



Welcome to the seventh issue of *Influenza – Asian Focus*. This issue incorporates a new design that reflects our continuing efforts to improve the newsletter. The layout has been enhanced to make each issue more distinctive and provides greater flexibility in the presentation of articles. As the official newsletter of the Asia-Pacific Advisory Committee on Influenza (APACI), *Influenza – Asian Focus* continues to offer wide-ranging and in-depth coverage of important issues relating to the surveillance, control and prevention of influenza.

The worldwide attention gained by avian influenza A(H5N1) in Asia has ignited concerns about a potential influenza pandemic. More than 100 cases of human infection have been recorded, and the number of countries in which outbreaks in poultry have been reported is rising. While neither the severity nor the timing of the next pandemic can be predicted, the spread of the virus raises the probability of such an event occurring. The key issue confronting the Asia-Pacific region is how prepared it will be should a pandemic occur. This issue of *Influenza – Asian Focus* examines the current avian influenza situation and the introduction of preparation and control measures as countries in the region respond to developments.

APACI goes online!

The official website of the APACI is now up. Visit us at www.apaci-flu.org/apaci/ and register for free to gain access to back issues of *Influenza – Asian Focus*, PowerPoint presentations on influenza and other related resources.

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Dr Lance Jennings

Lance Jennings is a Senior Clinical Lecturer at the Christchurch School of Medicine and Health Sciences, University of Otago, New Zealand. He is a member of two New Zealand Ministry of Health advisory groups and was instrumental in the establishment of the National Influenza Immunisation Strategy Group. He is Chair of the Asia-Pacific Influenza Advisory Board, and has recently held WHO consultancies on influenza and measles.



Dr Ai Ee Ling

Ai Ee Ling is Director of the Virology Section, Department of Pathology and a Senior Consultant at the Singapore General Hospital. She is responsible for the National Influenza Centre and the National HIV Reference Laboratory in Singapore. Dr Ling is Vice-Chair of the Asia-Pacific Influenza Advisory Board.

The role of the Asia-Pacific Advisory Committee on Influenza

Mission statement

To promote influenza awareness in the Asia-Pacific region with the intent to improve the prevention and control of influenza.

The Asia-Pacific Advisory Committee on Influenza (APACI) was established in early 2002 to address epidemiological issues relating to influenza and the impact of the disease in Asia. The APACI members are highly regarded influenza and infectious disease experts from across the Asia-Pacific region. The Committee is a joint initiative of five pharmaceutical companies: Chiron Vaccines, GlaxoSmithKline, Roche, Sanofi Pasteur and Solvay Pharmaceuticals. The activities of the APACI are aligned with, and supplemental to, those of the World Health Organization (WHO). The APACI intends to work in cooperation with the WHO to complement its work on influenza surveillance, and promote influenza awareness throughout Asia.

Objectives

- To identify and develop activities that complement the WHO Global Agenda on Influenza Surveillance and Control.
- To assist the development of country-specific public awareness programmes on influenza.
- To promote influenza awareness among healthcare professionals in the region.
- To provide educational resources to support influenza awareness activities.
- To assist the process of establishing or reviewing country-specific recommendations for influenza prevention and control.
- To facilitate the timely access to, and supply of, influenza vaccines and antiviral medications.

Activities

Activities include:

- promoting influenza awareness to healthcare professionals in the region:
 - identifying country-specific key opinion leaders (KOLs)
 - publishing a regular newsletter (*Influenza – Asian Focus*)
 - producing peer-reviewed publications
- providing educational resources to support influenza awareness activities:
 - healthcare professional's resource package
 - case management guidelines

- speaker's kit
- continuing medical education programme
- assisting the process of establishing or reviewing country-specific recommendations for influenza prevention and control:
 - to establish a list of existing recommendations
 - to evaluate international recommendations in the Asia-Pacific context
 - to facilitate development of consensus statements and information exchange
- assisting the development of country-specific public awareness programmes:
 - identifying country-specific requirements
 - developing a strategy to increase country-specific public awareness
 - media kit
 - media training for KOLs
- identifying and developing activities that complement the WHO Global Agenda on Influenza Surveillance and Control.

Meeting highlights

The 9th meeting of the APACI was held in Hong Kong SAR, China, in October 2005. The 2-day meeting included feature presentations from guest speakers Malik Peiris from the Department of Microbiology, University of Hong Kong, Hong Kong SAR, China, and Masato Tashiro from the World Health Organization (WHO) Collaborating Center for Reference and Research on Influenza in Japan. Other guest attendees were Thomas Tsang and Ronald Lam from Hong Kong's Centre for Health Protection.

Avian influenza and pandemic planning featured largely on the agenda. APACI members from Thailand, Malaysia, Singapore, Korea, Australia, Taiwan and India discussed the status of influenza awareness promotion, surveillance and pandemic planning in their respective countries.

The APACI also developed a consensus statement on influenza pandemic preparedness, which was disseminated to regional and Hong Kong press in a briefing following the board meeting. Please see page 4 for further details.

H5N1 infection – reality or hype?

Malik Peiris is an expert on the epidemiology, evolution and pathogenesis of animal and human influenza at the Department of Microbiology, University of Hong Kong in Hong Kong SAR, China. Professor Peiris discusses the potential for the H5N1 virus to play a primary role in the emergence of a human influenza pandemic and provides insight on the situation created by the current outbreak.

How would an H5N1-like pandemic virus arise?

The H5N1 virus meets the first two prerequisites for the start of an influenza pandemic (See box).¹ Concerns now focus on the possibility of H5N1 improving its transmissibility via adaptive mutation or genetic reassortment in intermediate hosts, such as pigs.^{2,3} There is also debate on whether the reassorted virus will become attenuated once it adapts to a human host, although this appears unlikely.

Prerequisites for the start of a pandemic

- A novel virus subtype must emerge to which the general population will have no or little immunity.
- The new virus must be able to replicate in humans and cause serious illness.
- The new virus must be efficiently transmitted from one human to another.

What factors make H5N1 infection worrisome?

A comprehensive assessment of the current situation requires an understanding of the main factors influencing the potential for an H5N1-like pandemic influenza strain to emerge, including:

- its endemicity across a wide geographical area in Asia
- the increased likelihood of repeated opportunities for infecting humans
- augmented inter-species transmission to mammals and humans
- the potential for genetic reassortment in pigs or humans.

There may be places in Asia where reliable information on the spread of H5N1 infection may not be readily available, and where containment may be difficult. How could this affect the emergence of an H5N1-like epidemic?

Clearly surveillance activities in some parts of Asia are better than in others. This may lead to the lack of appreciation of the geographical range of H5N1 virus activity. The adaptation of this virus to humans could occur anywhere where virus circulation is occurring, not just from countries that report human disease or virus activity in poultry. Furthermore, the lack of awareness of virus activity will lead to non-recognition of human H5N1 disease because the disease is clinically one of a severe pneumonia. A proactive approach is required as this disease is very easy to miss.

How likely is it that an effective H5N1 vaccine will be developed?

Prototype H5N1 vaccines are in phase I clinical trials and the results on immunogenicity are awaited. However, unless an adjuvant is added to the vaccine, there are questions on the immunogenicity of the avian haemagglutinin. There are also questions on whether one vaccine will cross-protect against H5N1 viruses in all geographic regions, as H5N1 is not a homogeneous entity.

The investment in preparing for a possible pandemic is huge, particularly for developing Asian countries, which may most likely be hit first. Is this justified for H5N1?

The impact of an influenza pandemic – even a relatively mild one similar to the H3N2 pandemic in 1968 – is likely to be huge because of the intensification of global travel, the interdependence associated with globalisation and the impact of the media. In such a context, it would be foolhardy for us not to be prepared.

References

1. World Health Organization (WHO). *WHO consultation on priority public health interventions before and during an influenza pandemic*. WHO/CDS/CSR/RMD/2004.9. Geneva, Switzerland: WHO, 2004.
2. Chen H, Deng G, Li Z *et al*. The evolution of H5N1 influenza viruses in ducks in southern China. *Proc Natl Acad Sci USA* 2004; 101: 10452–7.
3. Choi YK, Nguyen TD, Ozaki H *et al*. Studies of H5N1 influenza virus infection of pigs by using viruses isolated in Vietnam and Thailand in 2004. *J Virol* 2005; 79: 10821–5.



Professor Paul Chan

Paul Kay-Sheung Chan is a Professor at the Department of Microbiology, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China. He is a member of several professional organisations involved in policymaking, grant assessment, education and research related to clinical virology and emerging infections.



Dr Nguyen Thi Hong Hanh

Nguyen Thi Hong Hanh is the Head of the Department of Virology and Vice-director of the National Institute of Hygiene and Epidemiology in Hanoi, Vietnam.

APACI consensus statement on influenza pandemic preparedness

The APACI issues recommendations on fighting influenza pandemics during Hong Kong press conference

APACI members announced a consensus statement on the influenza pandemic threat in the region at a press conference in Hong Kong on 10 October 2005, following discussions about the initiatives being undertaken to prepare for a pandemic in their respective countries.

Led by group chairman Lance Jennings and Hong Kong member Paul Chan, the press conference also featured Masato Tashiro from the WHO Global Influenza Programme and Thomas Tsang from Hong Kong's Centre for Health Protection, who responded to questions from the media regarding global and local issues. The speakers gave an overview of the APACI's objectives and achievements, highlighted the influenza disease burden in Hong Kong and presented the consensus statement.

Background

The current epidemic of H5N1 avian influenza has led to a high level of global concern over the potential for the emergence of a human pandemic influenza strain. The influenza epidemic has already had a substantial veterinary and economic impact within the Asia-Pacific region.

An influenza pandemic would cause millions of deaths in the region and many more people would fall seriously ill. This would overwhelm health resources, damage social infrastructures and have an economic impact exponentially greater than that resulting from the SARS epidemic.

Consensus statement

The APACI strongly encourages all countries to progress pandemic preparedness in line with the revised *WHO global influenza preparedness plan*.¹ Some countries will need external assistance to achieve this.

In particular, each country in the region should:

- strengthen current influenza surveillance in animals and humans for the timely identification of outbreaks
- control outbreaks in poultry to minimise transmission to humans and reduce the opportunities for a pandemic strain to emerge
- ensure sufficient laboratory capacity to detect influenza virus and to identify circulating influenza virus strains
- encourage annual influenza vaccination to reduce current and ongoing disease burden and to enhance pandemic vaccine production capacity and delivery
- consider the appropriate use of antiviral agents for influenza treatment and post-exposure prophylaxis, and encourage stockpiling for pandemic use.

Pandemic planning should go on

regardless of the outcome of the current H5N1 avian influenza outbreak, as other avian strains may also lead to a pandemic.

The APACI promotes influenza vaccination and stockpiling of antiviral agents as the key medical interventions for control of pandemic influenza.

Press conference results

About 40 journalists from the local press and regional newswires attended the press conference, which was the APACI's first. The event generated more than 35 pieces of news coverage in print, television and radio, highlighting the content of the consensus statement and the important role of influenza surveillance in pandemic planning.

The APACI hopes that this will be the first of many successful press events in the region to raise awareness of the importance of preparing for both a pandemic and seasonal influenza.

Reference

1. World Health Organization. *WHO global influenza preparedness plan. The role of WHO and recommendations for national measures before and during pandemics*. WHO/CDS/CSR/GIP/2005.5. Geneva: WHO; 2005. Available at: www.who.int/csr/resources/publications/influenza/en/WHO_CDS_CSR_GIP_2005_5.pdf



Press clipping from *The Standard*, a business newspaper covering Greater China, dated 11 October 2005.



Paul Chan, Lance Jennings, Masato Tashiro and Thomas Tsang (from left to right).



Press clipping from the *Oriental Daily* dated 11 October 2005. The headline reads 'Flu pandemic could hit any time'.

Influenza vaccine recommendations in the Asia-Pacific region

The vaccination of persons at risk for influenza complications is a key public health strategy in preventing morbidity and mortality. Differences in health priorities and diverse socio-economic factors across countries in the Asia-Pacific region make the comparison of local recommendations on vaccine coverage in high-risk groups a point of interest (Table 1).

In general, national influenza vaccine

guidelines in the region follow those set by recognised international organisations, particularly with regard to the annual vaccination of primary target groups (e.g. persons ≥ 65 years of age, aged care residents and persons with chronic medical conditions). Immunisation policies are expected to evolve and reflect new findings on the benefits and risks of influenza vaccination in other high-risk groups.

References

1. Harper SA, Fukuda K, Uyeki TM, Cox NJ, Bridges CB; Advisory Committee on Immunization Practices (ACIP), Centers for Disease Control and Prevention (CDC). Prevention and control of influenza. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2005; 54: 1–40.
2. World Health Organization. Influenza vaccines – WHO position paper. *Wkly Epidemiol Rec* 2005; 80: 277–8.

Table 1. Influenza vaccine recommendations in selected Asia-Pacific countries and health organisations

	All persons 65 years and over	All persons 50–60 years	Aged care residents	Contacts of risk	Younger people with chronic illnesses	Younger healthy persons	Children 6–24 months
Advisory Committee on Immunization Practices/ Centers for Disease Control and Prevention (USA) ¹	Yes	Yes	Yes	Yes	Yes	No	Yes
World Health Organization ²	Yes	No	Yes	Yes	Yes	No	No
Australia	Yes	No	Yes	Yes	Yes	No	No
Hong Kong	Yes	No	Yes	Yes	Yes	No	Yes
Malaysia	Yes	No	Yes	Yes	Yes	No	Yes
New Zealand	Yes	No	Yes	Yes	Yes	No	No
The Philippines	Yes	Yes	Yes	Yes	Yes	No	Yes
Republic of Korea	Yes	Yes	Yes	No	Yes	No	Yes
Singapore	Yes	No	Yes	Yes	Yes	No	Yes
Taiwan	Yes	No	Yes	Yes	Yes	No	Yes

Alan Hampson: a retrospective



Alan Hampson is a well-known influenza expert and former Deputy Director of the WHO Collaborating Centre for Reference and Research in Influenza in Melbourne, Australia. He has contributed significantly to influenza research, with the intention of safeguarding public health both in Australia and internationally.

Alan Hampson started his scientific career in 1958 with Commonwealth Serum Laboratories, then part of the Australian Department of Health.

Although his scientific achievements there involved diverse virological fields, his special interest was in influenza. His formal involvement in influenza began as early as 1967 when he worked on a commercial split-product influenza vaccine. In the 1970s, as a project leader for influenza vaccine studies, he played a key role in improving the vaccine production process.

In the mid-1980s, Mr Hampson became the Director of the National WHO Influenza Reference Centre. Due in large

part to his efforts, the centre grew to be widely recognised as one of the world’s most active and rigorous national centres in influenza research. As a result, the WHO designated the Centre as a Collaborating Centre for Reference and Research in 1992. This made the centre the third of its kind – after London and Atlanta – in the WHO’s global influenza programme and also the only one of its kind in the Southern Hemisphere.

As its Deputy Director, Mr Hampson was pivotal in expanding the centre’s expertise, capacity and collaboration with other laboratories. Mr Hampson was also instrumental in the development of the national influenza vaccination program-

me in Australia and contributed to other similar programmes internationally.

Throughout the mid-1990s, Mr Hampson campaigned for the establishment of pandemic planning in Australia. His efforts were eventually successful in 1997 when the H5 influenza breakout occurred in Hong Kong. Mr Hampson still serves as a member of the National Influenza Pandemic Action Committee and its various subcommittees and as a consultant for the WHO.

Alan Hampson is well regarded not just for his academic contributions, but also for developing international collaboration in virology and improving public health.

Influenza-related activities in Japan and WHO update



Professor Li-Min Huang

Li-Min Huang is a Professor at the National Taiwan University in the Department of Paediatrics and the Graduate Institute of Preventive Medicine in the College of Public Health. He is also Chief of the Division of Paediatric Infectious Diseases at National Taiwan University Hospital. He has served on the editorial boards of the *Journal of AIDS Prevention* and the *Journal of Microbiology, Immunology and Infection*.



Professor Ilina Isahak

Ilina Isahak is Head of the Department of Medical Microbiology and Immunology at University Kebangsaan in Kuala Lumpur, Malaysia. She is a member of several regional organisations and has been involved in the registration of new antiviral agents and vaccines in Malaysia.

Public health is a national responsibility that requires close collaboration and coordinated efforts among government bodies and health organisations. Masato Tashiro, Director of the WHO Collaborating Center for Reference and Research on Influenza at the National Institute of Infectious Diseases (NIID) in Tokyo, gives an overview of influenza activity during the 2004/05 influenza season, describes the Japanese national pandemic preparedness plan and provides influenza virus updates from the WHO.

Surveillance measures

Over the past 10 years, Japan has established a robust influenza vaccination programme and surveillance system. The Ministry of Health, Labour and Welfare (MHLW) spearheads the national influenza surveillance system, which comprises disease, virus and outbreak surveillance. The NIID (www.nih.go.jp/niid/index-e.html) works in partnership with the MHLW to monitor reports of influenza-like illness (ILI) from a total of 5000 sentinel sites throughout the country. Located within the NIID is the Infectious Disease Surveillance Center, the main function of which is to identify infectious disease trends and outbreaks.

Virus surveillance is conducted by the National Influenza Center in collaboration with 74 public health institutes run by local government and 2000 separate clinics, hospitals and nursing homes. More than 10,000 virus strains are isolated per year in Japan. In the latest season, influenza B and influenza A(H3N2) were the predominant strains (Figure 1). By contrast, the previous season showed a dominance of influenza A(H3N2) with a low proportion of influenza B isolates.

Pandemic planning

The Japanese government has established a national pandemic committee to develop guidelines for pandemic planning, including action plans and government responsibilities and roles. The principle of the pandemic plan is that the emergency response and crisis management should be based on the worst-case scenario.

At present, Japan has a population of over 130 million and an annual vaccine production volume of 20 million doses. The influenza vaccine coverage rate for individuals aged ≥ 65 years is approximately 60%. In a pandemic situation, approximately 50 million doses can be produced. Up to 320 million doses may be produced with an aluminium adjuvant, and any excess doses may be provided to neighbouring countries. Fifteen million antiviral courses are imported annually, and although only 6 million courses were used in the last season, the remaining 9 million are not considered to be official stockpiles but remain on the market. Government stockpiles are aimed at covering 20% of the population – with 1 million healthcare workers being the priority target.

WHO update

The NIID is a primary point of contact between the WHO and Asia for information on influenza. In terms of influenza trends in other countries, influenza A(H3N2) was predominant in the USA, the UK and the Southern Hemisphere during the past two seasons. The proportion of H3N2 and H1N1 isolates has declined, while type B influenza has increased.

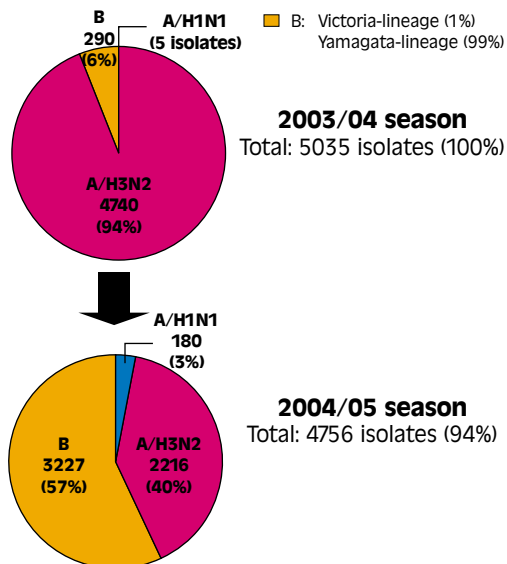


Figure 1. Isolation of influenza viruses in Japan (2003/04 and 2004/05).

Current WHO vaccine strain recommendations

2006 Southern Hemisphere season

- A/New Caledonia/20/99(H1N1)-like
- A/California/7/2004(H3N2)-like
- B/Malaysia/2506/2004-like

2006/07 Northern Hemisphere season

- A/New Caledonia/20/99(H1N1)-like
- A/Wisconsin/67/2005(H3N2)-like
- B/Malaysia/2506/2004-like

Influenza research and pandemic planning in Malaysia

The 9th APACI meeting afforded an opportunity for representatives from the Asia-Pacific region to share their countries' progress with regard to influenza vaccination and pandemic planning. In this article, Iina Isahak, Head of the Department of Medical Microbiology and Immunology at University Kebangsaan Malaysia in Kuala Lumpur, describes how the Malaysian government is taking precautions to combat the avian influenza outbreaks that are now affecting neighbouring countries.

Influenza research initiatives

Until recently, the impact of influenza was underestimated in Malaysia. Following the emergence of avian influenza, local studies have been conducted investigating the effectiveness and cost-benefit of influenza vaccination in special groups, including aged care residents, pilgrims attending the Hajj and working adults. Isolation of influenza viruses is also being carried out (Figure 1) and reports are being sent to the WHO Collaborating Centre for Reference and Research on Influenza in Australia.

Efforts are now being concentrated on improving influenza awareness among healthcare workers and the general population, and future national immunisation policies are expected to take the results of ongoing studies into account.

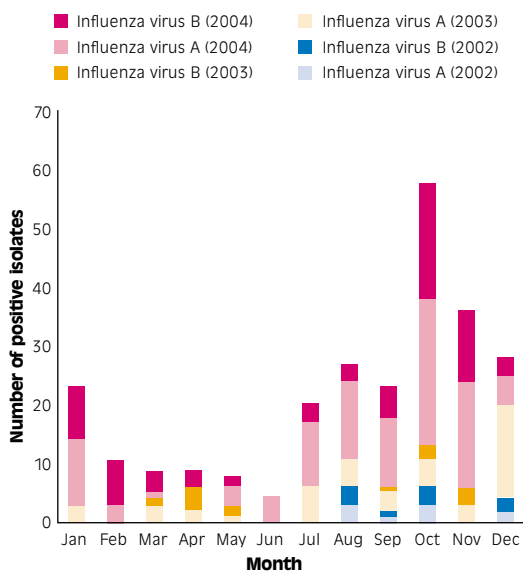


Figure 1. Influenza strains isolated in Malaysia (2002-2004).

Risk reduction strategies

Malaysia currently has a poultry stock of 160 million birds. In 2004, avian influenza outbreaks were recorded in Kelantan, a state bordering Thailand; these outbreaks were successfully contained through culling. To minimise the risk of domestic outbreaks of

avian influenza, sample checks on chickens, ducks and livestock in farms and on wild birds are being intensified nationwide. Malaysia is also tightening control at border areas where animal smuggling activity is highest and has banned the importation of pet birds, following a similar decision made by the European Union.

Pandemic planning

The Malaysian Ministry of Health began influenza pandemic planning in 2004, and several government bodies have been working in concert to produce documents such as guidelines on the management of avian influenza in humans.

The Malaysian national influenza pandemic preparedness and response plan, which is based on the WHO alert levels as published in 1999, puts the country at Phase 0 (the interpandemic period). A national inter-ministerial influenza pandemic committee and a national influenza pandemic planning committee have been established. An influenza surveillance system is made up of the following components:

- an influenza-like illness surveillance system, comprising select sentinel sites in a district
- a laboratory-based influenza surveillance system
- a hospital-based surveillance system
- rumour surveillance to register outbreaks of acute respiratory infection of unknown aetiology at local, national, regional and international levels.

Government hospitals at both national and district levels are also preparing for a potential human avian influenza pandemic using the same health principles and practices as those established during the 2003 SARS outbreak.

Finally, the Malaysian government has stepped up its efforts to stockpile oseltamivir and zanamivir. About 600,000 doses of oseltamivir have already been purchased and RM400 million has been earmarked for future purchases spread over a period of time to stockpile the drugs to cover at least 40% of the Malaysian population.



Dr Lalit Kant

Lalit Kant is Senior Deputy Director-General of the Indian Council of Medical Research, New Delhi, India, and heads the Division of Epidemiology and Communicable Diseases. Dr Kant is facilitating the set-up of a multi-site, epidemiological and virological influenza surveillance network in India.



Professor Cissy Kartasasmita

Cissy Kartasasmita is President Director of the Dr Hasan Sadikin General Hospital in Bandung, Indonesia. She participated in the Indonesian Ministry of Health's Health Technology Assessment on Influenza in Adults and Children in 2003 and is a member of the Immunization Working Group of the Indonesian Society of Pediatricians.

The Hong Kong SAR preparedness plan

The objective of pandemic planning is to enable individual countries and territories to become better prepared at recognising and managing an influenza pandemic. In this article, Paul Chan of the Department of Microbiology at the Chinese University of Hong Kong outlines the key features of the response system formulated by the government of Hong Kong SAR, China.

Hong Kong's three-level response plan is based on different risk-graded epidemiological scenarios, and addresses the possibility of prolonged existence of an influenza virus with pandemic potential.

- **'Alert Response Level' ('Yellow Alert')** – this refers to scenarios whereby highly pathogenic avian influenza (HPAI) outbreaks are confirmed in poultry populations outside Hong Kong, or in Hong Kong among

imported birds under quarantine, wild birds or birds in recreational parks, pet shops or the natural environment. The occurrence of human cases of avian influenza outside Hong Kong also triggers this response level.

- **'Serious Response Level' ('Red Alert')** – this comprises the confirmation of HPAI outbreaks in the poultry population or in their environment (i.e. retail markets, wholesale markets or farms in Hong Kong). The occurrence of human cases of avian influenza in Hong Kong without evidence of efficient human-to-human transmission also elicits this response level.
- **'Emergency Response Level'** – this is initiated when human-to-human transmission occurs overseas or in Hong Kong. This may also be activated when the WHO declares that an influenza pandemic is taking place.

The actions and recommendations under

each response level of the Hong Kong preparedness plan are designed to meet the goals set by the WHO for pandemic influenza planning. Details of the plan are available at the Centre for Health Protection website (www.chp.gov.hk), and a number of informative documents and leaflets targeting different groups of individuals can be found on the website's 'Influenza Page'.



Reporters interview APACI member Paul Chan at the press conference on influenza in Hong Kong.

Influenza vaccine coverage in Korea

The delivery and acceptance of recommended influenza vaccination policies is an ongoing challenge for healthcare providers and public health systems. This article details a report by Woo-Joo Kim of the Department of Internal Medicine at Korea University College of Medicine in Seoul, Republic of Korea, on coverage rates for, and attitudes towards, influenza vaccination in his country.

Questionnaire-based personal interviews of 1720 adults in the Republic of Korea have revealed an influenza vaccine coverage rate of 34.3% for the general adult population during the 2004/05 influenza season. The coverage for high-risk groups (61.3%) exceeded the national objective of 60%; this goal will soon be increased to 90%.

The factors most predictive of current influenza vaccination included influenza vaccination in the past year and an age of 65 years and over (Table 1). The primary motivation for undergoing vaccination was to avoid influenza infection and the common cold. The most frequently cited reason for declining vaccination was the

belief that one was healthy enough and did not require it. Results were similar for the general population and high-risk groups.

Unvaccinated individuals cited increased information about vaccine effectiveness and active recommendation by their physician or nurse as the most significant factors that could influence their decision to receive influenza vaccine in the future. However, a survey of about 300 healthcare workers at Korea University Guro Hospital revealed that a third of hospital nursing staff believed they had sufficient immunity to ward off infection, and two-

thirds of physicians claimed their schedules were too busy to accommodate influenza vaccination.¹ Educational efforts to improve attitudes and address misconceptions among healthcare workers should therefore be given prime consideration to help raise vaccine coverage rates.

Reference

1. Cheong HJ, Sohn JW, Choi SJ *et al.* Factors influencing decision regarding influenza vaccination: a survey of healthcare workers in one hospital in Korean. *Infect Chemother* 2004; 36: 213–8.

Table 1. Predictive factors for influenza vaccination in the South Korean population*

Factor	Odds ratio	95% confidence interval	P value
Influenza vaccination in 2003/04	23.93	17.75–32.25	< 0.001
Age ≥ 65 years	4.43	1.40–13.97	0.011
Belonging to high-risk group	2.69	0.85–8.54	0.093
Previous influenza-like illness	2.28	1.33–3.90	0.003
Female gender	1.71	1.19–2.45	0.004
Presence of chronic medical illness	1.67	0.60–4.68	0.328

* Based on multiple logistic regression analysis

Pandemic preparedness and influenza vaccine use in Taiwan

As a trade and transportation hub in the Asia-Pacific and a transit point for many migratory birds, Taiwan is a significant player in efforts to contain H5N1 within the region. Li-Min Huang of the Department of Pediatrics, College of Medicine at National Taiwan University in Taipei, discusses pandemic preparedness and the use of vaccines in Taiwan.

Approximately 2.5 million influenza vaccine doses are used annually in Taiwan, covering 9% of the population. A programme of free influenza vacci-

nation for individuals aged 65 years and above, those receiving care in retirement homes and workers in such establishments has been in place since 1998. The programme was extended to children aged 6–24 months in 2004 and, more recently, to workers in the poultry and swine industries. The country's vaccination rate has increased steadily (Figure 1) and, in 2003, the coverage was 68% in the elderly and 91% among healthcare professionals. The current goal for vaccination in the elderly is 80% (1,640,000 doses).

The national pandemic plan against influenza includes three main strategies (public health intervention, influenza vaccination and the use of antiviral agents) and four lines of defence, which involve:

- fighting infection abroad by helping neighbouring countries that are not as well resourced
- following border quarantine procedures
- controlling infection in the community
- setting up infection control hospitals.

The government plans to stockpile enough antiviral agents for 10% of the total population. A National Health Command Center has been set up to deal with any future public health crisis. In September 2005, the government established the Taiwan Influenza Committee for Strain Selection for the purpose of analysing domestic and international influenza data to predict circulating strains in the country. Further information on Taiwanese efforts to combat infectious disease may be found at the Taiwan Center for Disease Control website (www.cdc.gov.tw/en/index.asp).

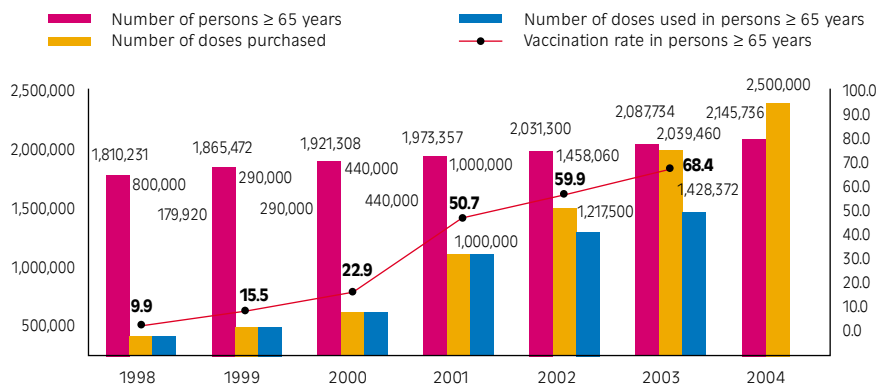


Figure 1. Procurement and usage of influenza vaccine in Taiwan (1998–2004).

Influenza in India: challenges and prospects

Influenza surveillance and pandemic planning is a complex process involving public health authorities, academia, the industry and the general public. India, with its population of more than 1 billion people separated into different states, faces added challenges in the coordination of its anti-influenza efforts. Lalit Kant, Deputy Director-General of the Indian Council of Medical Research (ICMR), provides this update on the interventions underway in his country.

India consists of 32 large states, which traditionally control their own health issues without the coordination of the central government. National influenza surveillance only began in earnest in

2000 under the direction of the ICMR. This year, it established a multi-site human influenza surveillance programme involving five regional centres in New Delhi, Dibrugarh, Kolkata, Chennai and Pune. This infrastructure is intended to test for human influenza virus and will help generate data on circulating influenza strains and seasonality, to be shared with a WHO Collaborating Centre.

The present challenges being faced by the centres in this programme include difficulties in obtaining and accepting funding, collecting data from rural settings and establishing the exact magnitude of influenza's impact and disease burden in such a large and diverse population.

With regard to the avian influenza situation, a joint monitoring group has been formed under the chairmanship of the Director-General of Health Services. The members of this group include representatives from the Ministry of Health, ICMR, the National Institute of Communicable Diseases and Department of Animal Husbandry, Dairying & Fisheries and the Representative Office of the WHO in India. Ministries in charge of home affairs, shipping and the environment are also on the alert. Thus far, central guidelines have been developed for the prevention, reporting and spread of H5N1 in poultry, and a ban has been enforced on the importation of poultry and poultry products from affected countries.



Professor Woo-Joo Kim

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Flu review

This new section of *Influenza – Asian Focus* features summaries of selected journal articles related to influenza disease and management.

Abramson JS, Neuzil KM, Tamblyn SE. Annual universal influenza vaccination: ready or not? *Clin Infect Dis* 2006; 42: 132–5.

This article reviews the potential obstacles to, and benefits of, implementing a programme of universal annual influenza vaccination on a national scale. Insight is provided by the experience in Ontario, Canada, where free influenza vaccination was offered to all persons aged 6 months and over beginning in the autumn of 2000. With this programme, overall vaccination coverage increased to 37% in Ontario compared with 23% in the rest of Canada, while coverage among persons aged 65 years and over increased from 60% to 73% in Ontario and from 46% to 63% in the rest of Canada.

Izurietta HS, Haber P, Wise RP *et al*. Adverse events reported following live, cold-adapted, intranasal influenza vaccine. *JAMA* 2005; 294: 2720–5.

This report examines the adverse events reported during the 2003/04 and the 2004/05 influenza seasons following the licensure of a trivalent live, attenuated influenza vaccine (LAIV-T) for intranasal

administration to healthy persons aged 5–49 years in the USA. There were seven reports of possible anaphylaxis, two reports of Guillain-Barré syndrome, one report of Bell's palsy and eight reports of asthma exacerbation among individuals with a prior asthma history. The results confirm the lack of unexpected serious risks with LAIV-T when used according to approved indications.

Acs N, Banhidy F, Puho E, Czeizel AE. Maternal influenza during pregnancy and risk of congenital abnormalities in offspring. *Birth Defects Res A Clin Mol Teratol* 2005; 73: 989–96.

This article describes a higher prevalence of isolated cleft lip and palate, neural tube defects and cardiovascular malformations found in the offspring of mothers who had influenza infection during the second and third months of pregnancy. The data is based on the large population-based Hungarian Case-Control Surveillance of Congenital Abnormalities between 1980 and 1996. The authors suggest that fever, rather than a direct teratogenic effect of the influenza virus, may be the cause, as an association was not found in women who received antipyretic therapy.

Avian influenza: a look back

The first documented infection of humans with an avian influenza virus occurred in Hong Kong SAR, China in 1997.¹ Eighteen human cases of influenza A(H5N1) virus infection were recorded, six of which were fatal. This event coincided with outbreaks of highly pathogenic avian influenza caused by the same strain in poultry at local farms and markets.

The outbreak had two striking features: the presence of primary viral pneumonia in severe cases and its tendency to afflict healthy young adults and children.² The virus was acquired directly from chickens, without the involvement of an intermediate host. Opportunities for further transmission were minimised through destruction of Hong Kong's entire poultry population within 3 days.

The 1997 Hong Kong 'bird flu' incident marked the acceptance of the role of avian hosts as a source of influenza viruses capable of causing severe illness with high mortality in humans. It alerted public health



authorities as to the importance of continuous surveillance of virus strains in humans and animals, and highlighted the significance of pandemic preparedness in combating emerging infections.

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Avian influenza: recent developments

H5N1 virus spreads to birds in Europe and Asia

After appearing in Turkey early in January 2006, the H5N1 virus has been detected in migratory birds in several European countries, most recently France and Germany. At Germany's Baltic Sea island of Ruegen, 59 cases have been confirmed in swans, ducks and geese. The French government also recently announced that the avian influenza virus had been found in a dead duck and possibly some swans.

New outbreaks of H5N1 infection in birds are being reported in countries across Europe, including Austria, Bulgaria, Greece, Hungary and Italy, Africa, mainly Nigeria and Egypt, the Middle East and Asia. India recently confirmed the presence of avian flu and has started mass culling of poultry.

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Donors pledge US\$1.9 billion to fight avian influenza

The international community has pledged US\$1.9 billion to fight avian influenza.

At the International Pledging Conference on Avian and Human Influenza in Beijing in January 2006, United Nations Secretary-General Kofi Annan also called for sharing of information, biological material and scientific expertise as well as finding ways to provide essential medicine to those in need.

"We will need to mount a massive effort – from upgrading veterinary systems and launching vaccination drives, to encouraging change in the ways people coexist with animals," he said.

Human infection with avian influenza virus has caused a total of 82 deaths to date in Cambodia, China, Indonesia, Thailand, Vietnam and Turkey.

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Economic impact of avian influenza in Asia

Avian influenza poses economic problems of collective concern to the Asia-Pacific community. Even if the virus does not infect humans, the associated costs could be high if a large number of countries impose bans on poultry imported from Asia, or if local consumers avoid buying domestic poultry.

In the event of an influenza pandemic, the virus could trigger a major crisis within today's interconnected global economy. Problems that could affect economic stability in Asia include difficulties in business operation if a large percentage of employees become unable or unwilling to come to work. Tourism and travel-related businesses could come to a standstill. If the disease results in widespread death and disability, a situation likely in developing countries, where the health systems are weaker – families could face severe financial hardship.

Based on the SARS experience in Asia, the World Bank projects that a pandemic arising from avian influenza

would cause a 2% loss of global gross domestic product, representing around US\$800 billion over 1 year.¹ Among Asian economies excluding Japan, a pandemic similar to the Hong Kong influenza pandemic of 1968 could cost between US\$113 billion and US\$300 billion in lost consumption, trade and investments, according to the Asian Development Bank (ADB).² Several efforts in conjunction with international organisations are underway to address the economic needs of affected countries, which will potentially reach US\$1 billion over the next 3 years.³

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Upcoming meetings

International

- International Collaboration on Planning for Pandemics**
Steyning, UK 2-5 March 2006
www.wiltonpark.org.uk/themes/economic/conference.aspx?confref=WPS06/19
- World Vaccine Congress**
Washington DC, USA 20-23 March 2006
www.lifescienceworld.com/2006/wvcm%5FCA/index.stm
- European Conference on Travel Medicine (ECTM5)**
Venice, Italy 23-25 March 2006
www.ectm5.org
- 16th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID)**
Nice, France 1-4 April 2006
www.akm.ch/eccmid2006
- 24th Annual Meeting of the European Society for Paediatric Infectious Diseases (ESPID)**
Basel, Switzerland 3-5 May 2006
www.kenes.com/espид
- 19th International Conference on Antiviral Research**
San Juan, Puerto Rico 7-11 May 2006
www.georgetown.edu/research/arc/ISAR/index.html
- American Thoracic Society 2006 International Conference**
San Diego, California, USA 19-24 May 2006
www.thoracic.org/sections/meetings-and-courses/international-conference/2006/index.html

Regional

- 3rd Asian Congress of Pediatric Infectious Diseases and 13th Pediatric Infectious Disease Society Annual Convention**
Cebu, Philippines 7-10 March 2006
www.asianpids.org/
- Preparing for Pandemic Influenza: The Avian Dimension and Other Emerging Threats
The Lancet Asia Medical Forum 2006**
Singapore 3-4 May 2006
www.asianmedicalforum.com/index.html/

Special announcement

The 7th Asia Pacific Congress for Medical Virology will be held at the India Habitat Centre in New Delhi, India, from 13 to 15 November 2006. Virology and related infectious disease experts in the Asia-Pacific region are greatly encouraged to attend the event and volunteer for speaking engagements. Please visit the congress website at www.apcmv2006.com for further details, or contact the congress Chairperson Dr Shobha Broor at sbroor@aiims.ac.in.

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