

# HealthMap surveillance efforts illustrate global epidemiology of H1N1 spread

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As H1N1 began to emerge in April 2009, HealthMap - an automated online disease tracking and mapping tool created by researchers in the Informatics Program at Children's Hospital Boston - was already collecting information about the virus and plotting that information on a map of the globe, creating a freely available, real-time, digestible display of the outbreak. An article published in the May 6, 2010 issue of the *New England Journal of Medicine* (NEJM) reviews HealthMap's H1N1 surveillance efforts and details the ability of the internet technology to support traditional public health infrastructures, using an interactive map created in partnership with the NEJM to exemplify the tool's value in disseminating information and providing an ongoing picture of global health, as well as retrospective analysis of the pandemic.

"We can estimate that one million people used HealthMap to monitor H1N1 activity, enhancing situational awareness among [public health](#) professionals, clinicians, and the general public," said John Brownstein, PhD, assistant professor at Children's, co-founder of HealthMap and first author on the article.

The NEJM interactive used the HealthMap infrastructure to track suspected or confirmed cases or deaths, as well as cases ruled out or not identified as H1N1, based on formal ([World Health Organization](#), U.S. Centers for Disease Control, the Public Health Agency of Canada) and informal (news reports, blogs, user contributions, etc.) electronic media reports. In total, researchers analyzed more than 87,000 reports from informal and official sources from April 1 - December 31, 2009.

A retrospective review of the data collected suggests insight to the epidemiology of H1N1's intra-continental spread, for example, how quickly and where the virus spread in WHO regions and during various WHO pandemic phases. It also suggests factors that may have contributed to disease spread, including air travel and migration patterns.

Further analysis of the informal media reports allowed researchers to calculate the time elapsed between suspected and confirmed cases of H1N1 by country, whereby the authors identified a significant relationship between a country's national gross domestic product (GDP) and robustness of public health infrastructure.

"We looked at the time it took for a given country, once it had a suspected case of H1N1, to confirm infection and found an important relationship between country GDP and time to confirming a case," said Brownstein. "We found that countries with high GDP demonstrated a short lag in reporting and were confirming cases in a few days, whereby countries with low GDP could experience lags of up to 85 days."

The researchers note that several factors, including deficiencies in public health infrastructures and political pressures, may contribute to a lag in information flow and call for further research to clarify reporting structures and barriers.

"It is important to bring attention to disparities in international public health systems so we can work toward improving global health infrastructures - be that through surveillance, training, lab resources, etc. - and countries' abilities to deal with future pandemics," said Brownstein.

Provided by Children's Hospital Boston

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