

Preparing for an influenza pandemic

To tie in with our News feature (p543), we reproduce this report, by **Graeme Smith**, from our recently published FIP congress supplement

The global threat of avian influenza means that military-style implementation of a pandemic plan is essential, according to York Zöllner, global health economics manager, Solvay Pharmaceuticals, Germany.

Speaking at the International Pharmaceutical Federation Congress in Cairo, Egypt, on September 8, Dr Zöllner explained that it was easy for the bird flu virus to infect humans where birds and people lived in close proximity, as in Asian bird markets. It was also possible that migratory birds from Asia could infect domestic poultry in other countries. The possibility of a pandemic arises if a person suffering from human flu catches bird flu, then that person acts as a “mixing vessel”, producing a new virus which can be easily transmitted among humans. “And no one’s immune system would be prepared,” he said.

Concern over a possible global outbreak is certainly justified. There had been three such outbreaks in the past century. In 1918, Spanish flu killed over 40 million people — including the young and fit. And the most conservative estimate from the World Health Organization of the global toll of a future pandemic suggests that there would be 233 million outpatient visits, 5.2 million hospital admissions and 7.4 million deaths. To date, of the 112 confirmed human cases of infection with the H5N1 influenza strain responsible for bird flu, 57 people (51 per cent) have died.

Six pandemic phases

Dr Zöllner described the characterisation and public health goals of the six phases of a pandemic. Phases 1 and 2 comprise the “inter-pandemic period”. Phase 1 is where no new virus subtypes are detected in humans and the risk of human infection is considered low. In this phase, the public health goal is to strengthen pandemic preparedness. Phase 2 is similar, except that circulating animal influenza viruses pose a substantial threat of human disease. Here the goals are to minimise the risk of transfer to humans and to detect and report rapidly if transmission occurs.

Phases 3, 4 and 5 comprise the “pandemic alert period”. In phase 3, there is human infection with the new flu subtype but no cases of human-to-human spread. The public health goals are to characterise rapidly the new subtype and to ensure early detection and notification of new cases. “Phase 3 is the case in Asia at the moment,” he said.

In phase 4, there would be small clusters of the disease with limited human-to-human transmission and the public health goal would be to contain the new virus within a limited area in order to delay spread. It would be at this stage that the WHO would release a seed virus so that the industry could begin to develop vaccines against the new strain, Dr Zöllner told participants.

Phase 5 would see larger clusters with human-to-human spread still localised but with the virus becoming increasingly transmissible. At this stage the public health requirement would be to maximise efforts to contain the disease and delay the spread.

Phase 6, the “pandemic period”, would see increased and sustained transmission of the new virus in the general population. All preparation strategies having been exhausted, the goal then would be to try to minimise the impact of the pandemic.

The WHO has prepared a checklist for influenza preparedness planning and Dr Zöllner went on to describe it. It has six components: preparing for an emergency, surveillance, case investigation and treatment, preventing spread of the disease in the community, maintaining essential services, and research and evaluation.

In preparing for an emergency, it is important to carry out a risk assessment, ie, to model the impact of the pandemic in terms of the number of anticipated outpatient visits, hospital admissions and deaths, as well as the economic impact that would result from people dying or not being able to work. The model should predict outcomes with and without treatment interventions.

There are important legal and ethical issues to consider. Legal matters could involve “over-ruling” existing pharmacy legislation to speed up the authorisation process for any new vaccine and to allow medicines such as anti-virals to be used off-licence. There are also human right issues to consider, for example, the enforcement of quarantine, compulsory vaccination and the possible commandeering of privately owned buildings as clinics. Ethical issues include the possibility of targeted vaccination and treatment of pre-defined priority groups.

During a pandemic, surveillance would involve counting deaths in suspected or confirmed cases of pandemic infection and monitoring workforce absenteeism in essential services, as well as monitoring vaccine use and effectiveness. To provide for case investigation and treatment, an emergency plan would need to consider diagnostic capacity, ie, there would need to be a local laboratory for routine diagnosis and typing of the virus and a reference laboratory for confirmation of infection. For clinical management, planners would need to decide on the location of treatment centres, admission criteria, and specimen collection and treatment protocols, as well as infection control in health care settings.

Preventing the spread of the disease would rely heavily on public health measures. People would need to be made aware of personal respiratory hygiene. There would need to be community infection control programmes and easy availability of antiviral treatments for early treatment while no vaccine is available.

There would be social distancing, quarantine, and travel and trade restrictions.

Countries should have in place routine vaccination programmes with defined target coverage. But pandemic vaccination programmes would be different and programmes would need to be drawn up for vaccination with the pandemic strain. Countries with a domestic vaccine-manufacturing base should develop timelines for manufacture, expedited testing, licensing and distribution of new vaccines. Those without a manufacturing base should develop contingency plans for procuring vaccines.

Priority list

In a pandemic, it would be necessary to establish a priority list for vaccination. At the top of the list should be bird cullers, veterinarians and farmers, followed by health care workers and workers in other essential services such as the police, fire fighters, the armed forces, government officials, utility workers, funeral and mortuary workers and people involved in the transportation of goods, food and medical supplies. Planners would need to decide how the vaccination programme is to be paid for and consider arrangements for the safe storage, distribution and administration of the vaccine. They would need to bear in mind particularly the possibility of theft of the vaccine by people not on any priority vaccination list. Maintenance of public order would be important.

During a pandemic essential services would have to be maintained and planners would have to consider this too. Particular attention would need to be paid to health care workers and the possible recruitment of more staff, perhaps from voluntary organisations. An important consideration would be excess mortality and culturally appropriate means of corpse disposal would need to be devised.

Finally, planners need to consider research and evaluation. They should determine risk factors in pre-pandemic phases but, once a pandemic is under way, they should focus on collecting impact measures. To turn research into future action, all measures should be evaluated and the results made public.

Concluding his presentation, Dr Zöllner said that military-style implementation of a pandemic plan is a must. But in the meantime, it is vital to increase inter-pandemic routine vaccination coverage and invest in tissue culture technologies other than vaccine production in hens’ eggs.

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