

A/H1N1 INFLUENZA UPDATE

As the English government launches a dedicated telephone service and website that will prescribe antivirals to take the pressure off GPs, **Adrian O'Dowd** reports on the latest information on swine flu

What more do we know about A/H1N1 compared with two months ago?

Much more is now known about the virus's transmission characteristics, what happens in the clinical setting, and its mortality and morbidity. The UK Health Protection Agency (HPA) has undertaken a project that has collected detailed data on 350 cases of influenza and the patients' close contacts. Results have not yet been published, but the data have been used by the agency's modellers for forward planning and potential impact. The HPA says that this virus is similar to seasonal flu. Taking oseltamivir (Tamiflu) is not a pleasant experience, with side effects that include nausea, diarrhoea, and hallucinations.

According to the World Health Organization the 2009 influenza pandemic has spread internationally with unprecedented speed. In past pandemics, flu viruses have needed more than six months to spread as widely as the new H1N1 virus, which has spread in less than six weeks. However, international travel is far more common than it was in the times of the previous pandemics in 1918, 1957, and 1968, and techniques to measure it now are much more sophisticated (*N Engl J Med* 2009;361:279-85).

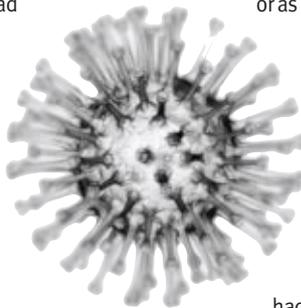
Researchers from Imperial College London in a study published in the *BMJ* have called for better estimates of case fatality ratio because the methods currently being used could overestimate or underestimate the numbers (*BMJ* 2009;339:b2840). The study shows that the virus is not becoming more virulent.

Has advice to healthcare professionals from the HPA changed since WHO announced pandemic alert 6?

The fact that the virus was spreading enough for WHO to move to a phase 6 alert in June did not change the HPA's advice. The change of alert refers only to geographical spread of the disease and not its severity. Joint guidance issued in January by the Royal College of General Practitioners (RCGP) and the BMA with the support of the Department of Health recommended that general practices set up

"flu centres"—cordoned-off areas in practices for people with suspected flu to try to halt the spread of the virus (www.bma.org.uk/health_promotion_ethics/influenza/panflugp/panfluguiddec08.jsp). This has not happened widely owing to a lack of physical space in many practices or the difficulty in arranging special separate appointment times for patients with flu symptoms.

A second edition of the guidance is being written and is due to be issued in a month. It will feature new chapters, including one on out of hours services. What has changed is the move from a phase of containment of the virus, which is no longer possible, to one of treatment. Swabbing in primary care is no longer necessary unless there are special reasons to do so, such as infection control or as part of surveillance schemes.



What are the latest predictions on how serious this virus is?

There have been 29 deaths in the United Kingdom as of 19 July among people confirmed to have the virus, although it was not always the cause of death.

The HPA has estimated that the UK had 55 000 new cases last week (range 30 000 to 85 000) in addition to the existing 9718 already confirmed previously. Figures from the RCGP show that 50.3 people per 100 000 reported flu-like illness between 29 June and 5 July, but this rose sharply by 46% to 73.4 people per 100 000 between 6 and 12 July. Globally, there have been 139 566 cases and 781 deaths, according to the European Centre for Disease Prevention and Control.

The Department of Health has issued estimates that about 12% of the healthcare workforce and 8% of the total population are likely to have the virus at any one time. England's chief medical officer, Liam Donaldson, said that the NHS should prepare for 0.1-0.35% of infected people dying, giving a range for deaths from the first wave of 3100, if only 5% of the population fall ill, to 65 000, if 30% fall ill.

The BMA has criticised the government for raising people's fears unnecessarily and has emphasised that, for most people, flu A/H1N1 is not serious and can be managed with self care at home. Perspective is important: seasonal flu usually kills 8000-9000

people a year, although in 1999-2000 there were 19 000 deaths related to flu.

The national director for NHS flu resilience, Ian Dalton, says that NHS organisations should use the department's new planning assumptions to develop their existing plans (www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_102892). Practices should be ready to meet extra demand and consider the impact of staff absence.

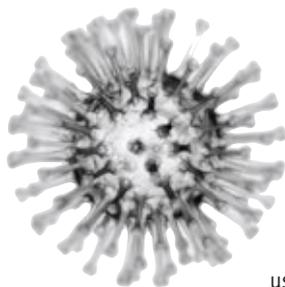
How are current arrangements for administering oseltamivir working, and what are the new arrangements?

The success of arrangements for administering antivirals varies around the UK. The current arrangements for distributing these are decided by each primary care organisation, with some areas using community pharmacies and others using other collection points or out of hours services. Generally, general practitioners (GPs) can diagnose patients by telephone using an algorithm published by the HPA or RCGP. If the doctor is satisfied that the patient is describing the symptoms of the virus, he or she issues a handwritten antiviral request form or voucher for a friend of the patient to collect before going to an antiviral collection point. The BMA has concerns that people are getting antivirals too easily and are being needlessly medicated and that arrangements for prescribing and administering oseltamivir are too complex. The BMA thinks that it does not make sense to ask doctors to revert from using a standard prescription form (FP10).

Will National Pandemic Flu Service help GPs?

It should do if handled correctly. Despite delays, the National Pandemic Flu Service, a national telephone and internet service for England, should have been launched by the end of this week. It will focus on self care, and the health secretary, Andy Burnham, said in the House of Commons this week that it will be able to prescribe antivirals by telephone and by the internet. Liam Donaldson first announced the service last week as one way to take pressure off services and to help GPs in hot spots, who are being "completely overwhelmed."

Scotland's health telephone and internet service, NHS24, in partnership with Health Protection Scotland, set up the Scottish Flu



Response Centre at the start of June. This service, staffed by about 60 people, has been well used and gives the public specific advice, information on self care, and reassurance.

The BMA's General Practitioners Committee says that anecdotal evidence shows that GPs have been less overwhelmed as a result. People in England will be able to bypass their GP by using the National Pandemic Flu Service. If they have symptoms, answer a set of questions designed to identify the virus, and are in one of the high risk groups they will receive an authorisation code for a friend to take to a collection point to get an antiviral. The algorithm has been designed in consultation with the RCGP and the BMA. The thinking behind the service is to allow GPs to deploy their time more usefully in other areas of care.

About 2000 staff in call centres will be available, who will probably not be clinically qualified. The RCGP is happy with this, but the BMA's Peter Holden said that the threshold for getting oseltamivir is low. If the service fails to meet demand, there are concerns that people will soon stop using it and revert to calling their GP or NHS Direct. Andy Burnham, speaking in the House of Commons on 20 July, said that the service would go live on Thursday 23 July, subject to testing. "The technology to launch the National Pandemic Flu Service has been available for some time, but with these latest HPA figures and drawing on advice from the field we have now reached a point where the service is required," he said. "It will be accompanied by a major public information campaign."

The service will not be available in Scotland, Wales, and Northern Ireland because the demand is not as high, but these countries can opt in later if they wish. In Scotland patients with flu-like symptoms have been able to call NHS24 on 08454 242 424, its specialised Scottish Flu Response Centre, or their GP, or they can get more information at NHS24's website (www.nhs24.com/content/default.asp?page=s3_12). In Wales people are being advised to stay at home and either call NHS Direct on 0845 4647 (www.nhsdirect.wales.nhs.uk); their GP; or the swine flu information line, on 0800 1 513 513. Northern Ireland has its own helpline, 0800 0514 142 (www.nidirect.gov.uk/index/health-and-well-being/swine-flu.htm).

Is it worth wearing a facemask?

A systematic review in the *BMJ* last year showed that many simple and cheap interventions in healthcare settings, including facemasks, can help to reduce the spread of respiratory viruses, but their usefulness is limited (*BMJ* 2008;336:77-80). Ordinary surgical masks become sodden in 90 minutes, so doctors would need to change masks

six times a day if they wanted to wear a mask continuously. Facemasks should be used when doctors are performing high risk tasks, and supplies are limited so it is best to use them only when around affected patients.

Because the virus is now a pandemic, widespread use of facemasks by the public is highly unlikely to stop the disease spreading. Masks might give people false reassurance and lead them to ignore basic hygiene measures, such as handwashing and not reusing and disposing properly of tissues, which are far more effective at preventing spread.

How soon will a vaccine be available?

The government has signed contracts for enough vaccine for the whole UK population. Despite some reports that it may be arriving later than expected, the latest advice from the BMA, the RCGP, and the Department of Health is that it will arrive in late August or early September, albeit in small quantities initially. It will be distributed quickly to practices so that doctors can start work on priority groups, which will include the same as those vulnerable to seasonal flu, healthcare professionals, chronically ill people, and children under 5. It is anticipated that there will be 60 million doses available by the end of the year, enough to vaccinate 30 million people because each person needs two doses, with more following.

What are the likely arrangements for distribution of the vaccine?

Precise arrangements for the distribution of the vaccine are not agreed, but it will be delivered to general practices as soon as possible. GPs will lead on a national immunisation programme on the scale of the huge 1962 vaccination programme in the UK against smallpox. The BMA has compiled a database of 343 retired doctors who say that they are willing to help if needed. The General Medical Council has agreed changes to its rules so that they could quickly be granted temporary registration.

Discussions are ongoing about who should get the first vaccines when they arrive. It is highly likely that frontline clinical staff and those involved in frontline support (such as laboratory staff and porters) will be among the first to receive the vaccine as well as the priority groups, similar to those vulnerable to seasonal flu. After these, trying to select particular occupational groups is difficult. WHO's advisory group of experts on immunisation has advised WHO to recommend that all countries should immunise their healthcare workers as a first priority.

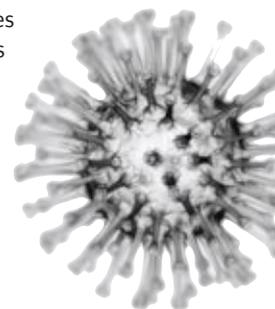
Should pregnant healthcare workers deal with patients with swine flu?

Pregnant women have been shown to be at risk from the virus. Growing evidence shows that many

practices with pregnant GPs are starting to think differently about whom these doctors should be seeing. It is up to the discretion of local practices, but the BMA has said that doctors and nurses should not put themselves into needless danger and take appropriate precautions. Pregnant healthcare staff should avoid dealing with patients with flu if possible, but this cannot be a total ban. The RCGP has advised that where it is practical and does not have an adverse impact on patients, pregnant healthcare workers should be directed away from dealing with flu patients.

Has A/H1N1 mutated? If not, how will we know if it does?

The virus has not mutated since appearing in Mexico in April. The reference laboratory at the HPA's centre for infections carries out sequencing on samples of viruses that are sent in on a regular basis to keep track of any mutations. Similar work is happening in other countries. WHO's four reference centres around the world (in the UK, the United States, Australia, and Japan) are carrying out similar monitoring on a global scale.



Is swine flu more likely to infect the lungs than other flu viruses?

All influenza viruses primarily attack the lungs. In a study by the University of Wisconsin-Madison published in *Nature* this month, researchers found that the virus yields an infection in the lungs that is more severe than would be expected from an average seasonal flu (2009 Jul 13, doi:10.1038/nature08260).

Where can I get up to date information?

See the *BMJ*'s microsite, at <http://pandemicflu.bmj.com>. The Department of Health has weekly online updates each Thursday (www.dh.gov.uk). The HPA is also posting a weekly update on Thursdays (www.hpa.org.uk). The RCGP has regular online updates (www.rcgp.org.uk).

Adrian O'Dowd is a freelance journalist, Margate adrianodowd@hotmail.com

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See EDITORIAL, p 181, NEWS, p 189, OBSERVATIONS, p 200, RESEARCH METHODS AND REPORTING, p 220,

PERSONAL VIEW, p 241

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HANS ROSLING

Animated about statistics

Hans Rosling's efforts to make health statistics understandable have also found a way to make them fun.

Geoff Watts talks to him about his work

On my computer screen I'm about to view a short presentation downloaded from YouTube.¹ It's about the history of life expectancy in relation to income. I click on play, and the title gives way to the face of a middle aged man with short brown hair and glasses, clearly being recorded by a camera mounted on his desktop computer. This image occupies the top left hand corner of my screen; the rest is taken up with a striking graphic featuring variously coloured blobs and dots of different sizes. The man begins to speak. The accent is Nordic. "It was the last 200 years that changed the world. I will show you . . ." His eyes flick from the camera down to his computer screen as he moves its cursor (and mine). In less than five minutes he vividly illustrates two centuries of global change.

The man is Hans Rosling, professor of international health at Sweden's Karolinska Institute, and he's doing what he does best: using an animated computer graphics system of his own devising to put life into what might otherwise be treated as dull statistics. Or, to use his own slogan, "Unveiling the beauty of statistics for a fact based world view."

The distinctive features of Rosling's presentations—the animation, the blobs of colour (bubble graphs), and the rest—did not arrive overnight. Years ago, when he began thinking how to make data more appealing, he relied on overhead transparencies with one sheet laid on another. Hardly sophisticated. Computerisation was clearly the remedy, but what did he know about it? "Zero," he says, in a tone more triumphant than apologetic.

After the 1992 UN Rio conference on environment and development (the Earth Summit), students at Uppsala University requested a course about humans and nature: one stop shopping for all the global issues. "When lecturing on the course," Rosling recalls, "it came to me that the world view of the students was 'us' and 'them,' the Western world and developing world. But this is no longer the case. Child mortality varies continuously from 3/1000 in Sweden to 300/1000 in Afghanistan. Where is the cut off between the Western and the developing worlds? But they wouldn't seem to accept this view. It forced me to begin improving my graphics."

This was when he came up with the idea of bubble graphs. Each country was represented by a bubble, the size and colour of which denoted its population and its continent.



Gross domestic product was displayed on the x axis and child survival on the y axis. (He uses survival not mortality because he has found falls in mortality are not understood as well as rises in survival.) “I call my method ‘evidence based brutal simplification.’ To change deeply held views you have to make things simple. And with humour as well you can open people’s minds.”

Apropos of nothing in particular he breaks off to tell me that he’s a sword swallower and a fire eater. These activities are, it seems, the remnants of a thwarted ambition to act: thwarted, probably, by an inability to be anyone but himself. The point he’s making, obliquely, is that there’s more than a touch of the showman in his make up.

Moving pictures

Back to the presentations. His original bubble graphs, composed using existing software, were time consuming to make and only a rough and ready approximation of what he wanted. A computer games enthusiast was able to take him one stage further. But his ambitions still outstripped what he could actually do. The bubbles had to move, to change in size; he needed to introduce animation. Rosling’s laments, uttered regularly over family dinners, got his son Ola involved in the project. In 1998 Ola spent 10 weeks devising a new computer program. It was the prototype of what eventually became Trendalyzer, the software that provides animation and still underpins most of what Rosling does.

Time, in Rosling’s graphics, is often represented as movement. “If the bubble moves to the right it means getting richer like the oil countries. If it moves up but not to the right it means getting healthier but not richer, like Cuba and China. Going both to the right and upward means a balanced economic and social development.” Speaking to me about the relative economic performances of China and Japan over time, Rosling slips into the racing commentator style of rising vocal excitement he uses during lectures to describe the movement of his competing bubbles across the screen. His lectures—some are available on the web (www.gapminder.org/videos)—are indeed performances.

Audiences that have hitherto found themselves bored by the presentation of data find something to interest and entertain them. But better still, so Rosling claims, they seem to acquire a better understanding of the topic. “In 1960 there was a group of countries with large families and short lives and another group with small families and

longer lives. Two clear groups. Now it has changed.” Such is the pace of this change, people’s perception of the world often lags behind the reality. With Rosling’s graphics they can see the course of the change in 60 seconds. “Child mortality in Egypt, in one generation, has fallen from 20% to 4%. In the past 16 years, Bangladesh and Egypt have improved child mortality faster than Britain and Sweden ever did.” Why seeing animated graphics should make a difference in absorbing propositions like this is hard to say. But it does.

In 2005, in collaboration with his son and daughter in law, Rosling created the Gapminder Foundation to finance the work. More recently the foundation has formed a relationship with Google, which has resources for developing software that Gapminder could never have matched. “Google acquired the software and paid the foundation for it. That means the foundation now has capital on which we can continue to develop, while still having access to Trendalyzer software and future versions of it.” Rosling, to his relief, is free to concentrate on the data, not on software development.

At first he recorded his illustrated mini-lectures in a TV studio. Now he does them in his own office on his desktop computer. They may not have the same technical polish, but Rosling cheerfully suggests that because he’s an academic not a professional TV presenter, his audience is predisposed to be more forgiving. The topics on which he concentrates are global health, population, the environment, and their economic underpinnings. Among his current ventures is a plan to illustrate risk. He wants to devise an interactive method of exploring personal health risks of the kind that combine behaviour and inheritance. A challenge indeed.

Health differences

Rosling’s current thinking has come a long way from its genesis. As a student his original interest had been in economics and politics, for which reason he’d spent a brief period studying statistics. In the end it was medicine that prevailed. Before he’d finished his training at Uppsala University he’d decide that his true interest lay in public health. “Four years into my medical studies I took a course in public health at St John’s Medical College in Bangalore. That was an eye opener.”

Even more so were the two years he later spent working in northern Mozambique. Towards the end of his stint in the country he was confronted with a local outbreak of spastic paralysis. It turned out to be konzo, a previously undescribed nutritional disease. It was scrutinising medical data that offered the clues to its aetiology. But perhaps of more importance for his later career was the wider thinking prompted by his experiences in Mozambique.

He remembers realising that he was the only doctor for 360 000 inhabitants. “In Sweden, for the same number of people, there would be 800 doctors. I was alone. So, each morning, which of the tasks of these 800 doctors was I to choose?” He began to make comparisons between his district in Mozambique, which bordered the Indian Ocean, and the Swedish county on the Baltic coast where he’d done his internship. “In 1800 we had the first medical doctor in that region of Sweden. So there was a 200 year difference. When I came to make my annual report I started to compare Mozambican child mortality with Sweden. To explain what I had been doing in immunisation and so on I made a map of the two districts overlaying each other. I showed the number of people, the number of child deaths, and the number of doctors. There were two zeros difference in the number of deaths: 30 in Sweden, 3000 in Mozambique.”

He returned to Sweden, initially to Uppsala, to pursue molecular epidemiological research, doing field surveys across Africa. But the “difference of zeros” stayed with him and became the preoccupation that led eventually to what he does now at the Karolinska.

When it comes to his own view of the future, Rosling claims to be neither an optimist nor a pessimist but what he likes to call a possibilist. “You can see a lot of things are possible. Whether they will happen that way you don’t know. We humans are emotional and ideological. The aim of the Gapminder Foundation is to promote a fact based world. To build the discussion of our common future on facts.”

Geoff Watts freelance journalist, London
geoff@scileg.freereserve.co.uk

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1 Gapminder Foundation. *200 years that changed the world*. www.gapminder.org/videos/200-years-that-changed-the-world.

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