epidemiological crises there seems to be some utility to using some of this crowd sourced information. At other times however, such as trying to detect it at baseline or right at the start of an epidemic, that's a little bit more of a challenge. That's something we are continuing to work on. (00:20:22)

One of the ways we're doing that is we are also trying to incorporate information that's coming from other partners in particular, not just anybody out there that happens to have an iPhone, but we have an application called Outbreak MD. And this is an application that is available free on the web. What it is, it's a little bit more of a specialized platform so that physicians or other health professionals can input data in a more, in a fashion that requires a little bit more expertise. This is a platform that we would not be expecting just an uneducated person who happens to come across our application in the iTunes store, this is an application we expect public health professionals to be using, particularly on the ground. The benefit of using HTML five is that this is a platform that can be used on mobile devices and HTML5 has a very useful feature, where even though this is a website, what HTML5 does is it allows the user to input data and it is stored on the local hard drive until the user is able to get to an Internet connection. So once the user gets to the Internet connection HTML5 recognizes it and is able to upload all of that data at once. So we have some success using this with a pilot project in Haiti, in which we had a couple of people on the ground using our OutbreakMD application and submitting data about cases just post the earthquake. And the benefit of this was, we also had this deployed when the outbreak of Cholera happened in Haiti and so we were able to pick up the first five cases that reached Port-au-Prince via our OutbreakMD system. (00:22:18)

I apologize, we seemed to have switched. We are back to the presentation. Okay. Switching gears. Now, I would like to talk about how we have taken these principles of anticipatory epidemiology and participatory epidemiology and how we've been applying them to epidemiological disasters. I'm specifically going to talk about the Haiti Cholera epidemic. (00:22:44)

In terms of a timeline, the Haiti Cholera collaboration that we were able to put together, it started because on October 20th we picked up a report that there were two cases of an unknown diarrheal illness in Haiti. Unfortunately these we are the original cases that turned out to be the start of the Cholera epidemic. We had some partners that were working on the ground in Haiti. On October 22, we had a Skype telephone call to set up a collaboration. At the time we didn't even know what we are going to be creating. But we had a call where we talked with Crisis Mappers and Humanity Road and tried to figure out some sort of framework where we could share data and decide what needed to be on a risk analysis platform that these users could use on the ground to be able to easily visualize their data. And to be able to do it with information that was collected dynamically, almost in real-time. So by October 23rd, we had our partners at Humanity Road using OutbreaksNearMe and using OutbreaksMD to report new Cholera cases. And by 7:00 p.m. that night, we had a live site with information that we were extracting from the Google spreadsheet that we had set up with our partners. (00:24:06)

This collaboration came together surprisingly quickly. It was done using tools that as you can see on the right were all free. These are tool I imagine that a lot of you on this call are well aware of. It is tools like Google docs, Skype, Twitter, and other partners' tools such as Crisis Map, Crowdmap, and even including some of our tools such as OutbreakMD, and the HealthMap website itself. This is a collaborative

tool that came together quite quickly and relatively easily because it did not require much greater overhead than what the partners were already using themselves. (00:24:50)

So we were able to bring all this together so quickly in part because of the tools that we were using and also because we were able to, in a very automated manner, extract the information that was provided by our collaborators on the ground. And this is information it might be difficult for some of you to read so I can read some of it, but this is just a snap shot from the Google doc that we had, where some information was coming from International Medical Corps and other official sources such as PAHO but it was also coming from Twitter. It was coming from various users, it was coming from people reporting on the ground, it was coming from our collaborators themselves. And we set up the system so that it was extracted in an automated way and that it was put on our interactive website. This included data on multiple different layers that had epidemiologic information, both from HealthMap, from our partners, and from Twitter that was coming in. It had information coming in on safe water installation, it had information on the health facilities, Cholera treatment facilities and all the information was information that was coming in at the time. There was only one piece of information that one of the partners had in advance and that was the health facilities. They were able to give that to us and when we first went live with the site we had information on the health facilities that had been functioning in Haiti. But all of the other information was information that was updated dynamically by our users at the time. The benefit of the Google doc is that the users if they have any questions about the data, they could go back to the Google doc and be able to see the exact context. Or, they could see the context on our interactive map. It is an interactive map so what you are seeing here, it is unfortunate because it is only a snapshot, but imagine a map if you would like to go to that website you can view it, and you can start playing around with it, there's much less information on it now because the epidemic is still going on but it is much diminished from previous. But you can zoom and you can pan and you can dig down into specific areas of Haiti that you're interested in. And looking at the layers on the right side you can click on one layer that will show you new safe water installations. Those are the blue dots you see on your screen. There is also water points, or the Haiti health facilities which you could be able to see, or the Cholera treatment facilities. Those appear on your map and those change dynamically as they were updated by our partners on the ground. Since this is interactive, if you're interested in any one particular event that you see there, if you're interested in a safe water installation, you can click on it and get information that was information in the Google doc that tells you when that was updated, how it was updated and any other information regarding that installation that was put in the Google doc. So while this is crowd sourced, it allows the user to be able to see whether or not that information meets their own personal criteria. By allowing interactivity we are not saying that we are deciding what's important, we are putting the information on the map so that users can decide whether or not they think it is important and whether or not they think it is of actionable worth. (00:28:16)

So this is a collaboration that we found quite useful and our partners on the ground said it was quite useful for them as well. There were a lot of lessons that we learned. One of them was that identifying, acquiring, and incorporating key data is something that requires partners. The more that it is done prior to a crisis, the better because there's a lot of information that can be collected prior to the crisis that can just be mobilized very quickly in the event that a crisis does occur. Then during the crisis there's a lot more information that needs to come, that is very crisis specific. You need to have partners on the grounds be able to update this information as fast as possible. This is where social media comes in. Because using things like Twitter sounds informal, but Twitter, Facebook, any sort of message service that gets information out there, it can be incorporated into a system that can be extracted and put onto an interactive website like this. But the important thing to recognize is that it is just one of many data sources. This is information that it is uncorroborated, it is coming from particular people, some of whom are in the aid community, some might not be, but it requires the user to have some discretion with how they use that information. It also has the ability to be corroborated by other information. We like to think that if we have physicians using OutbreakMD and we have crowd sourced information coming from other sources such as Twitter or Outbreaks Near Me, then that information can be corroborated and if you have information coming from both physicians and from the crowd, then that probably gives it a little bit more credibility. (00:30:05)

Lastly, one of the most important points that we took from this collaboration was the need to spread the word because unfortunately, there's probably a number of people who are on this call, who were working in Haiti, or working on aspects of the Haiti response who probably have not heard of our work on this Haiti interactive platform. Unfortunately we take a lot of the blame for that because while our partners on the ground were working to spread information there, we did not get the word out as much as we would have liked and since then found a number of people who were working in this arena that did not know about our website. We are going to, in the future, make sure that we can incorporate more information on reaching out to other partners even after we've created a collaboration. (00:30:58)

I just want to stress one point, and that's the point made originally by CrisisCommons at the embedment conference that Susan mentioned at the beginning of this call. CrisisCommons talked about how data can be structured before, during, and after a crisis. There's a lot of information that can be collected in anticipation of a crisis. This information can be anything from demographic to infrastructure. Including situations such as weather or other reports that can be aggregated prior to any event happening. But then when a crisis actually occurs you have information that needs to be rapidly mobilized. This is information that is very crisis specific. Hazard identification, in the case of the Cholera outbreak in Haiti, had to do more with water than anything else. It also had to do with being able to identify shelters because soon after the Cholera outbreak started there was a hurricane that came through. It has to do with resource management, being able to find safe water sources, being able to know that what information you are disseminating out to other aid agencies is true. This public safety reporting is extremely important in the middle of a crisis. And this is the kind of information that we found extremely important because we would not have been able to do it ourselves. The kind of information that you need to be leveraging your networks in order to create. (00:32:28)

This information and this structure of information is how we are approaching a new project that the CDC has been funding. It is a project that we call BioMosaic. This is a project that is focusing on creating an online interactive platform, that uses pre-existing data and indicators much like I mentioned previously to make it easily accessible and ready for public health professionals at the CDC to be able to use this in the event of a crisis. And, we hope, to be able to add additional data depending on the crisis at hand. The data that we are starting off with is based on these principles that you see right here. It is based on demography, migration, and health. Particularly because we are interested in infectious diseases, these are three axes that are extremely important for the spread of infectious diseases. All of these data are structured around foreign-born populations that live in the United States. (00:33:31)

Why foreign-born you're probably asking yourself right now? The reason is in part because the CDC Division of Global Migration and Quarantine is funding this project. Their mandate is to make sure that the health of foreign-born populations living in the United States is addressed. In addition to that from a sociological perspective, foreign-born, as a classification, often is a much better indicator of disease than concepts that are little bit more slippery. Race for example. In the United States we've traditionally used race to try and stratify different vulnerable populations in populations at risk. We are finding that race is a complicated category so is socio-economic status. There's a lot that is difficult to tease out when you are using these as you're primary indicators. Foreign-born however, has a little bit more, I guess you can say it is a little bit more objective, in the sense that this is a category that even if you do become an American citizen you are always classified as foreign-born. Even if you are a naturalized citizen. The important aspect of that is even if you are a naturalized citizen, there's certain aspects of risk that you continue to have even over time. Particularly with infectious diseases. Foreign-born populations over time the risk for infectious diseases go down. Usually when a foreign-born person arrives in the United States they are going to have a risk for infectious diseases equal to the risk of infectious diseases in the location where they left. This risk will decline over time. Until, at a certain point it gets extremely close to the levels that a native born American would have. Except in certain situations. Tuberculosis; the rate of tuberculosis is always higher in foreign-born populations regardless of how long they've been in the United States. (00:35:33)

Also, there is the suspicion that migration plays a factor in the elevated risk for infectious diseases for foreign-born population. In particular, there is frequent visits to or from the home country as well as visitors from the home country that might be visiting. But this isn't just a situation where foreign-born

populations are at greater risk for disease. In the United States they are actually at lower risk for certain chronic diseases. Foreign-born populations when they arrive in the United States have lower risk for diabetes or obesity. But that risk actually increases over time as an acculturation process occurs. So the longer a foreign-born person has been in the United States, the more likely they are to have diabetes and obesity closer to their surroundings depending on what state they live in. (00:36:27)

So the foreign-born is a very good population to look out when you're looking at vulnerable populations in the United States. So using that same data structure that we learned from CrisisCommons and we learned from our Haiti project, we structure the data we are try to create in this platform along these different lines. We have information on demography that's coming from the U.S. Census. We have information on migrations coming from a few different sources and health information, primarily infectious disease information that's also coming from a few different sources. We are looking to her CDC partners at the Division of Global Migration and Quarantine to be able to provide for us more information before the crisis as well as information if a crisis occurs regarding hazard identification and resource management. This is, as you can see, this is the platform that we are trying to incorporate into future web-based risk assessment platforms. (00:37:26)

So what you can see here is just a couple of examples of some of the mapping that we've been doing of census variables to be able to drill down and identify vulnerable populations. This is vulnerability based on particular income, or education rates, as well as fertility or linguistic ability, because as you might imagine, if you have difficulty speaking English it makes it more difficult to get certain types of health care or access to certain services. (00:37:56)

The migration information that we have is once again coming from our partners at BIO.Diaspora. And we're also incorporating other information such as secondary migration, where these international travelers are coming from, as well as border crossing statistics at the various different border crossings in the United States. (00:38:19)

The health information; we have our HealthMap events which once again are stratified according to feed so that the user will be able to choose how official or unofficial they want their information. And it is updated every hour just like our HealthMap system is. It allows the user to choose what type of diseases they are interested in using the advanced search I mentioned. And we're also hoping to be able to incorporate geo-spatial queries so that users will be able to define geographic regions and see what kind of health migration or demographic characteristics are within the user defined location. (00:38:58)

We are also looking to incorporate any other information that our partners are looking for including information on tuberculosis, obesity, diabetes. This is the kind of system that is easily adaptable to more data as long as we have it in advance. (00:39:12)

This is a snapshot of the web-based platform. As you can see this is putting the map into action, just the maps that you saw previously, this is enabling users to drill down a little bit more deeply and get more specific information on counties that they are interested in. We've also been developing an iPad application in case there needs to be mobile users that access this platform. And as you can see on the left, there's different maps that are there to help the user identify vulnerable populations. And there's additional functionality that users are able to use. Like any iPad application you can zoom in, zoom out, you can zoom the map, you can pan the map. And you can also identify specific counties getting more information from these counties on particular variables that are of interest to you. Ultimately we hope to, we have this data currently at the county level. We are hoping to incorporate information at the tracked level as well that will automatically be seen as you zoom in closer on the map. (00:40:22)

In summary, I want to mention that HealthMap is a web-based intelligent system that we've primarily been using for epidemic intelligence. But it is a system that can be easily adapted to other situations. We've adapted it to situations that I described using anticipatory epidemiology. But we've also incorporated other data sources using participatory epidemiology such as OutbreakMD or OutbreaksNearMe. These platforms allow us to bring in additional data that can be leveraged by our partners when we start collaborating in situations for crisis response. The partners aspect to this cannot be understated. Having partners on the ground that are able to provide solid data that we can incorporate into our system is essential. These systems, they can look very nice particularly online when you're interacting with them,

but they are only as good as the data that's provided by our partners. Then finally I just want to stress that these types of collaborations can be rapidly mobilized. It took less than three days for the Haiti collaboration to come together and it is a situation that in the event of a crisis we would be happy to work with those of you that our working on the ground to be able to rapidly respond to any crisis that are currently developing. (00:41:49)

Lastly, I would like to thank everyone at the HealthMap team, who have done a lot of work bringing these slides together. With that, I'd like to invite any questions. (00:42:04)

Callie Campbell
Okay, great. I have one question from the webinar system right now and before I get to it I would also like to announce that the Q&A at the top of your screen is where you can ask questions. The operator can also take questions. I believe by hitting *1, is that correct?

Teresa (Operator)
Yes, that is correct. And record your name. (00:42:24)

Callie Campbell
Okay. First question, this is a fantastic tool and the questioner was asking can this tool be appropriately used for environmental events like toxic spills, etc.? (00:42:38)

Dr. David Scales
That's an excellent question. HealthMap generally tracks environmental events. If you click on the advanced search you will be able to locate by different diseases. If you scroll down you'll be able to see there are environmental events so we do track toxic spills and other environmental events such as that. We had a website similar to the ones that I've been talking about for the Gulf oil spill. This is a platform that can absolutely be adapted for environmental spills, whether they be natural disasters or if they are spills or toxins or any other type of environmental event. (00:43:27)

Callie Campbell
Okay, operator, do we have any questions on the phone right now?

Operator
We have no questions at this time.

Callie Campbell
Okay. I'm seeing no questions in the webinar system right now.

Susan Dugan
This is Susan. I'd like to give it just a few more minutes. David, we so appreciate your time and there's just a wealth of information here. I very much appreciate your explaining some other things that you're also doing with CDC. Again, how important the other folks, the community level information and other partners, how important they are. I want to encourage questions and if you don't have them at this time we can scroll back to David's information again. If you wouldn't mind putting that side back on, David, so people could indeed contact you, which we do encourage. This presentation will be archived on the emergencyCDC.gov\CIRC, which stands for the Crisis Emergency Risk Communication page. On the emergencyCDC.gov\CIRC page, you will be able to find a recording and an archive of this presentation. Are there any other questions at this time? (00:44:49)

Callie Campbell
We are starting to get some through the webinar system, though. Let's see, the first question we have says thank you for the presentation. Are there any plans for a BlackBerry compatible mobile application? (00:45:03)

Dr. David Scales

That's a great question. Right now, we don't have any plans for a BlackBerry compatible mobile application. And that's due to some technical difficulties because the BlackBerry system functions in almost a completely different environment than the other mobile systems that we've been creating. So unfortunately, we don't have one and we are working on updating our iPhone and Android applications before we try to move into BlackBerry. So we don't have any plans for that right now, but if that is something that would be of interest to a lot of people, please send me an e-mail because that's the kind of thing that the more we know about it, the more we can start trying to push for that and perhaps find a contractor that does make BlackBerry applications. (00:45:44)

Callie Campbell

Okay, another question from the webinar system, Barbara would like to know how do we get involved? (00:45:52)

Dr. David Scales

The best way to get involved is two things, one is depending on where you are working, if you're a crisis responder, one of the best ways to get involved is if there's a crisis, get in contact with us. If this is the kind of platform that you think could be useful, let us know. As I mentioned, the key to platforms like this is the information that comes from our partners. And so if we have partners that our working on the ground that can provide data that is useful to them and they think would be useful to others, this can be leveraged in online applications like this. Second, if you look at the slide that's up on your screen right now, if you look on the map, the lower left of the map it says is there an outbreak missing? Add it to the map. So the best way that you can often help us, is if there's something going on, if there's a toxic spill or an epidemic or something you know of, you can add it to the map just the same way as if you had "Outbreaks Near Me." And what that means is you can add a URL if you found a newspaper article that's talking about an epidemic or some other event, you can give us the URL. Or you can just report that the school closed near me because of some strange illness that the government won't talk about. You know, if you happen to live in a country where there is a lot less transparency, then this might be a situation that you might be encountering. In that case, one of the better ways than you can help us is to report this kind of information using that outbreak missing button in the lower left of the map. (00:47:28)

Callie Campbell

Okay, we have a few more questions on the system, but I want to know if there are any questions on the phone line right now? (00:47:36)

Teresa (Operator)

Yes, I have a question from Leah. You're line is open.

Leah

Hi, we were wondering if there were any privacy issues, especially with being able to drill down that say a physician puts in a case of TB, for instance, and we drill down to a census tract, and in that one town there is the one-person that's been coughing. So people might imply, or you know infer, that it is that one person that actually has the TB? (00:48:02)

Dr. David Scales

That's a great question. And that's why—for some of our systems, such as the BioMosaic system—you know, you can imagine if you're looking at a situation like this, and it starts drilling down into census tracts, there could be privacy issues. So one of the ways we are dealing with this is by trying to aggregate the data to larger levels either to census tracts or to counties. And census tracts is about 4,000 people, so it might be possible to be able to pinpoint someone at a census tract level, but we think it might be hard, because unless you know all 4,000 people and know who's coughing and who's not, then it is going to be a lot harder to identify them. That said, privacy is still an important issue even when you're looking at a

census tract level. And so, for our applications, especially sensitive ones, they are only released to the parties that use this information that are collaborators that we know can use it in a responsible way. That's number one. And number two, we've also developed online applications that are behind password firewalls so that no one can access it, except for those people who are expressly given permission. And so, if partners have concerns about how their data might be used or they are concerned that it might be looked at by an unfriendly government or something like that, to identify people who are sick and might put them in danger in any way, we can absolutely take steps to try to make sure that those concerns are alleviated. And there's many different ways that we can do that. We just encourage that if anyone has issues about—you know, recognizes these issues in advance. As long as we know about them in advance, we can develop structures to deal with them. I think the more difficult thing is just making sure that we think about the privacy issues as we're kind of bringing this data into these systems. It is always better to be safe than sorry in these kinds of -- when you're dealing with tuberculosis patients. (00:50:06)

Leah
Okay, thank you, one additional question, there is a tool out there right now that collects over-the-counter drug usage. Is there plans in the future to incorporate that data to corroborate what you are seeing in this system? (00:50:20)

Dr. David Scales
That's a good question. I'm not familiar with that particular data set. If that is information that the questioner would be willing to share with us, that is something we can look into. That sounds like a kind of data that we would be very interested in incorporating into the system. (00:50:37)

Callie Campbell
Okay, another one from the system that is a kind of a good segue from that one, how are you able to ascertain rumors and bad information from the good information? (00:50:49)

Dr. David Scales
So, we are not necessarily able to do that. What we do is we put it on the map and if there's later information that proves that the prior information was false, we remove the erroneous information. But because we are more of a conduit, we are not the validators, and a validation system would require many legs on the ground. That's where the partners come in. Because if the partners come back to us and say, actually that water point isn't really a water point, it is someone trying to sell water, or other situations like that, then we can remove that from our map. But in the short-term, it can appear on the map and that's something—um, why it is really important for our users to be able to have interactive ability with the information and click on specific events and see what's behind them so then they can make educated decisions regarding whether or not they want to act based on that information. (00:51:50)

Callie Campbell
Okay, do we have any other calls on the phone line right now?

Teresa (Operator)
No, we do not. (00:51:55)

Callie Campbell
Okay, we've got a few more on the webinar system. This one asks how the emergency preparedness professionals, state and local health departments, hospitals and others are being notified about the system availability and then also, is it going to be required or voluntary, and who is actually entering the data? (00:52:15)

Dr. David Scales
Okay, I can tackle that two-part question. I'm going to tackle the second part first. Who is entering the data? Right now, with some of the collaborations that we've had, it has been the partners themselves. And I recognize that this can be a concern for people, emergency professionals, working within different

layers of government. And because of that, we can take steps to protect the data so that it is only available to particular people that have passwords or particular IP addresses. These are steps that we can take for people that are working within government if they are entering the data themselves. But right now we have data that is with -- entered by our partners, and what that means is even if it was a Twitter report, for the Haiti Cholera collaboration, it was not put into the system unless one of our partners or us manually put it into that Google doc. We are currently working on ways that we can mine Twitter, and so the signal to noise ratio is something that we are continuing to work on because those…as we mine Twitter, that is an enormous problem that we are still struggling to deal with. So before we go live with essentially non-curated information, we have a lot of work to do.

But, an additional aspect of the questioner's question is how can emergency professionals be notified of these platforms, that's exactly the issue that we have been struggling with. When we produced the Haiti Cholera collaboration, it was our government partners that we realized were the ones that didn't hear about it. And so what we are trying to do is figure out ways that our government partners interact and just interact more with those networks so that we can be able to provide websites or other platforms like this sooner rather than later in the event of a crisis. And if the questioner has any suggestions for the best ways to be able to approach some of these professionals at local, state, county health departments, we would very much appreciate that. (00:54:41)

Callie Campbell
Okay. Are there any additional questions on the phone line right now? (00:54:46)

Teresa (Operator)
No questions on the phone line.

Callie Campbell
Okay, we have one about the social networking aspects. She would like to know how does the Twitter and Facebook feeds, do they have to be submitted or are they searchable? How do they work for those HealthMap systems? (00:55:03)

Dr. David Scales
So, they work much like our other feeds. In which case so, when someone submits via Facebook or Outbreaks Near Me, it goes into our system. So, nothing, it goes into a curated system and what that means is nothing will go on the map until a public health professional here at HealthMap looks at it and says whether or not it is going to be useful. We have had some strange updates. We've had someone reporting roadkill via the Outbreaks Near Me application and that was not something that made it on the map. We didn't think that would be of particular use to our users. The information comes in through the users and goes into a little bit of a purgatory until a public health professional looks at it and says yea or nay. After that, once it goes on the map it is marked as part of the HM Community. So, if you go to the advanced search, you'll be able to see under feeds, if you scroll down when you go to the HealthMap website, you'll be able to see there's HM Community. And HM Community reports, are these reports that are coming in through Facebook, Outbreaks Near Me, or the events that people might be submitting directly via the website. This is something that if a user is interested in looking at these crowd-sourced events, they can look directly at them or they can exclude them if they perceive them not to be of value. (00:56:33)

Callie Campbell
Okay, are there any questions on the phone?

Teresa (Operator)
No questions.

Callie Campbell

Okay. We have one more from Valerie. She'd like to know how much it would cost to use the system in a crisis? (00:56:49)

Dr. David Scales

So how much it would cost to use the system in a crisis? So right now, our overhead costs are paid for by some of the grants that we have here at HealthMap. So using the HealthMap system in a crisis does not cost any money. Creating collaborations such as the Haiti map that we created, that's something that depending what needs to be in it, that would determine the cost. If the data is coming from partners, then it is whatever cost that the partners have to be able to gather that data. Similarly, if we need external data, if there's data we need to purchase, that a collaborator would like, that would be a cost. But if there is no cost in gathering the data, no additional cost, that is, then if there's no cost on the partners side, there's no additional cost on the HealthMap side. So the Haiti website, which is at healthmap.org/Haiti, is free. It is available for anyone out there. And so, in general, the cost can be kept quite low. Particularly, because as I mentioned, the tools that we used in the toolbox are also all free. But it does depend a little bit on the cost of getting the data, so that something that needs to be kept in mind if partners are interested in bringing in data that has high cost that could potentially be prohibitive. (00:58:17)

Callie Campbell

Okay, and do we have any other callers now?

Teresa (Operator)

There are no questions. Nope.

Callie Campbell

Okay. That's all the questions we have in the webinar system right now. Ummm — Sorry, go ahead Susan. (00:58:36)

Susan Dugan

Hi Callie, this is Susan, I wanted you to go ahead and mention the poll about the webinar that you have available. (00:58:40)

Callie Campbell

Okay, this poll right here, if you guys found it useful, if not, let us know. You can also e-mail us if you have specific comments that you wanted to address. (00:58:56)

Susan Dugan

Great. Thank you all for taking the time to join us today. David, thank you so much, you're always a pleasure to work with and we look forward to future collaborations with you. Please do contact either David or myself, Susan Dugan, that's gkj6@cdc.gov, and we will be happy to answer any questions that you might have. Thanks again for your attendance and have a great afternoon. (00:59:23)

Teresa (Operator)

This concludes today's conference. You may disconnect at this time. Thank you. (00:59:28)

[Event concluded]