A grid approach to pandemic disease control

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An evaluation of the Public Health Grid (PHGrid) technology during the 2009 H1N1 influenza pandemic could enhance the capabilities of epidemiologists and disease-control agencies when the next emergent disease appears, according to a study published in the *International Journal of Grid and Utility Computing*.

Terry Boyd and colleagues at the US Centers for Disease Control and Prevention, in Atlanta, Georgia, working with informatics specialists at Deloitte Consulting LLP, explain how historically, public health surveillance systems in the USA were designed to register information about specific public health issues among certain population groups and to answer particular questions about the spread of disease and the risks to those groups. Unfortunately, this approach to data collection and handling can limit the ability of public health professionals to use existing systems to investigate the emergence of novel threats from pathogens such as new influenza viruses.

During the 2009 H1N1 pandemic, however, the Public Health Informatics and Technology Program Office at the CDC together with various partners used simulated data to explore how a decentralized information architecture run on the Public Health Grid (PHGrid) might be used to acquire relevant data quickly, securely and to effectively model the spread of disease. The main advantage of building the system on the PHGrid is that it allows for disparate, distributed data and services to be used by the public health community and so avoids the obstacles seen with repurposing specialized surveillance systems.

"The speed with which public health officials can identify, respond, and deploy interventions in response to public health events has the potential to change the course or impact of a disease," the team explains. The PHGrid framework could be used to address specific surveillance needs such as those related to novel pandemic influenza in 2009. By using advances made by the "grid" community in health and other fields, PHGrid was able to focus on specific issues without having to re-invent and re-evaluate the information technology needed by using established data tools and formats. Such an approach also avoided the need to find ways to circumvent bugs and problems that would have arisen had new technology been developed at the time for the specific purpose.

The team points out that further research and development is needed to improve the use of grid computing. Nevertheless, it provides the ability to use standard services to share and analyze data that resides in multiple locations and avoids the security and data ownership issues that can arise in the medical and public health fields. The CDC team and its partners are now working on evaluating the same grid technology for other public health program areas.

  More information: "An example of the use of Public Health Grid (PHGrid) technology during the 2009 H1N1 influenza pandemic" in Int. J. Grid and Utility Computing, 2011, 2, 148-155

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