



Influenza

INFORMATION AND NEWS ON INFLUENZA

EDITORIAL

The 'Options for the Control of Influenza IV' meeting in Crete in September 2000 brought together more than 900 influenza researchers from around the world. The event was organised by ESWI and was generally a great success. The scientific data presented at the meeting (published in the 'Options IV' proceedings) and the exchange of ideas, facilitated by the excellent social programme and pleasant venue, made for an enjoyable and rewarding meeting.

Subsequent discussion with ESWI sponsors prompted the organisation of a new series of European meetings, which will alternate with the international 'Options' series, held every four years. The first European influenza meeting organised by ESWI will be held in October 2002 in Malta. The aims and format of these new European meetings will parallel those of the global interest meetings by addressing all scientific areas which contribute either directly or indirectly to limiting the impact of influenza in humans.

At the 'Options IV' meeting, ESWI also decided to sponsor a new platform for young scientists to organise small informal meetings in order to present and discuss their current research. The first of these conferences (organised by R. Fouchier, A. García-Sastre and S. Itamura) was held on the island of Texel, The Netherlands, from 2–4 November 2001. The theme of the meeting was orthomyxoviruses: presentations were made on their

evolution, structure, and replication, and on the diagnosis, epidemiology, immunology and vaccines of influenza. Approximately 50 young researchers were selected to attend the meeting. A survey conducted by questionnaire indicated that the majority of delegates found the conference of great value, and it was generally agreed that similar subsequent meetings would stimulate scientific collaboration and facilitate the exchange of ideas among a new generation of influenza researchers.

On 27 November a meeting organised by the EU was held in Brussels to discuss Europe's preparedness for a possible influenza pandemic. It was hosted by David Byrne, EU Commissioner for Public Health and Consumer Protection, and chaired by me on behalf of ESWI. It brought together representatives of the EU member states, the World Health Organisation (WHO), the relevant scientific disciplines and the pharmaceutical industry. Topics under discussion were measures needed to boost Europe's preparedness for an influenza pandemic to the level recommended by the WHO Influenza Pandemic Preparedness Plan, which was launched in Switzerland in April 1999. The international press were also invited to attend. The results of the meeting will be reported in the next edition of *Influenza* bulletin.

In addition to these three major initiatives by, or on behalf of, ESWI, individual ESWI members have actively participated in meetings and media

briefings to ensure influenza and its prevention strategies remain in the spotlight. In the future, this strategy will be one of ESWI's main tools to accomplish its mission.

A.D.M.E. Osterhaus
Chair, ESWI

CONTENTS

- PAGE 1** – Editorial
- PAGE 2** – Influenza vaccine strains for the 2002 Southern Hemisphere season
- Measures for the prevention of influenza in South America
- PAGE 3** – Influenza: an update from Hong Kong
- PAGE 4** – Routine influenza vaccination at age 50 years: US recommendations
- PAGE 5** – A novel immunisation programme in Canada
- A revolutionary change in the diagnosis and treatment of influenza in Japan
- PAGE 6** – Influenza vaccine: will vaccinating children protect the elderly?
- The burden of influenza on children: study update
- PAGE 7** – Influenza outbreaks on cruise ships: lessons learned
- PAGE 8** – Calendar of events

INFLUENZA VACCINE STRAINS FOR THE 2002 SOUTHERN HEMISPHERE SEASON

In September 2001, the World Health Organization (WHO) convened the annual consultation on the composition of influenza vaccines for the Southern Hemisphere. The following report is a summary of the data reviewed and the resulting vaccine recommendations for the 2002 season [1].

Influenza activity March–September 2001

Influenza A (H1N1) viruses circulated widely and were associated with outbreaks in the Americas, Asia and Oceania. Most isolates were antigenically similar to the previous vaccine strain, A/New Caledonia/20/99.

Influenza A (H3N2) viruses were associated with outbreaks in Africa and the Americas. Most isolates were antigenically similar to A/Moscow/10/99 and the previous vaccine strain, A/Panama/2007/99. Although some isolates were antigenically distinguishable from these strains, there was no representative variant.

Influenza B viruses were associated with outbreaks in Africa, the Americas and Europe. The majority of these viruses were antigenically closely related to B/Sichuan/379/99, but a few viruses isolated in Canada, China, Japan and the USA (Hawaii) were more closely related to the earlier strain B/Shangdong/7/97.

Vaccine studies

Vaccines containing A/New Caledonia/20/99 (H1N1), A/Panama/2007/99 (H3N2) and B/Johannesburg/5/99 strains stimulated satisfactory antibody responses to recent influenza A (H1N1), A (H3N2) and B strains. For influenza B viruses related to B/Shangdong/7/97, the antibody responses were lower in titre and frequency than responses to the influenza B vaccine strain.

Vaccine composition

Based on this information, the WHO recommended that the following influenza strains be included in

Southern Hemisphere vaccines for use in the 2002 season:

- an A/New Caledonia/20/99 (H1N1)-like strain
- an A/Moscow/10/99 (H3N2)-like strain*
- a B/Sichuan/379/99-like strain.†

J.M. Wood

National Institute for Biological Standards
and Control
Potters Bar, UK

* The most widely used vaccine strain is A/Panama/2007/99

† B/Guangdong/120/2000, B/Johannesburg/5/99 and B/Victoria/504/2000 are B/Sichuan/379/99-like viruses, and have all been used for vaccine production

Reference

1. Recommended composition of influenza virus vaccines for use in the 2002 influenza season. *Wkly Epidemiol Rec* 2001; 40: 311–314.

MEASURES FOR THE PREVENTION OF INFLUENZA IN SOUTH AMERICA

In 1995, a privately funded initiative to enhance surveillance and promote professional and public education on influenza was set up in Brazil. Called GROG Brazil (part of the Regional Influenza Observation Group), it consisted of a partnership between the Research Centre into Ageing at the Federal University of São Paulo, and the Instituto Adolfo Lutz, one of the National Influenza Laboratories.

Renamed Project VigiGripe, the study network quickly grew from nine surveillance sites to more than 80, located across Brazil. Its activities have increased the use of influenza vaccines from fewer than 100,000 doses in 1995 to approximately 14 million doses in 2000, 75% of which were publicly funded vaccinations of the elderly and 25% of which were private vaccinations of healthy adults and children.

In July and September 1998, the coordinators of Project VigiGripe met to discuss the need for a specific Southern Hemisphere vaccine. Guest speakers from Uruguay, Chile, Argentina and Brazil, as well as representatives from Australia, the UK, South Africa, the Centers for Disease Control and Prevention, and the WHO attended. Possibly in response to these meetings, the WHO issued the first recommendations for Southern Hemisphere vaccine composition. Throughout the 1990s, similar networks were set up in Argentina and Uruguay, and also briefly in Peru, Colombia and Venezuela. In the countries north of the equator, health authorities still lack sufficient information to decide on optimum vaccine composition for the region.

Today, 20 million influenza vaccine doses are distributed each year in South America. Neuraminidase inhibitors and

rapid point-of-care detection tests are licensed and their use is growing. Awareness of the need for prevention and control strategies is also increasing. In this context, and based on the positive experiences in Europe, some key scientists from the South Cone are presently planning the creation of a Scientific Working Group in Latin America. This initiative is expected to assist exchange of information, promote understanding of the burden of the disease, support local research and contribute to general awareness of the threat of a pandemic by liaising with health professionals, opinion leaders and health authorities. The initiative will be developed within the framework of other global activities in order to increase the awareness of influenza and its control measures.

E. Forleo, J. Toniolo-Neto
Directors, Project VigiGripe
Federal University of São Paulo
São Paulo, Brazil

INFLUENZA: AN UPDATE FROM HONG KONG

The human influenza surveillance system in Hong Kong has both active (sentinel) and passive (laboratory surveillance) components. Currently, H1N1 is the predominant influenza A subtype, accounting for 90% of isolates. This is in marked contrast to 1998 and 1999, when more than 99% of influenza A viruses were of the subtype H3N2 [1]. In association with this difference, it appears that the seasonality of influenza A has changed, from a peak occurring between January and March in 1998 and

... seasonality of influenza A has changed ... to a broad 'summer seasonality' in 2001.

1999, to a broad 'summer seasonality' in 2001. Influenza B activity has shown a moderate increase in recent years. Information on the clinical disease burden associated with influenza in tropical regions is still scarce, but more data are now becoming available. For example, a recent study in Hong Kong documented that influenza A is a significant contributor to febrile seizures in children [2].

In Hong Kong, influenza vaccination is strongly recommended for the institutionalised elderly (>65 years of age) and for targeted high-risk groups in long-stay hospital or institutional settings. Vaccination usually commences in November of each year.

The H5N1 virus that caused the 'bird flu' incident in 1997 (H5N1/97) [3,4] is now believed to be a reassortant [5]. While H5N1 viruses with this gene constellation have not been detected since the slaughter of poultry in December 1997, its putative precursors continue to circulate in poultry in the region. Since 1998, a number of measures were introduced to reduce the opportunity for the re-emergence of a 1997-like H5N1 virus in Hong Kong.

These include the centralised slaughter of aquatic poultry (to reduce the opportunity for reassortment between influenza viruses of aquatic and terrestrial poultry), as well as the serological screening of imported poultry for H5N1 viruses. These measures proved effective at excluding H5N1 viruses from Hong Kong's retail live poultry markets until 2001. However, in April and May 2001, ongoing surveillance of poultry led to the detection of the presence of H5N1 viruses in chicken in these markets. While these recently detected H5N1 viruses were pathogenic for poultry, they were genetically very different from the H5N1 virus of 1997. In view of their lethality in poultry and as a precautionary measure to prevent reassortment with other influenza viruses in the retail poultry markets which could

... in April and May 2001, ongoing surveillance of poultry led to the detection of the presence of H5N1 viruses ...

lead to the emergence of a virus similar to that of 1997, the Government of the Special Administrative Region (SAR) of Hong Kong slaughtered poultry in retail markets in May 2001. Human infections associated with H5N1 were not detected on this occasion.

Three instances of human infection with animal influenza viruses were reported in Hong Kong in 1999. These involved two children with avian H9N2 infection [6,7] and one with a swine H3N2 infection [8]. All three infections were mild and self-limiting with no evidence of significant human-human transmission. These viruses are similar to viruses known to be present in poultry and pigs, respectively. Inter-species transmission of avian (H9N2) and human (A/Sydney/97-like) H3N2 viruses to pigs has been documented.

Hong Kong's experience illustrates the importance of good animal, as well as human, influenza surveillance.

J.S.M. Peiris, Y. Guan, K.F. Shortridge
Department of Microbiology
The University of Hong Kong
Hong Kong SAR

References

1. Department of Health, Hong Kong SAR (2001) Public Health and Disease Surveillance. <http://www.info.gov.hk/dh>
2. Chiu SS, Tse CY, Lau YL, Peiris M. Influenza A infection is an important cause of febrile seizures. *Pediatrics* 2001; 108: E63.
3. Yuen KY, Chan PK, Peiris M, et al. Clinical features and rapid viral diagnosis of human disease associated with avian influenza A H5N1 virus. *Lancet* 1998; 351: 467-471.
4. Claas ECJ, Osterhaus ADME, van Beek R, et al. Human influenza A H5N1 virus related to a highly pathogenic avian influenza virus. *Lancet* 1998; 351: 472-477.
5. Guan Y, Shortridge KF, Krauss S, Webster RG. Molecular characterization of H9N2 viruses: were they the donors of the "internal" genes of H5N1 viruses in Hong Kong? *Proc Natl Acad Sci USA* 1999; 96: 9363-9367.
6. Peiris M, Yuen KY, Leung CW, et al. Human infection with influenza H9N2. *Lancet* 1999; 354: 916-917.
7. Lin YP, Shaw M, Gregory V, et al. Avian-to-human transmission of H9N2 subtype influenza A viruses: relationship between H9N2 and H5N1 human isolates. *Proc Natl Acad Sci USA* 2000; 97: 9654-9658.
8. Gregory V, Lim W, Cameron K, et al. Infection of a child in Hong Kong by an influenza A H3N2 virus closely related to viruses circulating in European pigs. *J Gen Virol* 2001; 82: 1397-1406.

ROUTINE INFLUENZA VACCINATION AT AGE 50 YEARS: US RECOMMENDATIONS

Taken together, influenza and pneumonia are the sixth leading cause of death in the USA, and the fifth leading cause of death in the elderly. Influenza causes approximately 20,000 deaths annually, with this figure climbing to $\geq 40,000$ excess deaths (i.e. nine deaths above the seasonal baseline) in some epidemics [1]. Furthermore, each year there are some 114,000 excess influenza-related hospitalisations, climbing to over 300,000 during some epidemics [1,2].

The mortality rate from influenza rises in middle age and is highest in persons with chronic medical conditions, such as chronic obstructive lung disease, cardiovascular disease and diabetes mellitus. The elderly, due in part to a high

*... in the USA ...
influenza causes
approximately 20,000
deaths annually ...*

incidence of chronic medical conditions, have the highest age-specific influenza mortality rates of any population group, and account for at least 90% of all deaths. However, the mortality rate from influenza is higher in middle-aged persons with chronic medical conditions than in healthy elderly persons. Data from the 1997 National Health Interview Survey (NHIS) show that 24–32% of those aged 50–64 years have an underlying medical condition that places them at high risk of complications from influenza infections [1].

Influenza vaccine efficacy

The effectiveness of the influenza vaccine in preventing or attenuating illness depends primarily on:

- the degree of similarity between the virus strains in the vaccine and those circulating in the population
- the age and immunocompetence of the vaccine recipient.

Where there is a good match between vaccine and circulating viruses, vaccination has been shown to prevent illness in 70–90% of healthy people aged <60 years [1]. Where the virus match is poor, efficacy is lower. A study of working adults aged 18–64 years revealed that influenza vaccination reduced episodes of upper respiratory tract illness by 25%, sick leave from work by 43% and visits to physicians by 44% [3].

Rationale for vaccination

Although many people 50–64 years of age have a high-risk condition such as asthma, diabetes mellitus or heart disease, only a minority are vaccinated, despite recommendations to the contrary. Data from the 1997 NHIS show that only 40–41% of the high-risk people in this age group were vaccinated. A possible reason for this is that manual or computerised reminder systems based on the occurrence of a high-risk condition are more difficult to implement than those based on age alone. Many people at high-risk are not aware of their increased susceptibility to disease. Immunisation based on high-risk conditions has not been successful for other diseases such as hepatitis B. Considering the burden of influenza and the cost-effectiveness of

vaccination, the American Academy of Family Physicians in 1999 lowered the age for annual routine vaccination to 50 years. In 2000, this recommendation was reiterated by the Advisory Committee on Immunization Practices.

Recommendations

In the USA, routine annual vaccination is recommended for all persons aged ≥ 50 years. In the event of a vaccine shortage, subjects at high risk because of chronic medical conditions, as well as the elderly, have priority for vaccination.

R.K. Zimmerman

*Departments of Family Medicine and
Clinical Epidemiology
and Health Services Administration
University of Pittsburgh
Pittsburgh, PA, USA*

References

1. Centers for Disease Control and Prevention. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morb Mortal Wkly Rep* 2000; 49: 1–38.
2. Simonsen L, Clarke MJ, Williamson GD, et al. The impact of influenza epidemics on mortality: introducing a severity index. *Am J Public Health* 1997; 87: 1944–1950.
3. Nichols KL, Lind A, Margolis KL, et al. The effectiveness of vaccination against influenza in healthy, working adults. *N Engl J Med* 1995; 333: 889–893.

To be put on the mailing list for the *Influenza* bulletin please contact:

ESWI management
Els De Backker

c/o Link Inc, Tolstraat 9, 2000 Antwerp, Belgium

Tel: +32 3 232 93 42. Fax: +32 3 232 17 04. E-mail: eswi@ping.be

A NOVEL IMMUNISATION PROGRAMME IN CANADA

The Universal Influenza Immunization Program (UIIP) in Ontario, Canada, is an expansion of an existing programme covering persons at high risk of complications, staff of long-term care facilities, and healthcare and emergency service workers. It was the first in North America to give influenza vaccine free of charge to all 11.5 million residents of Ontario during the season 2000–01.

Rationale

The primary objective of the UIIP was to reduce annual overcrowding of healthcare facilities during the influenza season, since a 10% increase in hospitalisations has been observed during this time [1]. The benefits of immunisation in population subgroups, e.g. the elderly, healthy adults and children [2,3,4], as well as in 'high priority' groups, are well documented. Vaccination has substantial health and economic benefits in terms of mitigating the impact of influenza on workplace productivity and reducing community transmissions [3,4].

Implementation

The immunisation programme for the 2000–01 season began on 1 October

with the 'high priority' groups, including those at risk of complications, healthcare and emergency service workers. Others were immunised from mid-November onwards. Over five million doses of vaccine were distributed. Preliminary data indicate that approximately 44% of residents ≥ 16 years of age were vaccinated, as were an estimated 20% of children up to the age of 4 years and approximately 30% of the 5–18 year age group.

Although it is too early to draw conclusions on the UIIP, initial results are very encouraging. During the 2000–01 season, Ontario had 854 influenza cases – 20.5% of the total reported cases in Canada. This compares with 2,899 influenza cases in Ontario in the 1999–2000 season, which amounted to 41% of the country-wide total during that time. Further, in 2000–01, Ontario had only nine outbreaks in long-term care facilities and hospitals, compared with 341 outbreaks during the 1999–2000 season. However, these data must be interpreted with caution as influenza seasons vary in severity from year to year.

M. Varia, B. Kawa, C. D' Cunha
Public Health Branch
Ontario Ministry of Health and
Long-Term Care
Toronto, Ontario, Canada

References

1. Menec V, Roos N, Nowicki D, et al. Seasonal patterns of Winnipeg hospital use. Manitoba Centre for Health Policy and Evaluation, 1999.
2. Nichol KL, Margolis KL, Wuorenma J, et al. The efficacy and cost effectiveness of vaccination against influenza amongst elderly persons living in the community. *N Engl J Med* 1994; 331: 778–784.
3. Nichol KL, Lind A, Margolis KL, et al. The effectiveness of vaccination against influenza in healthy, working adults. *N Engl J Med* 1995; 333: 889–893.
4. Reichert TA, Sugaya N, Fedson DS, et al. The Japanese experience with vaccinating schoolchildren against influenza. *N Engl J Med* 2001; 344: 889–896.

Ontario Ministry of Health and Long-Term Care website:
<http://www.gov.on.ca/health>

A REVOLUTIONARY CHANGE IN THE DIAGNOSIS AND TREATMENT OF INFLUENZA IN JAPAN

In Japan, the diagnosis and treatment of influenza virus infection has advanced dramatically in recent years. Rapid diagnostic tests are now routinely performed in hospitals and clinics during the winter months. For Japanese clinicians, a viral infection can be diagnosed immediately rather than having to diagnose an 'influenza-like' illness. The rapid test is not merely a diagnostic measure, but has helped to improve understanding of influenza virus infection.

Treatment

Amantadine was approved in Japan in 1998. It is effective only for the treatment of influenza type A. Zanamivir and oseltamivir have also been approved:

these are neuraminidase inhibitors, and are effective against influenza types A and B. Significantly, and somewhat surprisingly, the treatment of influenza using neuraminidase inhibitors is covered by national health insurance. As a result, Japan has probably the highest neuraminidase inhibitor use in the world, since all citizens are enrolled in the public health insurance programme.

Cost

How will the enormous medical costs of such treatment be offset? This will primarily be achieved by decreasing the inappropriate prescription of expensive antibiotics, since Japanese doctors, using the rapid diagnostic tests, will now be able to correctly prescribe

antivirals, such as neuraminidase inhibitors.

The future

This revolutionary change in therapy should markedly alleviate the burden of influenza in Japan. However, although the benefits of the programme are expected to be great, the economic cost has not been fully calculated. The appearance of influenza viruses that are resistant to neuraminidase inhibitors must also be carefully monitored, as must the side effects of this therapy.

N. Sugaya
Department of Pediatrics
Nippon Kokan Hospital
Kanagawa, Japan

INFLUENZA VACCINE: WILL VACCINATING CHILDREN PROTECT THE ELDERLY?

Vaccination policies worldwide are based on the premise that the best way to protect a particular person against influenza is to vaccinate that person. In the USA, the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices recommends immunisation of the elderly, those with underlying chronic disease, healthcare professionals, etc. This policy is supported by retrospective studies documenting the efficacy and cost-effectiveness of immunisation of high-risk populations.

A study of an alternative approach was reported recently [1]. In the Asian influenza pandemic of 1957–58, Japanese public health authorities found that school attendance played an important role in disseminating the disease to adults. Japan therefore based its national influenza vaccine policy on the immunisation of schoolchildren. From 1962, schoolchildren were given the highest priority for vaccination, and in 1977, their immunisation became mandatory. Immunisation of schoolchildren was discontinued in 1994.

The evolution of overall and pneumonia/influenza-related death rates in the Japanese population during the period when this policy was effective was compared with rates in the USA, where high-risk populations were immunised.

When immunisation of schoolchildren was initiated, excess mortality rates in Japan dropped from a level 3–4 times higher than in the USA, to a similar level. As childhood immunisation declined in the 1990s, excess mortality rates increased substantially over US rates.

A much smaller US study found that vaccination of 85% of schoolchildren reduced the attack rate of influenza-like illness in adults to one-third of that in a control community [2].

Immunisation of schoolchildren thus appears to protect adults against influenza. However, any change of immunisation policy in the USA is not possible without:

- a contemporary study in the USA confirming that this policy is effective
- addressing the ethical issues raised by a policy in which one population is immunised in order to benefit another population
- development of an influenza vaccine specifically for children.

The policies of immunisation of schoolchildren and of high-risk groups will probably be perceived as complementary rather than mutually exclusive, with the entire population becoming the target for annual immunisation.

Although this may appear effective, it is critical to consider the economic cost of adding 50 million children to the present US influenza immunisation programme.

T.C. Eickhoff

Division of Infectious Disease
University of Colorado Health
Sciences Center
Denver, CO, USA

This article is a modified version of an editorial published in June 2001 in *Infectious Disease News*.

References

1. Reichert TA, Sugaya N, Fedson DS, et al. The Japanese experience with vaccinating schoolchildren against influenza. *N Engl J Med* 2001; 344: 889–896.
2. Monto AS, Davenport FM, Napier JA, Francis T Jr. Modification of an outbreak of influenza in Tecumseh, Michigan by vaccination of schoolchildren. *J Infect Dis* 1970; 122: 16–25.

THE BURDEN OF INFLUENZA ON CHILDREN: STUDY UPDATE

From October 2000 to May 2001, a prospective cohort study was undertaken to provide new evidence for the total burden of influenza in children. The study was carried out at the Department of Pediatrics, Turku University Hospital, Finland, where a separate clinic was set up for this purpose. Prior to commencement of the study, informed consent and demographic data were obtained for a total of 1,449 children (486 children <3 years of age; 483 children 3–6 years of age; 480 children 7–12 years of age). During each episode of respiratory infection, the child was examined at the

study clinic and a nasal swab obtained to determine the viral aetiology of infection. The child's parents also filled in a daily symptom card over the entire study period.

1,170 participants made a total of 6,121 visits to the study clinic (including control visits). The total number of specimens for viral detection was 3,637. All specimens were subjected to virus culture, but the complete results of the polymerase chain reaction (PCR) assays (e.g. influenza, rhinovirus, enterovirus) are not yet available.

The first episode of influenza A in the study population was detected on 3 November, 2000. Despite continuous detection of the virus over the following weeks, influenza activity remained low throughout the remainder of 2000. In late January 2001, however, influenza A activity increased rapidly, peaking in February, and falling to zero again by the end of March.

With the exception of a single sporadic episode in early January, influenza B activity was first detected at the end of February, with moderate numbers of cases until the end of April. From April ▶

onwards, all influenza episodes were of type B, except for a few that remained untyped. The last case of influenza B was recorded on 20 May, the final day of the study.

The total number of culture-confirmed clinical influenza infections was 261. Influenza A was found in 204 (78%)

... 251 children had culture-confirmed influenza infections, corresponding to an incidence rate of at least 17.3%.

cases, and influenza B in 48 (18%); in nine (3%) cases the virus remained untyped. Ten children had separate episodes of both influenza A and B

during the study. A total of 251 children had culture-confirmed influenza infections, corresponding to an incidence rate of at least 17.3%. It remains to be seen whether the results of the PCR assays will substantially increase these numbers. Full analysis of the data will be reported shortly.

The influenza season of 2000–01 was generally considered mild in Europe, possibly because the prevailing subtype of influenza A was H1N1, which is reported to cause epidemics of lower severity in children than those caused by H3N2 [1]. Determination of the total burden of influenza in children also requires data from a more typical H3N2 season, and an extension of the study to cover the influenza season of 2001–02 is currently being prepared.

This study was funded in part by ESWI, who provided invaluable support. The full results of the study will be presented in the very near future.

T. Heikkinen

Department of Pediatrics
Turku University Hospital
Turku, Finland

Reference

1. Wright PF, Thompson J, Karzon DT. Differing virulence of H1N1 and H3N2 influenza strains. *Am J Epidemiol* 1980; 112: 814–819.

INFLUENZA OUTBREAKS ON CRUISE SHIPS: LESSONS LEARNED

Influenza outbreaks on cruise ships are recognised and reported all year round [1,2]. Cruise ships are semi-enclosed environments in which passengers and crew from around the world intermingle, creating ideal conditions for the dissemination of influenza viruses. Both passengers and crew may serve as reservoirs of infection and play a role in spreading illness worldwide when they return home.

Two recent outbreaks – one on New York–Montreal cruises in early autumn 1997, the other on a cruise in Northern European waters in summer 2000 – demonstrate the utility of ship-based prospective prevention and control measures to interrupt influenza transmission [1,2]. These outbreaks highlight the need for cruise ships to establish region-specific expected baseline levels of respiratory illnesses, so that outbreaks can be identified earlier, and for cruise line companies to adopt effective surveillance and control protocols that include the following key elements:

- year-round passive surveillance using standard case definitions
- active surveillance if an outbreak is detected

- use of rapid diagnostic testing and viral cultures
- isolation of anyone with an influenza-like illness
- use of antiviral agents for treatment and for prophylaxis (if indicated)
- monitoring the results of intervention
- notification of passengers, crew and public health officials in the event of an outbreak.

Travellers known to be at high risk of developing complications following influenza infection who were not vaccinated during the preceding influenza season should consider receiving vaccine before their cruise vacation, regardless of

Cruise line companies should consider... crew vaccination programmes.

the time of year. Cruise line companies should consider implementing routine annual crew vaccination programmes [3].

U. Bodnar

Division of Global Migration and Quarantine
Centers for Disease Control and Prevention
Atlanta, GA, USA

References

1. Miller JM, Tam TWS, Maloney S, et al. Cruise ships: high-risk passengers and the global spread of new influenza viruses. *Clin Infect Dis* 2000; 31: 433–438.
2. Centers for Disease Control and Prevention. Influenza B virus outbreak on a cruise ship – Northern Europe, 2000. *Morb Mortal Wkly Rep* 2001; 50: 137–140.
3. Bodnar UR, Maloney SM, Fielding KL, et al. Preliminary guidelines for the prevention and control of influenza-like illness among passengers and crew members on cruise ships. Atlanta, Georgia: US Department of Health and Human Services, CDC, National Center for Infectious Diseases, 1999.

CALENDAR OF EVENTS

DATE/VENUE	TITLE	ORGANISER/SECRETARIAT
29 November– 2 December 2001 Curacao, Antilles	4th International Symposium on Respiratory Viral Infections	The Macrae Group 230 East 79th Street, suite 8E New York, NY 10021 USA Tel: +1 212 988 7732 Fax: +1 212 717 1222
9–11 January 2002 London, UK	Viral Zoonoses Joint Meeting of the Society for General Microbiology Clinical Virology Group, the European Society for Clinical Virology, and the European Society for Veterinary Virology	Mrs J. Dunn Society for General Microbiology Marlborough House Basingstoke Road Spencers Wood Reading RG7 1AG UK Tel: +44 118 988 1805 Fax: +44 118 988 5656
4–8 March 2002 Sarasota, FL, USA	Review and Update of Infectious Diseases in Adult Medicine	American Medical Seminars Inc. PO Box 6129 Sarasota, FL 34278 USA Tel: +1 800 325 1961 Fax: +1 941 388 1766
11–14 March 2002 Singapore	10th International Congress on Infectious Diseases	N.R. Stein International Society for Infectious Diseases 181 Longwood Avenue Boston, MA 02115 USA Tel: +1 617 277 0551 Fax: +1 617 731 1541
17–21 March 2002 Prague, Czech Republic	15th International Conference on Antiviral Research	ISAR/ICAR Courtesy Associates 2000 L Street, NW Suite 710 Washington, DC 20036 USA Tel: +1 202 973 8690 Fax: +1 202 331 0111
24–27 April 2002 Milan, Italy	12th European Congress of Clinical Microbiology and Infectious Diseases	ECCMID Clarastrasse 57 Basel, CH-4005 Switzerland Tel: +41 61 686 7711 Fax: +41 61 686 7788
27 July–1 August 2002 Paris, France	The World of Microbes: 12th International Congress of Virology	Dr Deubel IUMS Congress Secretariat 2, Place de la Porte Maillot 75017 Paris France Tel: +33 1 45 68 8000 Fax: +33 1 40 68 2740

INFLUENZA BULLETIN

The *Influenza* bulletin is published for the European Scientific Working Group on Influenza by Gardiner-Caldwell Communications Ltd. The opinions expressed in this publication should not be construed as those of the publisher or sponsors.

Consult full prescribing information on any drugs or devices discussed.



Gardiner-Caldwell Communications Ltd
Victoria Mill, Windmill Street, Macclesfield, Cheshire SK11 7HQ, UK
© 2001 Gardiner-Caldwell Communications Limited

The organisations supporting ESWI include: Aventis Pasteur MSD, Chiron Vaccines SpA, Crucell NV, Evans Vaccines Ltd, GlaxoSmithKline, F. Hoffmann-La Roche Ltd, Janssen-Cilag Ltd, Solvay Pharmaceuticals and Wyeth-Lederle Vaccines.

EDITORIAL BOARD

Professor C. Hannoun
Montrouge, France

Professor A.D.M.E. Osterhaus
Rotterdam, The Netherlands

Dr A.M. Palache
Weesp, The Netherlands

ESWI MEMBERS

Professor O. Ruuskanen
Turku, Finland

Dr D.J. Smith
Santa Fe, New Mexico/
Cambridge, UK

Dr R. Snacken
Brussels, Belgium

Professor T. Szucs
Zurich, Switzerland

Professor S. van der Werf
Paris, France

Dr G.A. van Essen
Amersfoort, The Netherlands

Professor A.D.M.E. Osterhaus
Rotterdam, The Netherlands

SENIOR MEMBERS

Professor F. Ambrosch
Vienna, Austria

Professor C. Hannoun
Montrouge, France

Professor G.J. Ligthart
Amsterdam, The Netherlands

Professor C. Scholtissek
Giessen, Germany

Dr B. Tůmová
Prague, Czech Republic

ADVISERS

Dr D. Lavanchy
Geneva, Switzerland

Dr A.M. Palache
Weesp, The Netherlands