

Ebola forecasting uses model developed by EU project

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Forecasters predicting the spread of Ebola are using one of the most sophisticated modeling systems in the world – the result of an EU research project.

An EU-designed forecasting model has shown that Ebola will have infected between 14,000 and 22,000 people (number of reported cases) in West Africa by the end of November 2014. The Global Epidemic and Mobility Model(GLEaM) is one of the most detailed and inclusive in the

world. It was developed by the EU's EPIWORK research project, which ended in 2013.

GLEaM produces realistic simulations of the global spread of infectious diseases by combining real-world data on populations and human mobility with elaborate stochastic models of disease transmission. GLEaM draws on flows of data never before included in health-related forecasting, such as daily airline passenger traffic, censuses, hospital admissions and medical services, funeral attendances, and even information submitted from mobile phones.

This product of EU research excellence is now available for laboratories around the world to help predict the spread of global diseases such as Ebola.

The use of GLEaM in EBOLA

Professor Vespignani, EPIWORK project leader at the time, is now head of the Laboratory for the Modeling of Biological Socio-Technical Systems (MOBS LAB) at Northeastern University in Boston, US. 'We began using the model for Ebola in July this year, when the disease started to show exponential growth in West Africa. We are also looking at the possibility of Ebola spreading worldwide. In the case of Ebola, so far the predictions of reported cases have been accurate within the probability range the model calculates,' he said.

The model was developed during the EPIWORK project, which involved collecting epidemiological data during the 2009 outbreak of H1N1 influenza, commonly known as 'swine flu', and making it available to the research community across the EU.

Daniela Paolotti , an epidemiologist at Italy's ISI (Institute for Scientific Interchange) Foundation, the institution which coordinated EPIWORK,

added: 'The focus for GLEaM in 2009 was the H1N1 influenza pandemic, but it was always meant to be extended to other [infectious diseases](#). The idea was to build a framework that could be used for new emerging diseases and as a result it has been able to be adapted to Ebola, too.'

These simulations help policymakers to visualize how the outbreak might spread, and therefore to prioritize public health measures to contain it.

Participatory science via website and app

During EPIWORK project, researchers also developed 'Influenzanet', a system to monitor the activity of influenza-like-illness (ILI). This system has a 'citizen science' focus, obtaining its data directly from the population completing an online application form, which contains various medical, geographic and behavioral questions.

Now Influenzanet has around 20,000 participating volunteers in local communities across 10 EU countries. It provides additional information for epidemiologists and public health scientists, who beforehand could only rely on the traditional system of primary care doctors forming sentinel networks to report the presence of disease. This creates a supplementary fast and flexible monitoring system, which does not replace the doctors' sentinel network, but allows for direct comparison of Influenza-Like Illness (ILI) between countries.

In many countries involved in Influenzanet, the web data is published weekly on government surveillance websites as an annex to the official data. During the project, the EPIWORK partners developed close contact with national health institutes which they can alert if the data being gathered through Influenzanet warrants urgent attention.

Influenzanet has also produced a reporting app for mobile devices, available through some of the national partners (e.g., www.influweb.it/app/), iTunes, Facebook and Twitter. 'In countries like Italy, where access to the Internet is mostly through smartphone, participation has increased a lot thanks to the mobile app,' observed Daniela Paolotti.

EPIWORK ran from 1 February 2009 to 31 July 2013 and involved 12 teams in eight countries. It received 4.85 million euros from the 7th Framework Programme.

Provided by CORDIS

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