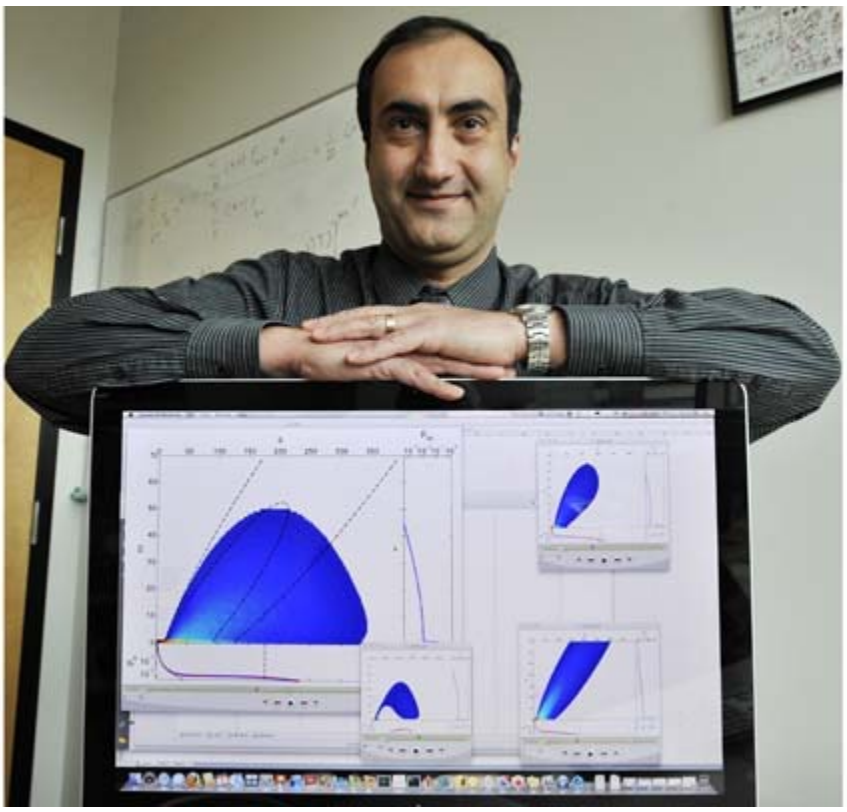
H1N1: The worst is yet to come

Pandemic viruses adapt to us quicker than we can adapt to them and predicting their behaviour is a tricky business

BY RANDY SHORE, VANCOUVER SUN NOVEMBER 7, 2009 5:38 PM



Babak Pourbohloul, director of the division of mathematical modelling at the B.C. Centre for Disease Control. He says new cases of the H1N1 flu pandemic gripping B.C. will likely continue to rise until the last week of November or the first week of December.

Photograph by: Ian Smith, Vancouver Sun

New cases of the H1N1 flu pandemic gripping B.C. will likely continue to rise until the last week of November or the first week of December, according to a scientist at the B.C. Centre for Disease Control.

Despite a startling rise in the number of hospitalizations over the week ending Nov. 2, the outbreak will continue to worsen for several more weeks at least, said Babak Pourbohloul, director of the division of mathematical modelling at the BCCDC.

“The parameter values added to the model over the past few weeks suggest that it would be more probable to have a peak at the end of November or early December,” he said.

Pourbohloul said the “vast majority of the simulations” the centre has done give a range of three to five weeks from now as the likely zenith for infections.

But B.C. medical health officer Perry Kendall said that doesn't necessarily mean things will start to get better immediately after the peak is reached.

Kendall warned this week that a flat peak could extend the pain for several more weeks before infection rates begin to drop.

"It really depends on how fast you can immunize the population," said Pourbohloul. "The exact shape of the peak may not be attainable; we'll have to wait and see what it looks like."

The problem is that pandemic viruses learn how to infect humans much faster than we can learn how to stop them. And viruses such as H1N1 that make the jump from another species catch humans with their defences down.

The virus is not recognizable to our immune systems, Pourbohloul explained. "So we may be completely susceptible to the virus."

When most of the human population lacks immunity, the virus spreads much faster than a typical seasonal virus, which would bump up against potential hosts (that's us) with varying degrees of immunity that slow its spread.

"At the moment the H1N1 flu is burning through the population like a wildfire in a tinder-dry forest," said University of Toronto epidemiologist David Fisman, a researcher for the MITACS (Mathematics of Information Technology and Complex Systems) network based in Vancouver.

Each year's seasonal flu strains are a recirculation of slightly mutated old strains that many of us are already partly or completely immune to, explained Fisman.

Conversely, swine flu has the potential to infect almost everyone born since 1957, when it last faded out of existence as a human flu virus.

"People born before 1957 had a lot of exposure to H1N1 when they were kids," Fisman said. Health authorities do not consider people over 65 as a high-risk group for H1N1, even though they have a higher risk of death, because almost all of them are immune to it.

"We are dealing with two different kinds of risk," said Fisman."Young people are a very, very high risk of being infected with this virus, but a very low risk of a bad outcome."

"Older people are at low risk to contract the swine flu, but a high risk of bad outcome."

Predictive models help governments decide how best to deploy their resources.

Health authorities in British Columbia were faced with the question of whether to vaccinate the people most in danger of dying of flu-related illness — who tend to spread the flu slowly — or those who spread the virus faster, such as school-aged children, who are at minimal risk of serious illness or death.

“What they found in this case is that it didn’t matter,” said Fisman. The same number of people die either way.

British Columbia opted for a two-pronged approach, concentrating the vaccination program on those most at risk of serious illness or death should they contract H1N1 and acquiring more than one million doses of the anti-viral drug Tamiflu to offer to those who do catch the virus.

Tamiflu can ease the symptoms of influenza and shorten the period of illness if it is taken within 48 hours of the onset of symptoms.

Kendall believes the anti-viral strategy has reduced the number of people admitted to hospital, placed in intensive care and put on ventilators.

“Based on what we saw in Australia and New Zealand, we would have predicted more people being put on ventilators in B.C.,” Kendall said.

More than 70,000 prescriptions for Tamiflu have been filled in B.C. since the outbreak began.

Kendall was convinced early on that B.C. would not be able to contain the virus — in part because vaccine manufacturers could not deliver enough vaccine before the H1N1 infection peak projected in the mathematical models run by the BCCDC — and set about trying to manage it.

“It’s simple enough to calculate how many people you have to vaccinate to achieve herd immunity,” said Fisman, referring to the point at which even those without immunity are protected because it is so difficult for the virus to spread.

“The problem is when you start vaccinating.”

Vaccine manufacturers expected to deliver vaccine in November to head off the usual peak for seasonal flu, which starts around the end of December and they expect to know which strains to produce vaccines for quite early in the year.

But that’s not how things unfolded. Canada’s vaccine supplier GlaxoSmithKline was already producing seasonal flu vaccine when it became apparent that a different vaccine would be required to battle H1N1 and the company could not change tracks quickly.

Because the vaccine takes up to 14 days to provide protection against the virus, vaccinating during the period of peak infection has little effect on the course of the pandemic, Fisman said. “And this seems to be what we are doing now.”

The spread of the infection will increase immunity in the population faster than the most aggressive vaccination program, he said.

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