From: Tom Hartley
Sent: 02 March 2006 15:27
To: Edwards, Simon
Subject: Use of Mobile Phone data in Epidemiological Modelling

Dear Dr Edwards,

I am not sure if it is appropriate for me to submit evidence to the Pandemic Influenza working group, as I am not an expert in this area. I am a psychologist with some limited experience in modelling human navigation and spatial behaviour.

It occurred to me that mobile phone companies have access to data that would be very useful in modelling the human-human spread of a disease. As I understand it, a record is made when a mobile phone moves from one geographical cell to another part of the mobile network. This data for individual phones is sometimes used to locate individuals in the context of criminal investigations, but it could also provide a very rich and fine-grained source of information on the mass movements of population. In particular it should be possible to make a detailed map of the probability that a person known to be at a given location at a given time will be at any other location after a given period of time. This would clearly be very useful in modelling an epidemic, and in planning effective countermeasures.

This would be based on judicious sampling (e.g., 24 hours) of the data held by the networks rather than constant monitoring. For the most accurate models one would want take into account individual movements (because some flows must be largely tidal - where the same individuals are going back and forth, whereas others would presumably be dominated by different individuals). In this case to avoid any breach of privacy the data would have to be completely anonymized and access strictly controlled to prevent it being abused for some unanticipated purpose. However, for many purposes there would be no need for data to include individual movements, and so no need to compromise the privacy of individual phone users at all.

I appreciate that this is probably a rather naive idea from the point of view of epidemiology. It is also possible that it is obvious and has already been done, or else rejected on the grounds of cost, for technical or other reasons. However I thought it worth raising the suggestion in case it is a good idea that has not been explored yet. In the context of an epidemic that might affect a very large proportion of the population, I thought it might be worth the risk of looking a bit foolish!

Best wishes,

Tom Hartley

==========
Dr Tom Hartley
Dept. of Psychology,
University of York
Heslington,
YO10 5DD
UK.