Summary of oral evidence: Professor Yoshihiro Kawaoka

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Professor Yoshihiro Kawaoka is a Professor of Virology in a joint appointment between the University of Wisconsin-Madison and the University of Tokyo. Professor Kawaoka spoke to the working group via teleconference. The views expressed were the personal views of Professor Kawaoka.

Members of the working group present were: Sir John Skehel, Professor Barry Furr, Dr John McCauley, Professor Andrew McMichael, Professor Karl Nicholson, Dr Geoffrey Schild and Professor Robin Weiss.

Key points

Scientific evidence and how it is used in policy-making

Professor Kawaoka has not been asked at the State or Federal levels to provide input into policy formulation for planning that the US and Japanese governments are undertaking to prepare for a potential pandemic. He does however support the current direction on most aspects of the US plan though questions the approach taken with the development of new vaccines. The reliance of the plans on antivirals and their unknown effectiveness against H5N1 virus infection was also raised. The preparedness plan is based on treatment with antiviral drugs for 5 days. The current treatment regimen for patients infected with H5N1 viruses suggests that the drugs will likely be administered for more than 5 days. Moreover, it is possible that higher doses may be needed for better efficacy. For this reason, the level of stockpiling of antiviral compounds for pandemic preparation appears to be insufficient. He believes that the pandemic preparedness plans in Japan are similar to those in the US, but no specific details have been determined in the former.

Biology of H5N1

Professor Kawaoka suggested that an important feature of the currently circulating H5N1 strain is its ability to infect both avian species and mammals. The virus could have been passing between birds and mammals, leading to increased virulence in mammals. A mutation found in the H5N1 virus that confers better replication in mammals supports this possibility.

The results from the human cases suggesting that the H5N1 virus infects cells deeper in the lungs are important. These findings provide a rational explanation for why H5N1 viruses rarely infect and spread from human to human, although they can replicate efficiently in the lungs. If the virus develops the ability to bind to different cell types present in the upper respiratory system then it might lose some of its current virulence.

Avian Vaccines

The multiple H5 vaccines on the market may not be of consistent quality and efficacy. Furthermore some of the poultry are not vaccinated, which will need to be addressed if control of H5N1 outbreaks will rely on vaccination. The H5N1 vaccines are effective in ducks; virus is shed, but at a reduced level.

Human Vaccines

Vaccines will need to be developed against a specific strain of avian influenza. Thus, stockpiling sufficient amounts of vaccine to accommodate the entire population prior to a pandemic will be difficult. Population priming with a vaccine is an area of research that has been discussed but is not featured in any planning or research programme. There are a number of liability issues that would make such preventative treatment difficult.

Likelihood of a Pandemic

It is not possible to make a prediction on the likelihood of an outbreak based on scientific evidence at the present time. It is however clear that we are off the 'baseline' with the human cases in SE Asia.