

Epidemics: combatting the threat

Research into the swine flu virus has much to teach us about how society should react to the spread of illness

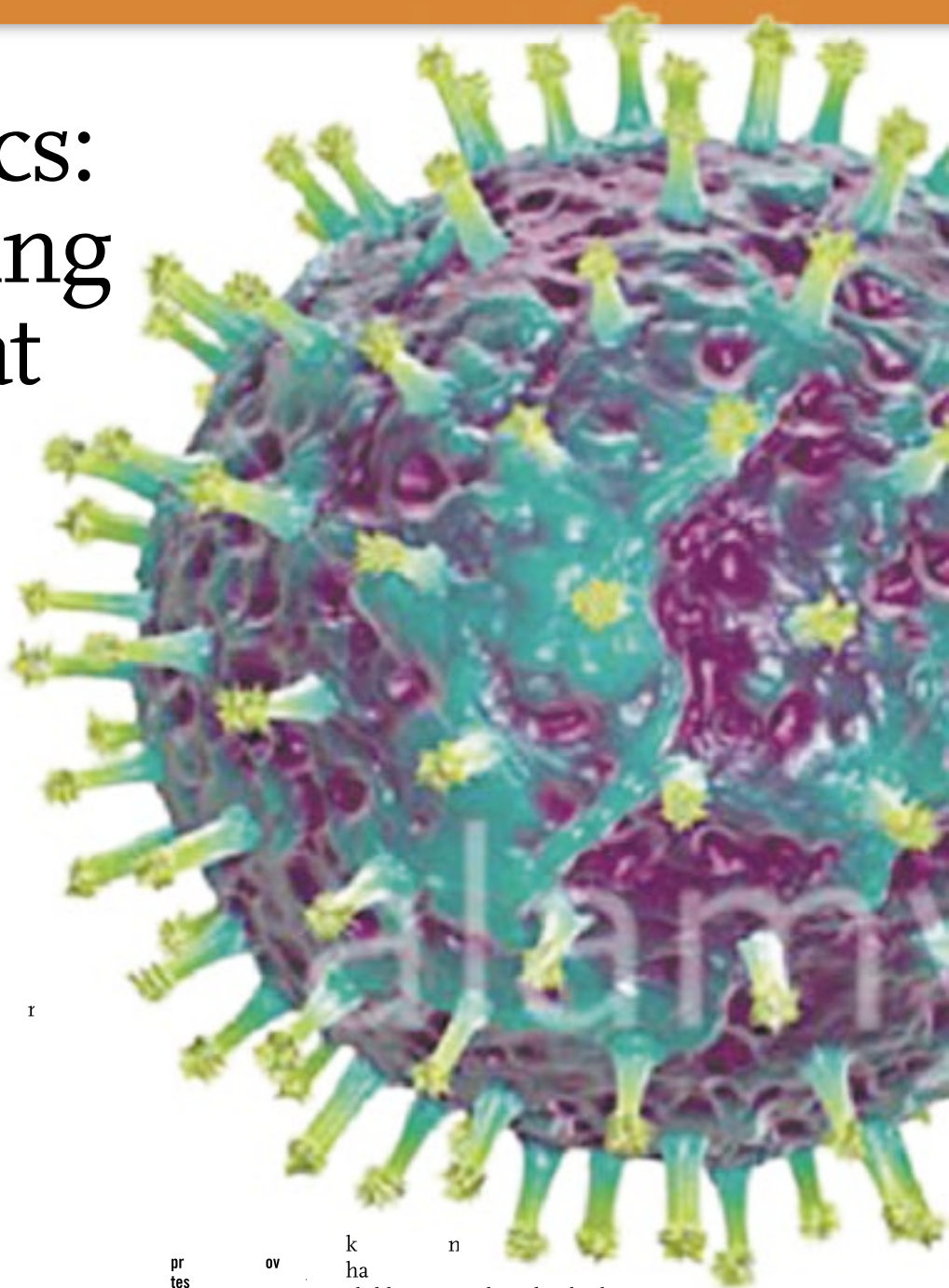
Martin Ince, science journalist

THERE ARE epidemiologists who have been waiting for their lives for something like this." Dr Jonathar a veterinary pathologist at the University of Liverpool, does not wish to sound hard-hearted. He goes on to explain the H1N1 virus – swine flu – is with fascination rather than fear of his colleagues. It is because highly infectious but not particularly dangerous. Most people who get over it. This makes it a perfect for our response to future, major outbreaks, including a possible one which may emerge from H1N1.

Dr Read is one of a number who have been supported by the about society's response to H1N1 epidemics. He works on the big diseases as well as on society's them, and is working with a multi-group which includes social scientists, psychologists and co- as well as epidemiologists.

He says that his group is not quantitative data to include in models of the severe disruption that H1N1 might cause to society, including the economic damage it might entail.

For a concrete example, think what happens if schools are closed to discourage the spread of flu. Dr Read explains: "The real problem is that nobody



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children once the schools close.

The first thing the parents might do is to set up crèches so the children all congregate anyway.

Even that is not a simple effect. In a school, most infection is transmitted in class, between children of similar ages. In a crèche or at home, you get a new pattern in which infection spreads ➤

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► between children of different ages.” And as well as the medical issues, there are the business and economic effects. “How will employers react if everyone who has children suddenly needs four weeks off?” asks Dr Read.

Dr Read’s economic and epidemiological models should allow the effects of actions like school closures to be foreseen more clearly. As he says: “H1N1 is mild compared to the 1918/19 flu epidemic, to SARS, or to H5N1 bird flu, which has a 50 to 60 per cent mortality rate. We are finding out more about how people would react to that sort of threat – essentially by heading for the hills.”

His project is based partly in psychological studies of what people say they would do in an epidemic and how they might react to advice in the media or from the government. Another part of the research is more technological. It uses Bluetooth phone technology, which allows mobiles to sense each other’s presence, to gather data on how often people are near to others and how they mix. At the moment, says Dr Read, there is too little data on social distance, despite its importance for models of infection.

The end result, says Dr Read, will be economic models of future infection that take account of actual human behaviour. In turn, this research should feed ideas on how messages to the public about epidemic disease are best phrased.

This project has scope for wider application. For example, in Africa, most people have a mobile phone but landlines are rare, so the phone contact method could fill a big gap in our knowledge of the working of African societies. And in the UK, says Dr Read,

the same research could be used to “inform policy on the hoof” as and when an epidemic breaks out.

‘Protect and Survive’ in the era of swine flu

Meanwhile, John Preston is looking at H1N1 through the prism of the Cold War. Now Professor of Education at the University of East London, he began this work while at the Institute of Education in London. Professor Preston explains: “My interest is in what I term preparedness pedagogies – the ways in which people are taught how to react to emergencies.”

He is doing this work by interviewing policymakers and scientists, digging through archives and interviewing focus groups. His main focus is on nuclear war and terrorism, but as he says: “This work has a lot to say about pandemics.” He believes that preparedness has major implications for social equality. There is a steep gradient in social class that dictates who is prepared for an emergency and how likely they are to survive.

Professor Preston has been struck by how often UK government literature shows white children as the possible victims of H1N1, itself a mysterious foreign disease. This was also true of the nuclear weapons precautions literature of the Cold War, such as the *Protect and Survive* brochure of 1980. The same applies to TV advertising about bird flu. Here, says Professor Preston, “You see a white man sneeze, and then black folk pass it on to some white children, and the idea is that it is their survival that is important.”

Professor Preston says things do not have to be that way. While there is rarely a black or Asian face

Preparedness leaflets make unrealistic assumptions about our available resources

In the swine flu leaflet, you are advised to stay put for up to two weeks. You need a lot of resources to do that



in a British emergency preparedness leaflet, the US Department of Homeland Security shows a much broader range of people in comparable literature. US bodies such as the Federal Emergency Management Agency are also using more social media to get emergency information across. This reaches a wide and diverse audience far faster than print brochures or even broadcasting. But US practice during emergencies is not necessarily anything to envy when it comes to ethnic equity, as the largely black death toll from the Katrina flooding of New Orleans in 2005 shows.

Another problem with preparedness publications is in the assumptions they make about the resources which people have available. Professor Preston says: “The main H1N1 leaflet is in some ways a throwback to *Protect and Survive*, which advised people to stay where they were. In the H1N1 leaflet, you are advised to stay put for up to two weeks. You need a lot of resources to do that, and these publications presuppose that you have them.”

Professor Preston says that class bias tends to be visible in documents such as the London evacuation plan, which regards it as a potential problem that



the very multi-racial population of the inner city might move out in an emergency. But he adds that things are getting better in some ways. For example, the H1N1 literature is available in a greater range of languages than previous efforts.

Professor Preston adds that policymakers are often stunned at his findings, especially by the vastly different survival rates that the same advice will produce for different social groups. "This work is often carried out by people with high security clearances, who may not be terribly consultative," he says.

How well do facts travel?

Dr Erika Mansnerus at the ESRC Centre for Analysis, Risk and Regulation is looking at the same problem from a different angle, by examining the way in which plans are made to cope with disease and how the information they produce is exploited. She says: "Models of how diseases spread look impressive and are widely used. But what are their limits and what are the behavioural factors that underlie them?"

She points to H1N1 as an example. In its early days, nobody knew for sure that it came from Mexico or was derived from pigs, let alone how infectious it was. These facts are needed to inform modelling, and therefore policy.

Now we know all these things and we also know the pathogen's complete genome. This means, says Dr Mansnerus, that the known unknowns faced by bodies like the European Centre for Disease Prevention and Control, which model the spread of disease, are less severe. Models also get better as they receive more current data. She says: "At the

There are fears that the free issue of Tamiflu could allow the H1N1 virus to become resistant

beginning, in March 2009, the models for H1N1 were using data from previous epidemics in 1918 and 1957. Now we have actual data from the current outbreak."

The lesson, she thinks, is to look with a cautious eye at the apparently smooth graphs of future disease impact. "There are big grey areas in our knowledge of the near future. It is important to keep this process transparent and to communicate the unknowns."

Dr Mansnerus is interested in how these data travels and gets used. Modelling based on the Mexican experience suggests that quarantines and school closures are an ineffective and disruptive way of slowing an epidemic. This information has now become part of the World Health Organisation's advice, and is informing planning in the UK. But the WHO has also issued advice that the free issue of drugs such as Tamiflu may allow the disease to become resistant. Despite this, the UK is issuing Tamiflu without tests of the patients receiving it.

By contrast, there has not been a comparable programme of flu vaccinations. Public memory of the MMR vaccine controversy may have lowered the British public's enthusiasm for vaccination in general – as could even older memories of bad side effects from whooping cough vaccines in the 1970s. We may think we are reacting sensibly to possible epidemics, but Dr Mansnerus warns that underlying attitudes are slow to change, even in a world of rapidly altering threats. ■

http://www.ioe.ac.uk/staff/LCEN/LCEN_32.html

<http://www.lse.ac.uk/collections/CARR>

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