

# The flu pandemic: were we ready?

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Welcome to my weblog. I'm Sally O'Reilly, a freelance journalist based in Washington DC. I've been researching a book on pandemic preparedness. But now the time for preparation has run out.



## • 26 DECEMBER 2005 IT'S AN EMERGENCY — OFFICIAL

President George Bush has just addressed the press in the East Room of the White House. Here's the transcript: "At this hour, the [World Health Organization](#) has declared a full-scale pandemic influenza alert, with person-to-person spread lasting more than two weeks in Cambodia and Vietnam. During previous influenza pandemics in the United States, large numbers of people were ill, sought medical care, were hospitalized and died. On my orders, the [Department of Homeland Security](#) and the [Department of Health and Human Services](#) have today implemented the nation's draft [Pandemic Influenza Response and Preparedness Plan](#). It will serve as our road map, on how we as a nation, and as a member of the global health community, respond to the pandemic. We are ready. Thank you, and may God bless America."

Ready, my ass! I've reported on avian flu for almost a decade. The first thing I did on hearing Bush's address was to get on my cellphone to my husband, Jonathan. I told him to pack some bags and get ready to take the kids to my mother's house in Florida. "Remember all that stuff I told you about how a bird flu pandemic might hit the United States? Well, I think it's about to happen."

## • 28 DECEMBER 2005 JOURNEY TO THE SOURCE

Hanoi, Vietnam. I'm exhausted, and I can still taste the disinfectant they sprayed inside the [Doctors Without Borders](#) plane. I'm at the Bach Mai Hospital. It was here, three weeks ago, that what they're calling the 'Hanoi index case' fell sick. A Malaysian on business, he was transferred to a hospital in Hong Kong, where he died. Samples sent to labs in the WHO Global Influenza Surveillance Network showed he was infected with an H5N1 avian flu virus, but one that differed from earlier isolates. It had mutated.

But he won't have been the first patient with this mutated strain. As early as October there were hundreds of human H5N1 cases in the countryside south of here, but only a handful got picked up. Most went unnoticed by health authorities. Surveillance for human cases of flu in Vietnam has been patchy, and DNA diagnostic tests unreliable. WHO calls for more international funding were ignored. Now the virus has had three months to spread, pick up mutations and get better and better at jumping between humans.

What's weirdest is that there weren't any declared outbreaks of bird flu in chickens here recently. Farmers weren't exactly queuing up to declare cases, though. There'd been talk of setting up a global fund to help them cope with eradicating avian flu, to compensate them for lost trade. But it came to nothing. Then again, perhaps the virus came from ducks, which can be infected without showing symptoms.

## • 29 DECEMBER 2005 LIFE BEHIND THE MASK

Today, I hooked up with the 15-person international team from the WHO's [Global Outbreak Alert and Response Network](#). They're like the cast in that movie *Outbreak*, about some monkey virus.

We've got epidemiologists from the CDC — the US [Centers for Disease Control and Prevention](#) — along with mathematical modellers from Imperial and Emory, and virus hunters from the Pasteur Institute in Paris and the Robert Koch Institute in Germany. They're here to help hospitals control infection, and strengthen surveillance for human cases. Another team is doing the same in Cambodia. Across the world, health authorities are ramping up surveillance, trying to spot and isolate any exported cases as quickly as possible. They've grounded all commercial flights to and from the region. The chaos is way worse than with SARS.

Second evening here. The N95 face masks, which the WHO has advised us to wear, are the worst part. Your glasses steam up and you feel half-suffocated. I only take mine off to eat and drink. The team has a web video conference via a high-bandwidth satellite connection with WHO headquarters in Geneva. Its Department of Communicable Disease Surveillance and Response is coordinating the international response. Poor guys, there's just a handful of them.

They run through the latest stats. Here we go: 1,800 cases in Cambodia, 1,100 in Vietnam. Uh, oh ... six suspect cases in Tokyo and Johannesburg. So much for the flight bans. Overall, the mortality rate is 9%. That's nasty — worse than 1918. But it'll come down, as there's probably loads of asymptomatic cases.

The labs have finished sequencing the virus and we now have a template for an H5N1 vaccine. But it won't be ready for months. So for now, the WHO is trying a long shot, known as targeted antiviral prophylaxis.



http://www.nature.com/news/2005/050523/full/435400a.html

Basically, the idea is to blanket bomb all index cases, their households and people in the immediate vicinities with antiviral drugs such as Tamiflu. Computer models predict that if we do this, we might just stop the pandemic in its tracks. But there hasn't been enough modelling, and now we're doing the experiment for real.

Continued modelling will be vital, though, to work out how to deploy the limited supplies of Tamiflu we've got, and how long we need to treat people for the drug to work. Geneva informs us that the WHO international stockpile contains just 120,000 pills. WHO officials have been on the phone today with countries that have national stockpiles.

The politicians know that stopping the pandemic at source would be the best solution. But they're reluctant to donate drugs, as they'll have less for their own citizens if this approach fails. No point asking the United States — they've only got enough pills for 1% of the population. Britain and France have enough for a quarter of their populations. Will they spare us any? Will they hell.

### • 30 DECEMBER 2005 GETTING TO KNOW THE ENEMY

Geneva announces that the latest epidemiological studies say that the virus seems to have a 'basic reproductive number', or  $R_0$ , of between 1.4 and 2.0. This means that one case on average infects only one or two people. So if we can detect cases quickly and treat them and their contacts, the models suggest we could contain the virus most of the time. At the least, that might slow the pandemic and corral it in that region for a few months. That would win time to get a vaccine.

But we know there is a very short window. As time goes by, this virus will get better and better at transmitting between humans, and the  $R_0$  will increase. If it goes above 3, there's no way we'll contain it.

The latest news from Cambodia cheers us up. There's a slowdown in new cases. Control efforts seem to be keeping the lid on the virus there. But here it's a different story: the team is having difficulties finding and isolating contacts of patients in this crowded city.

This flu moves much faster than SARS because its incubation period is just two days. People are spreading the virus the day before they get sick, and asymptomatic patients without even being visibly ill. Tamiflu needs to be administered within two days of anyone showing symptoms.

As I wandered through the streets this afternoon, it wasn't looking good. People are walking around Hanoi coughing and spluttering. They've closed the schools, which is the right thing to do, but what are all the kids doing? Hanging out downtown enjoying the unexpected holiday.

### • 31 DECEMBER 2005 SIX MONTHS TO A VACCINE!

Vaccine teleconference. There are 125 people — companies, regulators, scientists — hooked in, each with their own agenda. It's impossible. There's a lot of talk on whether the six-month delay before there is any vaccine can be shortened. Scientists had been working on methods of growing virus for the vaccine in large vats of cultured animal cells instead of eggs. That could cut the delay to maybe three months. But progress had been held up by US Food and Drug Administration concerns over the safety of the cell lines. In any case, it would probably take at least two years before the existing factories could be switched over.

So we're stuck with eggs. A fast-track FDA approval for an H5N1 vaccine is under way. Fortunately, the US Department of Health and Human Services last year funded Sanofi-Pasteur to test a 'mock' H5N1 vaccine, using antigens from an earlier strain. So we don't need to start the approval procedure from scratch for the pandemic strain. We've gained some time.

But US production capacity — one factory — is only enough to cover up to 90 million people. The situation is better in the European Union: it can probably produce enough to cover 30% of its 450 million people. The predictable news is that every vaccine-producing nation has just nationalized its supply to serve its own citizens first. The 'have-not' countries aren't going to get any vaccine.

There's a lot of hindsight and recrimination at this meeting. The United States only tested vaccines at standard doses. Testing a vaccine containing an immune-boosting adjuvant might have allowed it to be diluted eightfold. Even with existing world production capacity, that would have let us produce 7.2 billion shots, enough to treat half the world's population. Now it's too late.

### • 25 JANUARY 2006 ESCAPING FROM HELL

Apologies for the long delay in posting. The past few weeks have been chaos. I was out with WHO teams from dawn to dusk as they tried in vain to stamp out the outbreak with drugs. People fell sick all over Hanoi and 1 in 50 of them died. Many of the worst affected felt fine in the morning, but were dead by lunchtime — blue in the face, gasping for air. At the overcrowded hospital, I saw victims collapsing, suffocating in their own lung fluid, blood streaming from their noses and gums. Others had longer ordeals, tortured by encephalitis as the virus ate into their brains, or overwhelmed by multiple organ failure. Panicky authorities transported corpses out to the fields by truck and burnt them on open pyres.

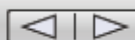
In a desperate last attempt to quell the outbreak, the WHO took what drugs it had left here and blindly treated whole sections of the city where transmission was most severe. The army was supposed to enforce quarantine, but many of them were sick as well, or had joined the exodus from the city. The fleeing people inevitably spread the disease to the countryside.

In a few days' time, the Vietnamese are supposed to celebrate Tet, the lunar new year festival. It's traditional to eat chicken — but not this year. My plane leaves tonight. I feel like I'm escaping from hell.



P. BRONSTEIN/GETTY IMAGES





http://www.nature.com/news/2005/050523/full/435400a.html

## • 2 FEBRUARY 2006 THE VIRUS SPREADS

Today, I was at a press conference at the [National Institutes of Health](#) in Bethesda. A guy from the CDC pointed to a giant screen, a map of the world dotted with red pixels. He said that they'd reckoned the virus might hit in two or more waves up to eight months apart, as in past epidemics. They'd hoped the first pandemic strain of H5N1 might be poorly contagious, and come back again with a vengeance after it had picked up more infectivity. By that time we might have had a vaccine. That was just a hunch, though. And it was wrong.

The mild pandemic in 1968 took almost a year to cross the globe. This one probably started around October. So we're now almost four months in. Look at that map! With the huge increase in passengers travelling by air, it's already lodged in 38 cities around the globe. The outline of Asia is barely visible beneath the swarm of red pixels.

Now the virus is in coastal cities on both sides of South America. It hit Europe two weeks ago, ripping through Paris in just 11 days. In the French capital alone, there were 2.5 million cases and 50,000 dead. That's par for the course — infection rate 25% and mortality 2%, similar to the 1918 pandemic. Extrapolate these numbers, and we're going to have over 30 million dead worldwide. In poor and densely populated countries like India, it could be worse.

Where's next, I asked. Based on passenger data — which had to be prised from the airlines — one epidemiologist was willing to make a guess. "Within two weeks, there." He traced his finger from San Diego to Los Angeles, up to San Francisco. Within another three to four weeks, it'll be the turn of the conurbations along the eastern seaboard.

## • 18 FEBRUARY 2006 THIS CAN'T BE HAPPENING

The United States is battered down before the storm. The government has outlawed all gatherings in public places. In past pandemics that never worked. But epidemiologists say that if we do it early on, it might slow the spread. Modelling also suggests that closing schools and universities is especially important as teenagers and young adults are among the worst hit. We just need to stop them from hanging out elsewhere. Stay at home, is the message blaring from every TV screen.

On [CNN](#) it's now round-the-clock coverage, with a red 'Pandemic' banner running across the bottom of the screen. "We're in the twenty-first century, and they're telling us about how to wash our hands properly, and practise 'respiratory etiquette'," exclaims Jonathan. "Why aren't there drugs? And I can't believe there's no vaccine. This can't be happening in America."

## • 20 FEBRUARY 2006 AMERICA SHUTS DOWN

The [Commissioned Corps of the U.S. Public Health Service](#), the nation's uniformed force of health professionals, has just been mobilized. The [US Northern Command](#) is in charge of the military response. Soldiers are setting up triage centres, anticipating overflowing emergency rooms and morgues. Images are coming in of tent cities being erected in New York's Central Park. Wards are being installed in schools and churches. Troops are on the streets. "There's going to be civil unrest," a general informed me on the phone this morning.

The CDC is in charge of national influenza surveillance, but it's a nightmare now. This is the peak season for ordinary flu, sparking false alarms and panic. Scant supplies of Tamiflu are being reserved for medical first responders, and essential services. (Stocking cash machines is an essential service, we learn.)

There's a lot of looting going on in pharmacies, but to no avail. The drugs are being distributed in convoys, with military jeeps in front and behind. Masks costing a dollar are being sold on street corners for \$20. E-mailed ads for counterfeit drugs are filling up my inbox.



## • 27 FEBRUARY 2006 EVERYONE FOR THEMSELVES

I watch the scenes of a society descending into chaos from the relative security of my mother's isolated home. Red tail lights snake to the horizon as people pour out of the cities. Half the doctors haven't turned up for work; many are either ill, or caring for loved ones.

Who should get the few mechanical respirators that can mean the difference between life and death? The youngest, or those with the best chances of pulling through? "Our leadership must be prepared to make calculated decisions that will force raw prioritization of life-saving resources," explains a colonel on CNN.

## • 17 MAY 2006 THE DUST SETTLES

The pandemic was [declared over](#) today. H5N1 will be back next year, or before that, as it replaces the existing seasonal flu strains. But by then, those who have recovered from this bout will have immunity, and we will have a vaccine. Pandemics move faster than governments or international bureaucracies, and the cost is hundreds of billions of dollars more than it would have been had we tackled avian flu in Asia in the first place, and invested in flu research. For millions of families, the cost isn't measured in dollars.

Watching all that military hardware on the streets made me think. We imagined we could encourage pharmaceutical companies to develop innovative vaccines and drugs by offering 'incentives' or modest subsidies. When the military knows it needs a fighter aircraft, it doesn't offer incentives to Lockheed Martin or Boeing. It pays them through procurement to develop the weapon to the specifications it wants.

Were we ready? Ready, my ass!

Sally O'Reilly's blog was written by Declan Butler, Nature's senior reporter in Paris.