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"Killing cats won't solve the problem and would lead to a population explosion of disease-carrying rodents"

location, there must have been many thousands of cat infections since the virus emerged, compared to 267 confirmed cases in humans. Every sick cat is a chance for the virus to adapt, and with renewed outbreaks this year in birds, people or both in China, Indonesia, Japan, South Korea, Hong Kong, Vietnam, Thailand, Egypt and Nigeria, it is getting plenty of such chances.

Killing cats won't solve the problem, Osterhaus warns. Like shooting wild birds, it is unlikely

to have much impact and could send infected animals elsewhere. It would also lead to a population explosion of disease-carrying rodents, which the cats normally keep in check.

"Cats must just be kept from eating sick chickens," Osterhaus says, though this will be a tall order in open-air markets across Asia and Africa, which are typically swarming with hungry cats. In Jakarta this week, officials are slaughtering thousands of banned backyard poultry – then handing them back for their owners to eat. Some of the birds could well be infected despite appearing healthy. It is hard to imagine the local cats not getting their share. ●



WILL THE DRUGS STILL WORK?

In late December, a man and his niece died of H5N1 flu in Gharbiyah province in Egypt's Nile delta. Both had been taking the antiviral drug Tamiflu and both were found to be infected with a virus containing a mutation that makes it partially resistant to the drug. They had been on Tamiflu for only two days, so the virus may already have been resistant when they caught it.

This is a worrying development. Tamiflu-resistant strains are not usually contagious because the mutations that make the virus resistant usually also cripple it. Countries with stockpiles of Tamiflu had been hoping this might limit the spread of drug-resistant strains during a pandemic, but resistance mutations have recently been seen that don't slow the virus's spread so much.

Marc Lipsitch and colleagues at the Harvard School of Public Health in Boston have used a computer model to assess the likely impact of such mutations. They showed that if a drug-resistance mutation emerges during a pandemic that cuts the virus's fitness by 20 per cent or less, the resistant strain will have so much advantage over non-resistant viruses that it will spread until perhaps a third or more of all cases are drug-resistant (*PLoS Medicine*, DOI: 10.1371/journal.pmed.0040015). This will happen, they predict, even if such strains emerge very rarely.

"This may mean fewer deaths, or more, depending on how the resistant virus behaves," says Lipsitch, who points to an unexpected bright spot of

his team's findings. "What surprised us is that even if the resistant strain spreads quite widely, its emergence will delay the peak of the pandemic by as much as a year." This happens because the resistant strain is less fit and also because it takes time to get going.

This is good news because as much as possible needs to be done to provide a breathing space at the beginning of a pandemic. "The whole point is to delay the pandemic until we can get a good vaccine made," Lipsitch says. The model showed that it should be possible to extend such a delay by closing schools or giving people a partially effective pre-pandemic vaccine against H5 flu.

An even bigger computer model of a flu pandemic published in the same journal (*PLoS Medicine*, DOI: 10.1371/journal.pmed.0040013), echoes these findings. Alessandro Vespignani at Indiana University, Bloomington, and colleagues found that as long as every person infected with pandemic flu infects fewer than two more people, antivirals could delay the pandemic peak by a year. During the 1918 flu pandemic, each infected person is thought to have spread it to 1.8 people, on average.

Since few of the countries where a pandemic virus is most likely to emerge have adequate stockpiles of antivirals, rich countries will need to pitch in to achieve this. Strategically sharing just 10 per cent of their stockpiles should be enough to make this strategy work, the study suggests.

