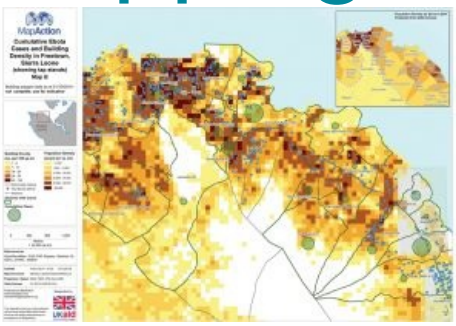
Mapping Ebola



In perhaps its most frightening deployment yet, MapAction has once again demonstrated how its volunteers with standard geographic information technology can make a difference. Working with the UN or other NGOs the volunteers have worked since last September in Liberia, Guinea, Sierra Leone, Mali and Ghana, reports Nigel Woof, to support the international response to Ebola.

The Ebola outbreak in a village called Meliandou in Southeast Guinea in December 2013 was not, of itself, a new phenomenon in Africa. The disease had first been described 37 years earlier, deep in what is now the Democratic Republic of Congo. Likewise, the employment of maps to fight killer diseases is hardly new: John Snow is venerated by epidemiologists and cartographers alike for his street mapping in the 1854 London cholera outbreak. Maps and more recently GIS have become routine tools in tackling epidemics.

Yet in the middle of 2014 the world was realising that the West African Ebola outbreak was ‘different’, and it had somehow not responded to the efforts that had controlled previous outbreaks. The international GIS community was deliberating how to bring into play its technology and methods against the spectre of what one British newspaper dubbed “The world’s deadliest plague”.

What made the West African outbreak different from previous ones was that, rather than being contained by tried and tested public health contingencies within a single rural village, the disease gained a hold in urban communities, and crossed borders into Liberia and then Sierra Leone.

UN Request

At the request of the UN, a team of experienced volunteers was sent to Liberia in September to support its Disaster and Assessment Coordination team on the ground. A further mission quickly followed to Sierra Leone where volunteers provided mapping expertise for the government’s National Ebola Response Center. Meanwhile, the UN’s Security Council responded to the enormity of the evolving crisis by setting up from scratch a new mission, the UN’s Mission for Ebola Emergency Response (UNMEER), to coordinate response to the emergency at a regional level. Here again, MapAction sent its team members to provide a ‘surge’ of GIS expertise to support this regional layer of response. Then, after a handful of Ebola cases were reported in Mali, a UN emergency response team with embedded MapAction support flew into Bamako in an effort to get ahead of the spread of the virus.

MapAction had never before responded to a disease crisis of similar proportions. But in fact, there was no shortage of available knowledge about the principles of using geospatial methods to help to contain the Ebola outbreak. Epidemiologists already at work in the affected countries, and international expert bodies like the London School of Hygiene and Tropical Medicine, explained clearly the priority needs: firstly to trace people who had been exposed to the virus, then to get communities on board with basic public health measures and to ensure dignified and safe burials. It was anticipated, and later demonstrated, that the disease would spread along road corridors. Ebola treatment units (ETUs) would need to be positioned in the right places, anticipating the transmission of the virus. The role of GIS would be, above all, to create a common operational picture for national and international agencies to ensure that the crucial care facilities were put in the areas of current and likely future need, as a tool for managing implementation of public health measures district by district, and to support the massive logistical challenge involved in the response.

Meeting the Practical Obstacles

Although the goals and information needs to support them were well understood, actually providing the necessary geospatial services and map products in Liberia and Sierra Leone was a huge challenge. Many of the practical obstacles were familiar to MapAction’s humanitarian mappers used to working in natural disasters or conflict zones around the world. These included limited national government capacities, international responders trying to work together in an unfamiliar context, as well as routine headaches like power cuts and unreliable Internet access. But another pervasive dimension of this crisis was fear: this affected willingness by communities to report Ebola cases and sometimes distorted information flows in other ways.

Fear also had an impact on the international capacity to mobilise a response. Unlike the medical staff on the front line, many of whom tackled the early cases in the Ebola outbreak without the benefit of proper protective gear, the MapAction teams at work in the region were not at high risk from the virus. But the charity still faced some of the same challenges as other international agencies in finding volunteers who had the backing of their friends, families and (crucially) employers to travel to the region and slot back into their everyday lives on their return.

The shortage of experienced humanitarian staff available to support the response within Liberia and Sierra Leone meant that the charity’s teams there could not rely on a stream of GISready data to map. In fact, on their arrival in Sierra Leone there was no comprehensive list of Ebola care facilities, so MapAction took on the task of creating one, which became a key information resource for the newly established National Ebola Response Centre (NERC). As in other humanitarian crises, the imperative was not to exploit the most sophisticated analytical capabilities of advanced GIS, but rather to capture, process and map basic figures on needs – here represented by daily figures on new Ebola cases – and of the response capacity, both operational and planned. And again as a commonplace of MapAction’s

experience in fifty humanitarian missions, even base map data was less than ideal; the lack of an adequate dataset of villages often prevented the geolocation of case reports, which rarely included coordinate tags (few public health staff working in the rural districts would have a GPS equipped smartphone, nor an awareness of the value of such geolocated data).

Standardising the Geodata

Working to support the newly mandated UNMEER, headquartered in Accra, Ghana, two MapAction team members strove to address the need for standardised geodata across the Ebola-affected region. They also advised on the establishment of a common data repository framework, which resulted in the linking of two platforms: the Humanitarian Data Exchange (HDX) and Ebola Geonode. Still, they also encountered many of the problems familiar from other emergencies, including the republishing of out of date datasets without metadata. On the other hand, several organisations around the world made extremely valuable contributions of relevant and high quality data, including the USbased Nethope organisation which obtained mobile phone coverage data for northern Sierra Leone, and the Humanitarian OpenStreetMap Team (HOT) which as usual responded rapidly to the need to fill gaps in map data for the affected region.

As the international response in West Africa gained capacity and traction, by Christmas the MapAction team had handed over most of its work in the region. A volunteer flew back to Mali to help with precautions in case of another outbreak there. Meanwhile, on a wintry January weekend, the other eleven staff and volunteers who had deployed to four countries in the 2014 response gathered at the charity's base in the Chilterns to review the missions and to capture lessons learnt. The tone was surprisingly upbeat and, despite the practical challenges, the positive contribution of GIS in supporting coordinated response to the crisis became clear. One volunteer who had spent a month working with the NGO Médecins Sans Frontières (MSF) in the field in Sierra Leone reported how important the map visualisation of both Ebola cases and the care facility plans of other agencies had been to MSF's ongoing response to the outbreak. Reports from other users of MapAction's information products, including senior decision makers, had spoken of the value of timely and relevant information geared to their needs to make sense of the dynamics of the crisis, and to allocate resources to get ahead of the virus.

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