

From Cholera to Ebola – mapping infectious diseases

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In 1854, there was a cholera outbreak in London. It was in Soho – less than a mile from the BMJ's office. Some people thought that the outbreak was caused by bad air, but a local doctor John Snow thought that it might be bad water. Snow drew a map of the area and dotted the map with local patients who had contracted cholera. It became clear that the outbreak was centred around a water pump in the middle of Soho. The council removed the handle from the pump and the outbreak faded away. It later became clear that the water in the pump had been infected with sewage.

This story has been told many times and John Snow has been credited with a discovery that was to lay the foundations of modern epidemiology. To make the discovery he needed clinical information and a good map. But how is this story relevant today?

In 2015, there was an Ebola outbreak in Sierra Leone. The health authorities took measures to assess the extent of the outbreak and to control it. They gathered as much information as possible about the patients affected – including where they were from. This was essential to map the outbreak and to assist in isolation and control. But there was a problem. The authorities didn't have reliable maps of all the rural areas that were affected. And this made the job of control even harder than it was already.

The Magburaka Ebola Management Centre operated by Médecins Sans Frontières in Sierra Leone decided to do something about this. (1) They recruited local people to travel to rural villages. They all had survey and navigation software on their phones. They collected data from 891 villages with an estimated 127,021 households. Within weeks, they created better maps for the local Ebola response teams. These in turn were used to “support surveillance, investigation of suspect EVD [Ebola Virus Disease] cases, hygiene-kit distribution and EVD survivor support.” They did this quickly and at very low cost.

Their research is an example of how to use simple technology and local know-how to overcome infectious disease epidemics. This was done with lay people and their mobile phones. With healthcare professionals and online knowledge on pandemic infections that is available on mobile phones, we may be able to achieve even more.

Competing interests

Kieran Walsh works for BMJ. BMJ produces BMJ Best Practice which contains a range of content on pandemic infectious diseases.

References

1. Nic Lochlainn LM, Gayton I, Theocharopoulos G, Edwards R, Danis K, Kremer R, Kleijer K, Tejan SM, Sankoh M, Jimissa A, Greig J, Caleo G. Improving mapping for Ebola response through mobilising a local community with self-owned smartphones: Tonkolili District, Sierra Leone, January 2015. PLoS One. 2018 Jan 3;13(1):e0189959.