

# **Planning for the H1N1 flu**

## **how physics and computers help to fight off global pandemics**

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On 29 April 2009, the WHO Director-General, Dr Margaret Chan announced that “for the first time in history, we can track the evolution of a pandemic in real-time”. The crucial issue when planning for adequate public health interventions to mitigate the spread and impact of pandemics however is risk evaluation and forecast. This amounts to the anticipation of where, when and how strong the epidemic will strike.

In the last decade, advances in performance in computer technology, computing paradigms and data acquisition allow the generation of sophisticated simulations on supercomputer infrastructures to anticipate the spreading pattern of a pandemic. For the first time, we are in the position of generating real time forecast of epidemic spreading. In this lecture, I will review the history of the current pandemic facts, the major road-blocks the community has faced in its containment and mitigation, and what we can expect for the fall/winter seasons based on the predictive technology that physics and computer science provide us to battle epidemics.



Alessandro Vespignani is currently James H. Rudy Professor of Informatics and Computing and adjunct professor of Physics and Statistics at Indiana University where he is also the director of the Center for Complex Networks and Systems Research (CNetS) and associate director of the Pervasive Technology Institute. He has obtained his Ph.D. at the University of Rome “La Sapienza.” After holding research positions at Yale University and Leiden University, he has been a member of the condensed matter research group at the International Center for Theoretical Physics (UNESCO) in Trieste. Before joining Indiana University, Vespignani has been a faculty of the Laboratoire de Physique Theorique at the University of Paris-Sud working for the French National Council for Scientific Research (CNRS) of which he is still member at large. Vespignani is an elected fellow of the American Physical Society and is serving in the board/leadership of a variety of professional association and journals and the Institute for Scientific Interchange Foundation in Turin, Italy.