Research: How should countries best respond to a flu pandemic?

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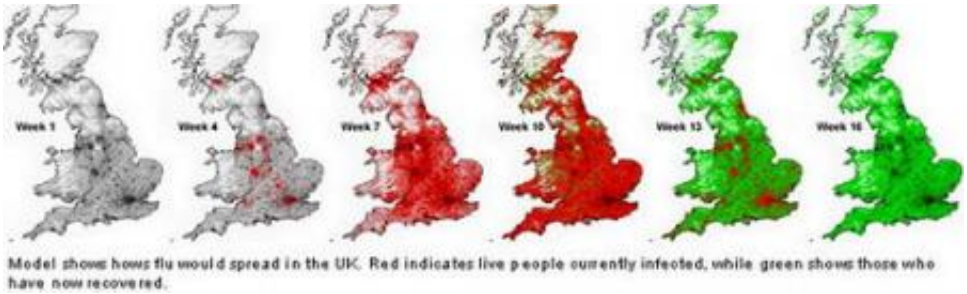

Model shows hows flu would spread in the UK. Red indicates live people currently infected, while green shows those who have now recovered.

The letter published today in *Nature* shows how the team from Imperial College London, John Hopkins Bloomberg School of Public Health, and RTI International used computer modelling to predict how a variety of interventions, including travel restrictions, school closures and antiviral treatment, would affect the spread of flu.

Professor Neil Ferguson from Imperial College London, who led the research, said: "The modelling shows there is no single magic bullet which can control a flu pandemic, but that a combination of interventions could be highly effective at reducing transmission, potentially saving many lives."

The research shows that border restrictions are unlikely to delay the

spread of influenza by more than a few weeks unless they are more than 99 percent effective. Restricting travel within a country is predicted to have an even more limited impact on slowing spread of a pandemic within that country.

The modelling predicts that a pandemic in the UK will peak within two to three months of the first case, and be over within four months. "Speed of response is therefore essential", says Professor Ferguson.

The modelling shows the number of people getting ill in a pandemic could be halved if school closure was combined with using antiviral drugs not just for treating cases (as is currently planned), but also to treat people in the same household as cases. The impact would be even greater if people in the same households as cases also voluntarily stayed at home. School closures on their own are predicted to have a minor impact on overall case numbers, but might slow the epidemic enough to reduce peak demand on health care resources by as much as 40 percent.

It also shows that vaccines need to be available within two months of the start of a pandemic to have a big effect in reducing infection rates. With current manufacturing methods, this means vaccines would need to be stockpiled in advance. This could significantly reduce the numbers infected even if the vaccine wasn not perfectly matched to the virus which emerges. A vaccine stockpile sufficient to vaccinate 20 percent of the population could reduce case numbers by a third if children were vaccinated within a few weeks of the start of a pandemic. Combining pre-vaccination with household prophylaxis could reduce case numbers by two thirds.

The supercomputer model simulated pandemic spread in Great Britain and the United States, using detailed data on population density and demographics, together with data on human travel patterns.

Source: Imperial College London