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People power emergency response

Humanitarian community sees untapped potential in social networks for early warning



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Relief organisations struggling to reach victims quickly and prevent disease outbreaks after a disaster are beginning to turn to online media networks for help, according to experts working in Haiti after the earthquake that devastated the country earlier this year.

From processing geographic data to simply sharing information about what's happening around them, people can make a real difference to emergency response in the aftermath of a disaster — whether they live in affected areas or in any other part of the world.

Writing in a review article¹ published online, a team led by Matthew Zook of the University of Kentucky in the USA describe how they produced maps of affected areas in Haiti using web-based technologies that aggregate spatial data created by volunteers working remotely.

"Given the urgency of relief operations, the ability to crowdsource the data collection process became particularly important," write Zook and colleagues in *World Medical and Health Policy*.

They say that 'crowdsourcing' — or inviting a large group of people to contribute to a project, in this case with data collection and processing — reflects a change from state-led to people-led use of information technologies in disaster response.

This "fundamental shift" in disaster response and the powerful implications of crowdsourcing were highlighted earlier this month in a white paper² published online by the American Red Cross. The emergency response community needs to adapt, it said, and learn to use this type of real-time input from the public. "Most of us are not yet ready to collect, respond or react to this incoming social data in a timely manner."

The American Red Cross cites Hurricane Katrina and the earthquakes in Haiti and China as examples of how social media are changing the way disasters are being reported. In the USA, a survey of over 1000 adults revealed that if the traditional 9-1-1 emergency phone system wasn't available, 20% of the population would use email, websites or social media to reach response staff. Nearly half would do the same if someone else needed help. "We, as a response and aid community, must get ahead of this trend to remain effective," writes the organisation.

Aid agencies have begun to tune in to the value of social networking technologies. But the humanitarian response in Haiti marked the first time that some of these were used extensively.

Helping in Haiti

Zook and colleagues say that because Haiti's infrastructure was poor even before the earthquake hit, maps needed to be made from scratch and updated regularly to reflect changes to the landscape in the first few days of the disaster — a task that under normal circumstances would take years.

"In response to this need, a rather unexpected solution appeared: volunteer community efforts matching simple web-based tools with nonprofessional data contributors," write the authors. "People and organizations around the world realized that they didn't have to be physically present in Haiti to provide meaningful assistance to those who were."

Word spread through online media. Within four days, volunteers based in Haiti and elsewhere began to use various web tools including **CrisisCommons**, **OpenStreetMap** (OSM), **Ushahidi**, and **GeoCommons** to put together aerial imagery with spatial information on roads and demographics. They also validated data on the location of medical facilities or other operational centres — helping relief workers find people in need, and creating a picture of conditions they were likely to face on the ground.

Social networking and mapping data are also feeding into disease monitoring. James Wilson, executive director of **Praecipio International** — the organisation that picked up the first reports of pandemic flu in 2009 — says the early-warning system set up in Haiti helped to raise awareness, "sensitising people to changing risk conditions".

Wilson told EHTF News that the Haiti Epidemic Advisory System helped professionals on the ground to understand gaps in logistics chains. With reports pointing to a potential outbreak, relief workers could actively check for supplies and

medications that might be needed down the line, he explains.

Crowdsourcing and mapping fed into disease monitoring efforts in Haiti and worked well, even though this wasn't the focus of the project, says Sean Gorman, one of the authors of the review, in an email. "We've talked to CDC [US Centers for Disease Control and Prevention] at a high level and have worked with Interaction and the World Bank."

Fine-tuning the system

"Each project has their own community of developers working to extend the product," says Gorman, who works with GeoCommons. "Currently the big initiative is developing an OSM deployment that runs completely off line. We've done the same with GeoCommons and have off line portable servers running in Haiti and Afghanistan."

Volunteers are once again creating maps in response to the floods in Pakistan. This is similar to what happened in Haiti from a technical point of view, Gorman points out. But there is less press and attention, and fewer people are involved. "There was more mapped in Pakistan prior to the disaster than Haiti, so there is more integration of existing data."

A disease-warning network similar to the one used in Haiti has also been set up in Pakistan, according to Wilson. But it is not quite as visible publicly. The organisation is working to earn the trust of local doctors.

This type of system works well in acute crises and situations that change quickly — where infectious diseases might show up abruptly and cause disruption, overwhelming a limited capacity to respond. Cholera and diarrhoeal diseases are good examples, says Wilson. There are high hopes that cholera will not become a huge problem in Pakistan, he notes, but monitoring continues.

The information coming in through social media is not always reliable, Wilson concedes, so it has to be cross-checked — with other networks, publicly available information, or doctors on the ground. Becoming desensitised is a danger, and "in our domain we cannot afford to be dull", he says. "You have to follow every lead."

The data created with crowdsourced mapping also come with drawbacks. Using several online tools means that volunteers often work on the same task, duplicating efforts and making the interpretation of maps more difficult. Having user-generated data also means that some areas will be left off the map. And ultimately, even though maps can improve logistics, they can do little to change the physical effort to get to people in need.

Nevertheless some of the mapping projects had a significant impact on relief efforts in Haiti. Others found few users, which Zook and colleagues put down to a lack of awareness. Wilson says that to get people engaged, organisations must first share information of interest to them.

References and link

1. Zook M, Graham M, Shelton T, Gorman S. Volunteered geographic information and crowdsourcing disaster relief: a case study of the Haitian earthquake. *World Medical and Health Policy* 2010, 2. doi: [10.2202/1948-4682.1069](https://doi.org/10.2202/1948-4682.1069)
2. The American Red Cross. White paper: the case for integrating crisis response with social media. 2010. [Paper](#)

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