Options for the Control of Influenza VIII

Cape Town, South Africa
5-10 September 2013

Programme Book

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isirv
International Society for Influenza and other Respiratory Virus Diseases

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Minister's Greetings

It is my honor to welcome you to the *Options for Control of Influenza VIII Conference*, in this beautiful city of Cape Town. This is the first Options Conference to be held in Africa, so we are proud that South Africa is the host.

Every three years, Options brings together more than a thousand laboratory scientists, doctors, veterinarians, policymakers, epidemiologists, journalists, and those in private industry from around the world for the largest international scientific conference for influenza. The conference will provide comprehensive state-of-the-art scientific information for all disciplines involved in influenza prevention, control and treatment, including seasonal influenza and pandemic planning.

This conference has great significance, as the world recovers from the recent 2009 H1N1 pandemic. We should however, not lose focus of the other influenza strains that have impending pandemic potential such as H5N1 and the most recent H7N9. We should also be reminded that much work still need to be done in area such as: enhancing influenza surveillance and communicating risks, promoting collaboration and training among researchers and other stakeholders across countries and continents as well as advancing and sharing new technologies for vaccine development.

The South African Ministry of Health would like to take this opportunity to thank the *International Society for Influenza and other Respiratory Virus Diseases* for hosting this conference in our country; and wish the organizers and delegates fruitful deliberations that will strengthen influenza control nationally, regionally and globally.

Sincerely,

Dr Aaron Motsoaledi
Minister of Health

Welcome Letter

Options for the Control of Influenza VIII

Cape Town, South Africa • 5-10 September 2013

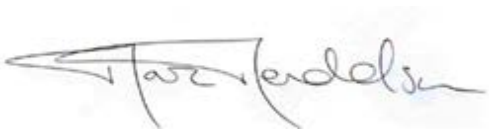
On behalf of the Organizing Committee, I would like to warmly welcome you to Cape Town, the Mother City, for the *Options for the Control of Influenza VIII Conference*. This is the first time that *Options* has been held in Africa, ensuring that the *Options* series of meetings has now visited each of the 5 continents. This provides a unique opportunity to stimulate research, clinical, and public health influenza activities on the African continent. Therefore, a vote of thanks to **isirv** for having faith in South Africa as a venue for this conference, particularly at a time of global recession.

It is often said that the only predictable thing about influenza is its unpredictability, and in that respect, it never ceases to disappoint. The emergence of H7N9 in China is the latest example of our precarious relationship with animals and the continuing importance of the animal-human interface. A dedicated workshop has been fashioned to highlight the key issues in the H7N9 outbreak. Furthermore, this year's feature cornerstone session on Saturday is devoted to the animal-human interface and promises to be another highlight of the conference. During this session, we will debate some of the ethical issues around dual use and gain of function research, which ignited around H5N1 and has now been brought back to the forefront with respect to planned experiments for H7N9.

New to this year's *Options VIII* conference will be poster walkabouts, where international experts in the field will lead visits to a themed set of related posters. We hope that this will enhance the presentation and interaction around some of the outstanding posters that were submitted.

I wish to thank everyone who has worked so hard to make the *Options VIII* meeting possible. Thank you to members of the Organizing and Scientific Committees who have dedicated their time and expertise to developing this excellent and challenging programme. A special vote of thanks to Stacey Schultz-Cherry, co-chair of the scientific committee, who has worked harder than anyone to bring the *Options VIII* programme together. I would like to acknowledge the generous financial support of our meeting sponsors, and thank Lynne Pryor, Lynda Browning, and all at Integress Meetings and Events, the company that has done an excellent job in organizing this meeting.

Finally, on behalf of the Organizing and Scientific Committees of *Options VIII*, I wish you a stimulating, vibrant, and enjoyable conference. I hope very much that you will take time to experience some of the wonders that this magical city offers, be it the beaches, mountains, or vineyards and to experience the warmth and hospitality of the South African people.



Marc Mendelson
Conference Chair, Options for the Control of Influenza VIII
Head of Division of Infectious Diseases and HIV Medicine
Groote Schuur Hospital
University of Cape Town
Cape Town, South Africa

Welcome from Scientific Committee

Dear Friends and Colleagues,

Welcome to the first *Options* meeting to be held in Africa. The *Options for the Control of Influenza* has evolved into the biggest scientific gathering in the world of influenza. Options VIII will be unique, providing updates on the evolving H7N9 situation, a panel discussion on the pros and cons of the controversial influenza gain-of-function research, poster walk-about sessions meant to enhance the prominence of work presented as posters, and highlighting our next generation of influenza researchers by having our young scientists co-convene workshop sessions. *Options VIII* offers a wonderful and timely platform for the world's premier researchers, public health experts, government representatives and veterinarians to exchange ideas and discuss critical recent data on influenza virus infection in humans and animals and to discuss its impact on human and animal health.

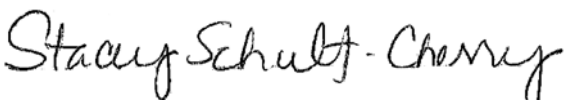
On behalf of the Scientific Committee, we would like to thank all authors of abstracts submitted to the *Options for the Control of Influenza VIII* for your enthusiastic participation. Your contributions, over 700 abstracts in total, have ensured that this meeting will be a most productive one and ensures its success. The abstracts will be distributed on a flash drive and classified according to the workshop topics where they will be presented. Given the large numbers of outstanding abstracts, exceptional research will be found within the poster sessions. We encourage participants to not only enjoy the workshop and poster sessions, but to participate in the host-led poster walk-about, which we hope will enhance the prominence of the work presented in the poster session.

Finally, we sincerely thank all the members of the Scientific and Organizing Committees for their outstanding efforts in organizing the *Options* scientific program and in reviewing large numbers of abstracts. We hope that everyone will have a wonderful and productive meeting as well as taking the time to enjoy beautiful Cape Town.

Wishing you a successful meeting.

Sincerely,

Wolfgang Preiser
Scientific Committee Chair
Head: Division of Medical Virology
Department of Pathology
Faculty of Health Sciences
Stellenbosch University and National Health Laboratory Service (NHLS)
Stellenbosch, South Africa



Stacey Schultz-Cherry
Scientific Committee Co-Chair
Associate Member, Department of Infectious Diseases
St Jude Children's Research Hospital
Memphis, TN USA

isirv
International Society for Influenza and other Respiratory Virus Diseases

On behalf of the International Society for Influenza and other Respiratory Virus Diseases (isirv), I would like to welcome you to the *Options for the Control of Influenza* Conference in Cape Town. This is the eighth of the series of *Options* meetings that have taken place every 3 to 4 years since the first meeting in the United States in 1985. This is the first of the *Options* meetings to take place on the African continent.

The *Options* meetings are not only the largest of the scientific meetings devoted exclusively to influenza but are unique in bringing together participants from all over the world representing disciplines as diverse as molecular virology, clinical medicine, epidemiology, health economics, and sociology, together with participants from public health institutions, governments, and industry. The meeting provides the opportunity for sharing of the latest research findings and updates on the state of the art in all aspects of influenza. It also provides the opportunity for interdisciplinary discussion both within and outside the formal scientific programme of the Conference.

isirv is privileged to have been able to take on the responsibility for ensuring that this unique and important series of meetings is continued. **isirv** was formed as a scientifically independent membership based organisation with the aim of promoting work to prevent, detect, treat, and control influenza and other respiratory virus diseases throughout the world. In addition to *Options*, **isirv** organises scientific meetings in a wide range of aspects of influenza and other respiratory virus diseases and publishes the successful journal "Influenza and other Respiratory Viruses". Please take advantage of your membership of **isirv**, through attendance at this Conference, and visit the **isirv** stand to find out about the range of **isirv** activities that will be of interest to you.

isirv would not, however, be able to fulfill its responsibility to ensure the continuation of the *Options* tradition without our local hosts in Cape Town, our conference organisers (Integress), and the scientific and organizing committees chaired by Marc Mendelson, Stacey Schultz-Cherry, and Wolfgang Preiser. We offer them all our most sincere thanks.

On behalf of the Board of **isirv**, I wish all participants at the *Options for the Control of Influenza VIII* meeting a lively, provocative, and productive time, and an enjoyable stay in Cape Town.

John Watson
Chairman
International Society of Influenza and other Respiratory Virus Diseases (**isirv**)

Welcome to the *Options for the Control of Influenza VIII* Conference

5-10 September 2013 • Cape Town International Convention Centre • Cape Town, South Africa

Options for the Control of Influenza began as a small scientific symposium in Keystone, Colorado in 1985. Nearly 30 years later, the *Options* conference has become the largest international conference devoted exclusively to all facets of influenza, from basic science to healthcare policy. In order to reach a global audience, this prestigious conference is held approximately every 3 years in a different city. Previous *Options* conference locations include: Courchevel, France, 1992; Cairns, Australia, 1996; Crete, Greece, 2000; Okinawa, Japan, 2003; Toronto, Canada, 2007; and Hong Kong, SAR, China, 2010.

The *Options VIII* conference takes place approximately 6 months after avian influenza A (H7N9) was first observed in China, and just a few short months after the finding of the first potential human-to-human transmission of the same virus. In addition to responding to this global issue, many of this year's presentations demonstrate advances in seasonal and pandemic influenza research, current epidemiological studies, updates on infection control, developments in antiviral resistance, and controversies in clinical care.

Goals and objectives for the *Options VIII* conference:

- Provide comprehensive scientific guidance for all stakeholders involved in influenza prevention, control, and treatment, including seasonal and pandemic planning
- Promote genuine international and multidisciplinary collaboration, supporting the full spectrum of influenza research, from basic science to the development of new vaccines and antiviral agents to epidemiology and control programs
- Provide a collegial atmosphere where scientists working in public health and in agricultural or veterinary agencies may exchange information to develop collaborative approaches for the control and prevention of pandemic influenza
- Maximize the opportunities for informal discussions and exchange of ideas between representatives of government agencies, academia, and industry

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Principal Specialist and Head
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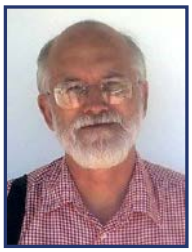

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Faculty of Health Sciences
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GATES Fellowship

Lagare Adamou, P2-625
Centre de Recherche Medicale et Sanitaire, Niger
Influenza surveillance among cases with influenza-like illness and severe acute respiratory illness in Niger, 2009-2012

Mejbah Bhuiyan, P1-424
icddr,b, Bangladesh
The role of community-acquired influenza patients and healthcare workers in transmitting influenza infections in tertiary hospitals in Bangladesh

Timothy Byaruhanga, P1-329
National Influenza Centre, Uganda
Assessing the burden of influenza in relation to age, its impact on out-patients and hospitalized patients: a case study in Uganda

Mamoona Chaudhry, LBA-P2-047
University of Veterinary and Animal Sciences, Pakistan
Prevalence of avian influenza and associated risk factors in live birds retail stalls of Lahore district, Pakistan

Abrar Chughtai, P1-416 and P1-417
Home country: Pakistan, Current: University of New South Wales Syndney, Australia
Availability, consistency and evidence-base of policies and guidelines on the use of mask and respirator to protect hospital health care workers: a global analysis
Use of cloth masks in the practice of infection control – evidence and policy gaps

Radu Cojocaru, LBA-P2-017
National Centre for Public Health, Republic of Moldova
Strengthening of the surveillance system for Influenza, ARI and SARI in the Republic of Moldova

Martin Herbas Ekat
Cheik Anta Diop University, Senegal

Narendra Gemawat
Hindustan Chamber Chikitsalaya, India

Lionel Gresh
Sustainable Sciences Institute, Nicaragua

Phuong Hoang, P2-518
National Influenza Center, Vietnam
The genetic match between vaccine strains and circulating seasonal influenza A viruses in Vietnam, 2001-2009

Iaryna Iosyk, LBA-P2-011
I. Ya. Horbachevsky Ternopil State Medical University, Ukraine
Etiological structure of acute respiratory viral infections in among epidemical period and treatment

Md. Saiful Islam, P2-469
icddr,b, Bangladesh
Poultry-human interactions in a wholesale live bird market in Dhaka, Bangladesh: the potential for bird-to-human transmission of avian influenza viruses

Khanthamaly Viengphone
US Centers for Disease Control and Prevention
Lao People's Democratic Republic

Binod Kumar, P2-696
Vallabhbhai Patel Chest Institute University of Delhi, India
Sequence-specific cleavage of influenza A virus M2 gene transcript by circular DNAzymes: prolonged inhibition of viral RNA translation and replication

Issaka Maman, P2-631
Institut National D'Hygiene, Togo
Implementation of influenza-like-illness sentinel surveillance in Togo

Abdullah Mamun, P2-674
Home country: Bangladesh, Current: University of British Columbia, Canada
Influenza among people of 50 years and above: national influenza surveillance in Bangladesh, 2008-2012

Clement Meseko
National Veterinary Research Institute, Nigeria

Jolynne Mokaya, P1-120
University of Nairobi, Kenya
Influenza virus infection in Kenya

Jayati Mullick, P1-252
National Institute of Virology, India
Genetic analysis of low pathogenic avian influenza H4N6 and H9N2 viruses circulating in West Bengal, India reveals genetic diversity

Huong Giang Ngo, LBA-P2-012
National Institute of Hygiene and Epidemiology, Vietnam
Oseltamivir resistance among influenza viruses: surveillance in northern Viet Nam, 2009–2012

Thach Nguyen, P2-594
National Institute of Hygiene and Epidemiology, Vietnam
Evolution and diversity of HPAI H5N1 clade 2.3.4 in Vietnam from 2005 to 2010

Rogan Taboko Nyenti
Cameroon Medical Women Association, Cameroon

Stephen Ocholla
US Army Medical Research Unit, Kenya

Abdoulaye Ouattara, P2-689
Institute Pasteur de Cote d'Ivoire, Côte d'Ivoire
Non-influenza viral etiology associated with acute respiratory infection in children under five years in Cote d'Ivoire

Shailesh Pawar, P1-402
National Institute of Virology – MCC, India
Inactivation of infectivity of avian influenza viruses using BPL, formalin and ether for preparation of candidate vaccines

Kimbowa Peter, P1-258
Joint Clinical Research Center, Uganda
Proteinase-inhibitor theory of pathogenesis of influenza

Norosoa Razanajatova, O-987
Institut Pasteur, Madagascar
Etiology of Two-years Hospital-based Surveillance of Severe Acute Respiratory Infection in Madagascar

Naila Siddique, P2-472 and P2-579
National Reference Lab for Poultry Diseases NARC, Pakistan
Sequence and phylogenetic comparison of human and avian Influenza H3 strains reveals introduction of American and Eurasian lineages in Pakistan

Isolation and sequence analysis of reassortant low pathogenic Avian Influenza virus H4N6 from Duck and Chicken in live bird markets of Pakistan

Karhemere Stomy, LBA-P2-034
Institut National de Recherche Biomedicale (INRB), The Democratic Republic of the Congo

Evaluation of the influenza sentinel surveillance system, Kinshasa, DR Congo, 2009- 2011

Gelila Tiyo, P2-663
Ethiopian Health Nutrition Research Institute, Ethiopia
Influenza surveillance at ILI sentinel sites in Addis Ababa, Ethiopia: epidemiological and virological findings from 2012

Makanga Tonny
Center for HIV, STD & TB Prevention, Uganda

Erdene-Ochir Tseren-Ochir, P2-589
State Central Veterinary Laboratory, Mongolia
The characterization and pathogenicity of H5N1 highly pathogenic avian influenza virus strains isolated from migratory wild birds in Mongolia (2005-2010)

Bishnu Prasad Upadhyay, P2-455
National Public Health Laboratory, Nepal
Molecular epidemiology and serological characterization of influenza virus infection in Nepal

Promising Investigator Scholarship Recipients

SCHOLARSHIP Promising Investigator Scholarship

Aubree Gordon, P1-119 and O-869
Business/Institution University of California Berkeley, United States
The Nicaraguan Influenza Birth Cohort Study: methods and results from the first year
Household Transmission of Influenza in Nicaragua

Erik Karlsson, LBA-P2-028, LBA-P2-029, P2-496, and O-838
St Jude Children's Research Hospital, United States
Pathological and immunological comparison of H5N1 and H7N9 viruses in mice

The use of statins to combat viral and bacterial pneumonia in obese mice

Risk analysis of a novel avian H3N8 virus isolated from harbor seals

The obese host as a driver of influenza virus evolution

Florian Krammer, P2-548
Icahn School of Medicine at Mount Sinai, United States
A universal influenza virus vaccine based on the stalk domain of the hemagglutinin

Kristin G-I Mohn, O-862
University of Bergen, Norway
A study of the local and systemic immune responses after intranasal influenza vaccination in children

Philippe Noriel Pascua, O-873
Chungbuk National University, Republic of Korea
Characterization of H3N2pM-like and novel reassortant H3N1 swine viruses with pandemic H1N1 2009-like segments isolated in Korea

Saranya Sridhar, P1-360 and O-824
Imperial College of London, United Kingdom
CD8+ T cells correlate with protection against symptomatic illness following natural pandemic influenza infection in humans

Higher incidence of pandemic influenza natural infection in the third wave compared to the second wave in an adult community cohort in the UK

Sophie Valkenburg , O-879
The University of Hong Kong, China
Universal influenza vaccinia vaccine requires CD4+ T cells for heterosubtypic protection

Carolien van de Sandt, O-853
Erasmus MC, Netherlands
Human cytotoxic T lymphocytes directed to seasonal influenza A viruses cross-react with the newly emerging H7N9 virus

Debby van Riel, P1-115
Erasmus MC, Netherlands
Novel avian-origin influenza A (H7N9) virus attaches to epithelium in both upper and lower respiratory tract of humans

Huachen Zhu, P1-110
The University of Hong Kong, China
The emergence of the 2013 H7N9 and related viruses in China

International Research Scholarship Recipients

SCHOLARSHIP International Research Scholarship

Fahmida Chowdhury, O-903
Respiratory Viruses Research Group, Centre for Communicable Diseases, icddr,b, Bangladesh
Drug dispensing practices for acute respiratory infections and availability of oseltamivir through pharmacies, in Dhaka, Bangladesh

Doudou Diop, P1-164
Institut de Recherche pour le Developpement, Senegal
Informing future policy for influenza vaccination programs in sub-Saharan Africa: forging a path for decision-making

Gideon Emukule, O-804, O-847, P1-406, & P2-614
Kenya Medical Research Institute/Centers for Disease Control and Prevention (KEMRI/CDC), Kenya
The role of HIV in the household introduction and transmission of influenza in an urban setting, Nairobi, Kenya, 2008-2011

The Burden of Influenza and RSV among inpatients and outpatients in Rural Western Kenya, 2009 -2012
Uptake and effectiveness of a trivalent inactivated influenza vaccine in urban and rural Kenya, 2010-2012
Predicting mortality among hospitalized children with respiratory illness in Western Kenya, 2009 -2012

Pedro Jimenez-Bluhm, O-909
University of Wisconsin-Madison, United States
Surveillance and characterization of Influenza viruses circulating in the central region of Chile

Hoa Le, O-856
Oxford University Clinical Research Unit, Vietnam
Protection against influenza infection was associated with neutralizing antibodies detected in the absence of HI antibodies for pandemic H1N1 but not for H3N2 in a natural infection cohort

Amalya Mangiri, P2-495 and P2-615
US CDC Jakarta Office, Indonesia
Did intensified surveillance lead to increased detection of human infections with highly pathogenic avian influenza A(H5N1) virus in East Jakarta, Indonesia?
Physician's knowledge, attitudes, and practices for pandemic, seasonal and avian influenza in Indonesia

Richard Njouom, P2-619
Sanofi Pasteur, Cameroon
Influenza viruses in Cameroon: 5 years of sentinel surveillance data, 2007-2012

Paul Simusika, P2-627
University Teaching Hospital, Zambia
Etiology of severe acute respiratory infections among hospitalized children in Lusaka, Zambia, 2011–2012

Rahul Srivastava, O-885
All India Institute of Medical Sciences, India
Do case definitions affect the prediction of influenza virus in different seasons in north India?

Babasaheb Tandale, P1-131
National Institute of Virology, India
Investigation of human infections during H5N1 crow outbreaks in Jamshedpur, India

Options VIII Information

Options VIII will provide the opportunity for interdisciplinary discussions both within and outside the formal scientific program of the conference. Presentations and session topics have been designed to maximize the opportunities for informal discussions and exchange of ideas between representatives of government agencies, academia, and industry. The conference promotes interactions between basic and applied scientists, public health practitioners, and policy makers interested in mitigating the impact of influenza.

Who Should Attend:

- Physicians
- Scientists
- Clinicians
- Public health specialists
- Researchers
- Epidemiologists
- Vaccine experts
- Health education specialists
- Healthcare policy makers
- Government officials
- Concerned business leaders
- Medical and scientific media

Conference Goals and Objectives:

- Provide comprehensive scientific guidance for all stakeholders involved in influenza prevention, control, and treatment, including seasonal pandemic planning
- Promote genuine international and multidisciplinary collaboration, supporting the full spectrum of influenza research, from basic science to the development of new vaccines and antiviral agents to epidemiology and control programs
- Provide a collegial atmosphere where scientists working in public health and scientists working in agricultural or veterinary agencies can exchange information to develop collaborative approaches to the control and prevention of pandemic influenza
- Maximize opportunities for informal discussions and exchange of ideas between representatives of government agencies, academia, and industry

Registration and Information Desk

The registration and information desk is located on the ground floor level of the Cape Town International Convention Centre.

Registration Hours	
Wednesday, 4 September	08.00-18.00
Thursday, 5 September	08.00-18.00
Friday, 6 September	08.00-18.00
Saturday 7 September	07.00-13.00
Sunday, 8 September	08.00-18.00
Monday, 9 September	08.00-18.00

Welcome Reception

Thursday, 5 September
17.30—19.30

Sponsored by Wesgro/the Cape Town and Western Cape Convention Bureau
Please join us in the Exhibition Hall for a traditional Cape Town Minstrel Parade. Singers, dancers, and musicians dressed in traditional costumes will open the Exhibition Hall in true Cape Town fashion. Face painting, crafts vendors, and a cappella choirs will create a multifaceted welcome celebration that will not be soon forgotten. The *Options VIII* organizers support local organizations; Kwazinto Crafts is a small poverty-alleviation organization that promotes the artworks of disadvantaged craftspeople. Please visit their table in the Exhibition Hall as they display a collection of authentic African craftsmanship for purchase.

Language

English is the official language of *Options VIII*, and all oral presentations will be in English.

Exhibit Hall

Exhibition Hall Hours	
Thursday, 5 September	17.30-19.30
Friday, 6 September	09.00-21.00
Poster Walkabout Session	18.30-21.00
Saturday, 7 September	09.00-12.00
Sunday, 8 September	09.00-21.00
Poster Walkabout Session	17.30-21.00
Monday, 9 September	09.00-16.00

NEW Walkabout Sessions

Options VIII is pleased to present a new feature during the poster receptions, Poster Walkabout Sessions. Scientific Chairs seek to further showcase high-quality abstracts and enhance the prominence of work presented as posters. These sessions will be chaired by experts in the respective fields who will lead groups of interested scientists from poster to poster in each thematic group. Poster authors will have the opportunity to talk briefly about the essence of their work from the poster presentation area. This is an opportunity for young investigators to meet the leaders in the field of influenza in a less formal, more collegial setting. We invite delegates to join us in the poster area at the designated times and take part in the presentation and discussion.

Speaker Ready Room

A Speaker Room will be accessible for speakers to review their presentations in Meeting Room 1.52 located on Level One of the convention centre. Speakers may gain access to the speaker ready room beginning on 4 September 2013 at 09.00. Please note that all slides and presentations must be uploaded prior to the presentation. Under no circumstances will presentations be uploaded in the general session room on the day of the presentation.

Speaker Ready Room Hours	
Wednesday, 4 September	08.00-18.00
Thursday, 5 September	08.00-18.00
Friday, 6 September	08.00-18.00
Saturday, 7 September	08.00-13.00
Sunday, 8 September	08.00-18.00
Monday, 9 September	08.00-18.00

Satellite Symposium

A Satellite Symposium will take place in the Cape Town Convention Center in Ballroom West on Level One on Friday, 6 September 2013 during lunch (13.00-15.00). Boxed lunches will be served. Space is limited and delegates will be seated on a first-come, first-served basis. Sponsored by Sanofi Pasteur.

SANOFI PASTEUR

First Aid Station

A first aid station will be available in the Cape Town International Convention Centre on Level P3 for minor health issues. Please visit the ER 24 Medi Clinic one level down from the registration area.

Currency

Currency exchange services are available at the front desk of the various conference hotels.

Attire

Attire for the conference is business casual. Conference rooms are often cool. *Options VIII* organizers recommend that you bring a light sweater or jacket in case of cool conditions.

Press Office

The *Options VIII* Press Office is located on Level One in Meeting Room 1.53. Delegates with a press badge may use the press office between the hours of 09.00-18.00, 5-9 September, 2013.

Conference Bags

The *Options VIII* conference bags are produced by **Township Patterns**, an independent women's cooperative based in the Townships and Cape Flats of Cape Town. *Options VIII* is proud to work with an organization providing women with the training and business skills required to create independent sewing cooperatives. A unique social enterprise based in Cape Town, Township Patterns is a member of the World Fair Trade Organisation and products are crafted by local township seamstresses. The conference bags are made of 100% African cotton fabric and natural materials. The Organizing and Scientific Committees gratefully acknowledge the *Options VIII* conference bag supporter bioCSL.

Options VIII is committed to supporting local economic development in South Africa. Conference items have been purchased locally whenever possible.

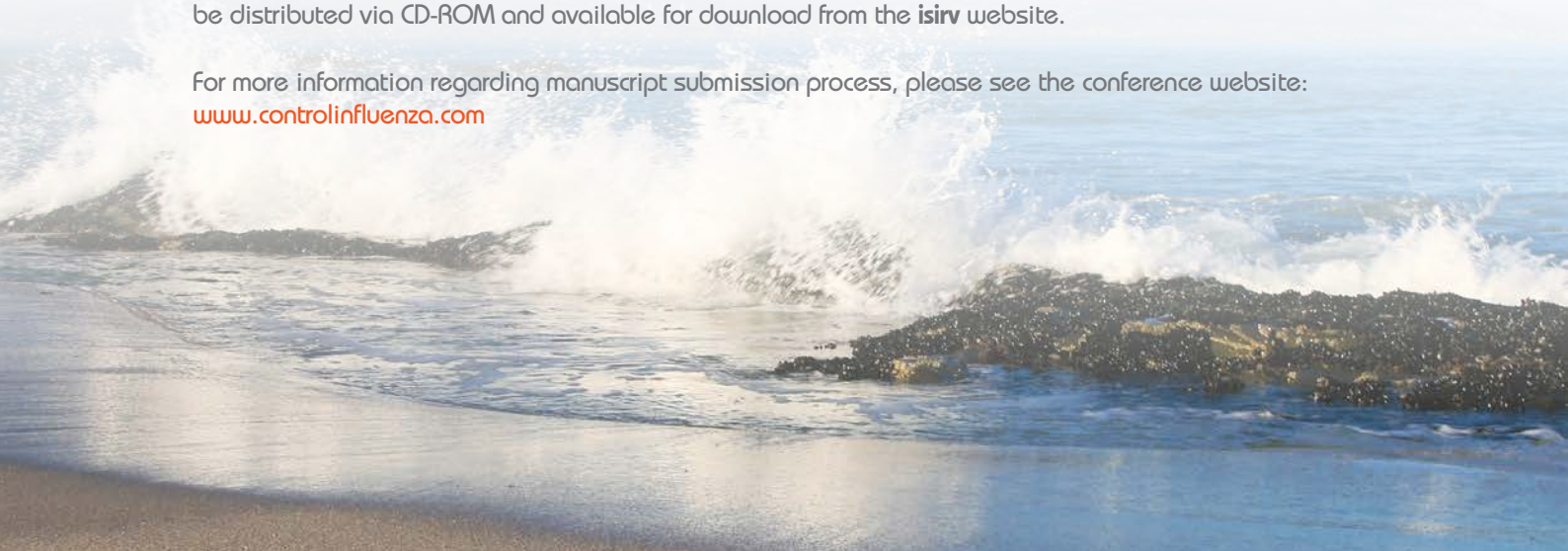
isirv Annual General Meeting

The **isirv** annual general meeting will take place on Saturday, 7 September 2013 at 12.00 in Ballroom East. It will immediately follow the Feature Cornerstone Session and last for approximately 30-45 minutes. Obtain information about the society, meet the existing board members, and be sure to participate in the Board Member Elections. All paid full-conference registrants receive a complimentary 1-year membership to **isirv**, so please stay and discover the benefits of membership. **Make this one of the events that you definitely attend.**

Post-Conference Proceedings

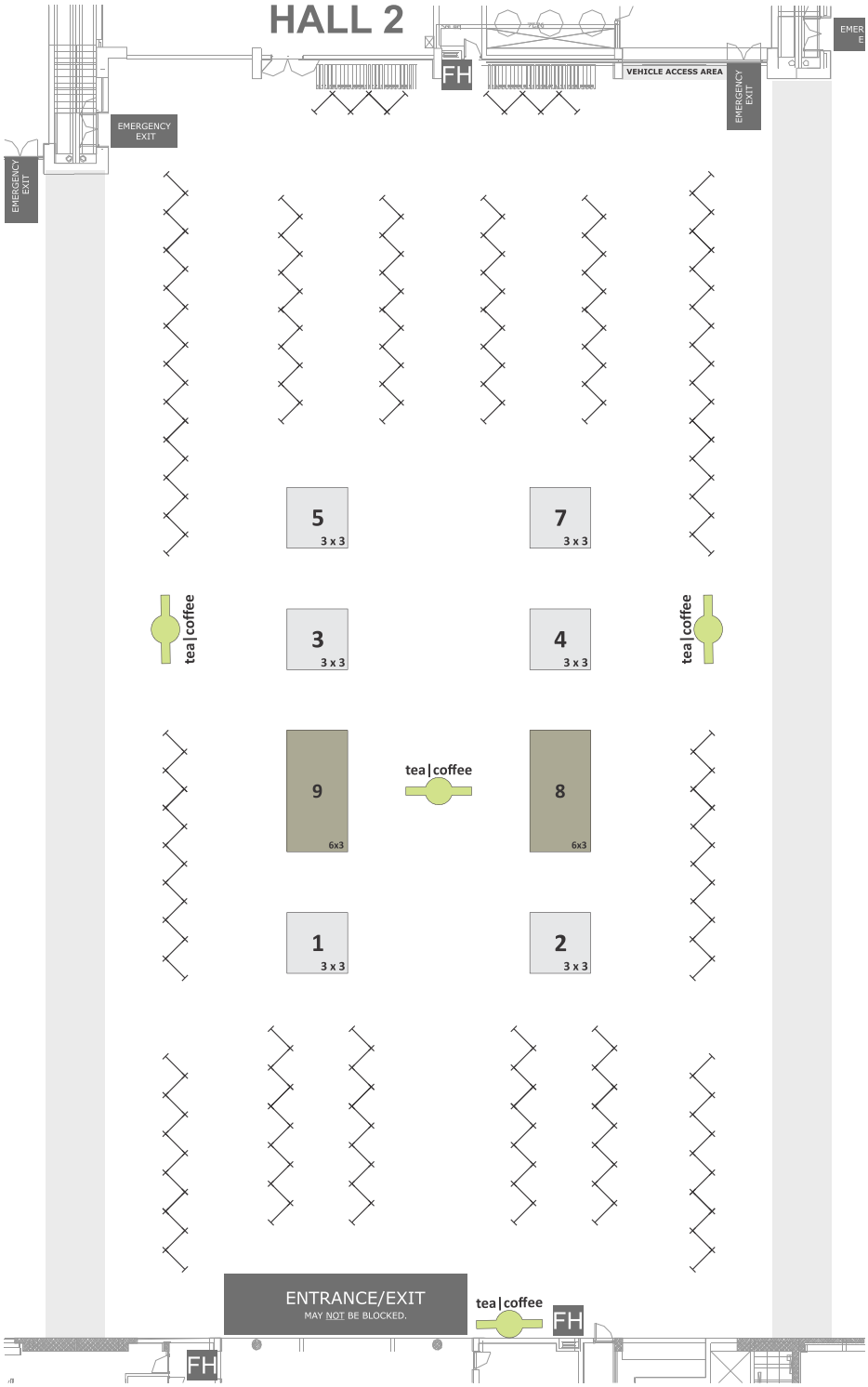
All authors of accepted abstracts are invited to submit optional complete manuscripts for further review by the Scientific Committee for print in the conference proceedings. The *Options VIII* conference proceeding will be distributed via CD-ROM and available for download from the **isirv** website.

For more information regarding manuscript submission process, please see the conference website:
www.controlinfluenza.com



Options VIII Floorplan

1. GISAID Initiative
2. International Society for Influenza and other Respiratory Virus Diseases (**isirv**)
3. European Scientific Working group on Influenza
4. Quidel
5. MESH (Measured Solutions for Health P/L)
7. Longhorn Vaccines
8. Roche
9. Sanofi Pasteur



Options for the Control of Influenza VIII
Cape Town, South Africa • 5-10 September, 2013

Options VIII Programme

	Wed. 04 Sept	Thu. 05 Sept	Fri. 06 Sept
08.00	Registration 08.00-18.00		
09.00-09.40		**Opening Ceremony** *Welcome from Congress and* **isirv** *Chairs* *Wecome: The Honorable Aaron Motsoaledi Minister of Health-South Africa Cape Town, South Africa* *Opening Presentation: Robert Webster, St Jude's Children Research Hospital, Memphis, Tennessee, USA*	**Cross-Cutting Keynote:** **The Interaction between influenza and lung co-pathogens** *Keith Klugman, Department of Global Health at the Rollins School of Public Health at Emory University, Atlanta, Georgia, USA*
09.40-11.00		**Morning plenary session 1—Virology** **vRNP structure and how does the polymerase work** *Speaker: Yoshihiro Kawaoka, University of Wisconsin, School of Veterinary Medicine, Madison, USA* **PA-x and PB1-N40** *Paul Digard, The Roslin Institute, University of Edinburgh, Scottland* **Importins and their role in host restriction of avian influenza viruses** *Gülsah Gabriel, Heinrich-Pette-Institute, Leibniz Institute for Experimental Virology, Hamburg, Germany*	**Morning plenary session 2—Epidemiology** **Maternal Influenza Immunization** *Saad Omer, Emory University, Schools of Public Health and Medicine, Atlanta, Georgia, USA* **Epidemiology of influenza in Africa** *Cheryl Cohen, NICD, Cape Town, South Africa* **Challenges to estimating influenza mortality/severity** *Anthony Mounts, Global Influenza Programme, Health Security & Environment Cluster, World Health Organization, Geneva, Switzerland*
11.00-11.30		Morning networking and refreshment	Morning networking and refreshment
11.30-13.00		**Mid-day plenary session 1—Pathogenesis** **Lung injury / ARDS** *Malik Peiris, University of Hong Kong, Hong Kong, SAR, China* **Overview of pathogenesis and transmission of swine influenza** *Juergan Richt, Kansas State University, College of Veterinary Medicine, Manhattan, Kansas, USA* **Experimental studies of influenza virus transmission in humans** *Speaker: Jonathan Van Tam, Health Protection & Influenza Research Group, Epidemiology and Public Health, University of Nottingham, Nottingham, United Kingdom*	**Mid-day plenary session 2—mmunology** **Mx Restriction of influenza viruses** *Otto Haller, University Hospital Freiburg, Freiburg, Germany* **T cells in the respiratory tract** *Thomas Braciale, University of Virginia, Charlottesville, Virginia, USA* **B cells and influenza** *Paul G. Thomas, Department of Immunology, St. Jude Children's Research Hospital, Memphis, Tennessee, USA*
13.00-14.00		Lunch - on own	13.00-15.00 Lunch - **Satellite Symposium** **Four Questions about Influenza Immunization, Sponsored by Sanofi Pasteur**
14.00-15.30		**Concurrent afternoon workshops** **1A: News and Views from the H7N9 Outbreak** State of the Art Presentation: H7N9 **1B: Epidemiology I** **1C: Policy and Risk Communication**	15.00-16.30 **Concurrent afternoon workshops** **3A: Evolution, Systems Biology & Genomics** **3B: Antiviral Drugs and Resistance** **3C: Disease Burden and Health Economics**
15.30-16.00		Afternoon networking and refreshment	16.30 – 17.00 Afternoon networking and refreshment
16.00-17.30		**Concurrent evening workshops** **2A: Virology and Viral Receptors** **2B: Epidemiology II** **2C: Models informing Public Health and Pandemic Mitigation**	17.00 – 18.30 **Concurrent evening workshops** **4A – Innate and Adaptive Immunity** **4B – Vaccines I** **4C – Transmission and Infection Control**
17.30-19.30		**Welcome reception** *(Options VIII exhibition hall 2)*	18.30-21.00 **Poster Reception** *Walkabout session #1* *(Options VIII exhibition hall 2)*

Options VIII Programme

Sat. 07 Sept

Feature Cornerstone Session: Animal-Human Interface

Mammalian adaptation of influenza viruses: what we know and what we don't
Terrence Tumpey, Immunology and Pathogenesis Branch, Influenza Division, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Ecology, evolution, and human health risks from emerging swine influenza viruses
Richard Webby, Infectious Diseases, St Jude Children's Research Hospital, Memphis, Tennessee, USA

Risk assessing animal viruses for pandemic threat
Nancy Cox, WHO Collaborating Center for Surveillance Epidemiology and Control of Influenza, National Center for Immunization and Respiratory Diseases, Coordinating Center for Infectious Disease, Influenza Division, Centers for Disease Control and Prevention, Atlanta, Georgia, USA

Human H5N1 and H7N9 Disease or Human Disease with Avian Viruses (H5, H7, H9, even H6)
Peter Horby, Oxford University Clinical Research Unit, - Wellcome Trust Major Overseas Programme, Hanoi, Vietnam; Singapore Infectious Diseases Initiative, Singapore

The pros and cons of GOF studies
- *Yoshihiro Kawaoka*
- *Charles Russell*
- *Adolfo García-Sastre*
- *Michael Osterholm*
- *Marc Lipsitch*
- *Jessica Bloom*

Scholarship awards ceremony

12.00-13.00

isirv annual general meeting (AGM)

Sun. 08 Sept

Cross-Cutting Keynote:
Universal epitopes, their application to vaccines and therapy and importance in influenza epidemiology
Speaker: Peter Palese, Icahn School of Medicine at Mount Sinai, New York, New York, USA

Morning plenary session 3—Diagnostics

Real-time PCR
Stephen Lindstrom, National Center for Immunization for Respiratory Diseases, CDC, Atlanta, Georgia, USA

Influenza whole genome analysis and its role in diagnostics, patient care and public health
Monica Galiano, Health Protection Agency, London, United Kingdom

Clinical relevance of influenza viral load measurement
Nelson Lee, Stanley Ho Center for Emerging Infectious Diseases, The Chinese University of Hong Kong, Hong Kong, SAR, China

Morning networking and refreshment

Mid-day plenary session 3—Clinical

Brave and ISARIC: New Paradigms for responding to global respiratory threats
Nahoko Shindo, World Health Organization, Geneva, Switzerland

Influenza and pregnancy
Shigeru Saito, Department of Obstetrics and Gynecology, Graduate School of Medicine and Pharmaceutical Science for Research, University of Toyama, Toyama Prefecture, Japan

The many faces of influenza
Fred Hayden, University of Virginia, School of Medicine, Charlottesville, Virginia, USA

Lunch - on own

Concurrent afternoon workshops

5A: Animal-Human Interface

5B: Vaccines II

5C: Diagnostics

Afternoon networking and refreshment

Concurrent evening workshops

6A: Animal Influenza and Models

6B: Surveillance I

6C: Clinical Management

Poster Reception
Walkabout session #2
(Options VIII exhibition hall 2)

Mon. 09 Sept

Cross-Cutting Keynote:
Host genetics of human influenza
Paul Kellam, Wellcome Trust Sanger Institute, Hinxton, Cambridge, United Kingdom

Morning plenary session 4—Therapeutic Interventions

Overview of existing therapies/clinical experience with neuraminidase inhibitors
Michael Ison, Northwestern University, Evanston, Illinois, USA

Overview of the role of immunmodulation, cellular factors and proteases
Béatrice Riteau, Faculte de Medecine de Laennec, Unité VirPathFrance Lyon, France

Polymerase inhibitors
Martin Schwemmle, University Hospital Freiburg, Freiburg, Germany

Morning networking and refreshment

Mid-day plenary session 4—Vaccines

Overview of vaccine effectiveness issues and controversies
Alain Moren, EpiConcept, Paris France

Next generation of influenza vaccines
Rick Bright, HHS/OS/ASPRA BARDA, Washington, District of Columbia, USA

Clinical aspects in the development and licensing of the Russian-based live attenuated influenza vaccines for pandemic influenza preparedness in developing countries
Larisa Rudenko, Institute of Experimental Medicine of the NorthWest Branch of the Russian Academy of Medical Sciences, St Petersburg, Russia

Lunch - on own

Concurrent afternoon workshops

7A: Late Breaking Abstracts

7B: Surveillance II

7C: Novel Therapeutics

Afternoon networking and refreshment

Closing plenary session
Public Health

Usefulness of modeling for decision making on influenza
Guy Walker Department of Health, London, United Kingdom

Non-pharmaceutical interventions-effectiveness and consequences
Benjamin Cowling, University of Hong Kong, Hong Kong, SAR, China

Update on global vaccine policy
Marie-Paule Kieny, World Health Organization, Geneva, Switzerland

Badge Policies

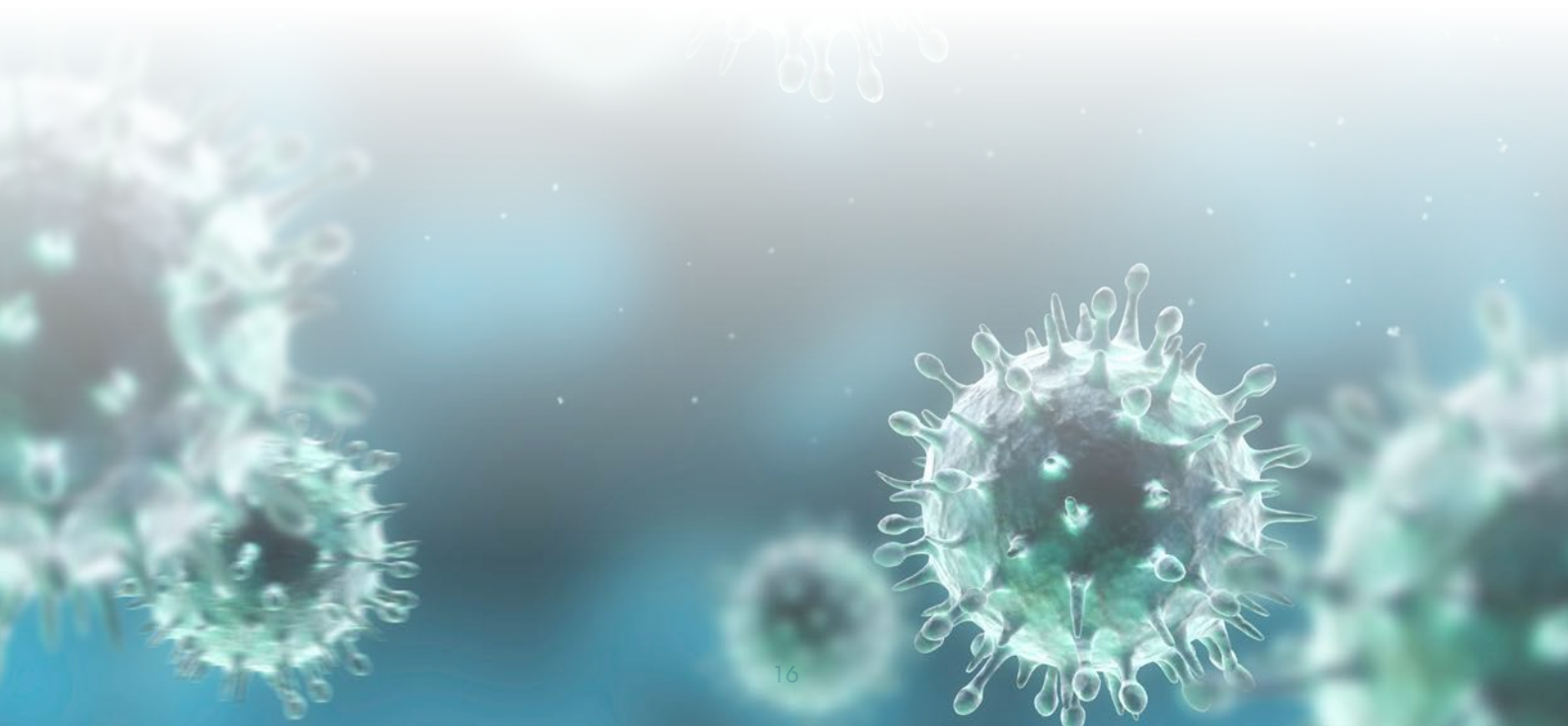
Full Conference Badge
A Full Conference badge permits access to all the cross-cutting keynote lectures, plenary sessions, scientific breakout sessions, and the exhibit hall. Delegates with a Full Conference badge will receive a conference bag, conference program, and abstract USB. A Full Conference badge does not guarantee a seat in the breakout sessions. Breakout rooms are assigned in advance of the conference. The safety of Options VIII delegates is always a primary concern, and may require closing a room if attendance exceeds the room capacity. We encourage early arrival to the sessions to help ensure that a seat is available.

One-Day Pass
The One-Day Pass conference badge is valid for one (1) day only. A One-Day Pass conference badge permits access to all the cross-cutting keynote lectures, plenary sessions, scientific breakout sessions, and the exhibit hall functions for 1 day. Delegates with a One-Day Pass conference badge will receive a conference bag and a conference program, but will not receive an abstract USB. A One-Day Pass conference badge does not guarantee a seat in the breakout sessions. Breakout rooms are assigned in advance of the conference. The safety of the Options VIII delegates is always a primary concern, and may require closing a room if attendance exceeds the room capacity. We encourage early arrival to the sessions to help ensure that a seat is available.

Accompanying Guest Badge
Delegates with an Accompanying Guest badge are eligible to attend all social events that take place in the exhibits hall (coffee breaks, welcome reception and poster sessions). Accompanying guests will not be permitted to attend the cross-cutting keynote lectures, plenary sessions, or any of the scientific breakout sessions. Delegates with an Accompanying Guest badge will not receive a conference bag, conference program, or abstract USB

Student Badge
Student Badges may be requested by an undergraduate or graduate student. Student Badges permit access to the cross-cutting keynote lectures, plenary sessions, and the exhibit hall. Delegates with a Student Badge will receive a conference bag, conference program, and abstract book.

Press Badge
The Options for the Control of Influenza VIII conference would like to welcome the press to Cape Town! Press Badges will permit members of the press access to all of the cross-cutting keynote lectures, plenary sessions, and the exhibit hall. Press Badges will not allow access to the scientific breakout sessions. Delegates with a Press Badge will receive a conference bag and conference program, but will not receive an abstract USB



Scientific Abstract Poster Presentations

We are pleased to highlight over 700 abstract presentations at the *Options VIII* conference. Accepted posters are on display at the Cape Town International Convention Centre in the Exhibition Hall 2, Level Zero. Delegates are invited to review and study posters throughout the day and especially during the allotted poster receptions. Due to the number of abstracts received, posters will be divided into 2 groups, with each group displayed for a 2-day period. Please see the group information below regarding dates, times, and categories.

Group I

Poster mounting:	Wednesday, 4 September	09.00 – 14.00
	Thursday, 5 September	09.00 – 11.00
Display dates:	Thursday, 5 September	17.30 – 19.30
	Friday, 6 September	09.00 – 18.30
Poster reception:	Friday, 6 September	18.30 – 21.00
Poster removal:	Saturday, 7 September	11.30 – 13.30

Poster Categories

P1-100 – P1 118	News and Views from H7N9 Outbreak
P1-119 – P1-154	Epidemiology I
P1-155 – P1-166	Policy and Risk Communication
P1-167 – P1-184	Virology and Viral Receptors
P1-185 – P1-208	Models Informing Public Health and Pandemic Mitigation
P1-209 – P1-253	Evolution, Systems Biology, and Pathogenesis
P1-254 – P1-292	Antiviral Drugs and Resistance
P1-293 – P1-336	Disease Burden and Health Economics
P1-337 – P1-366	Innate and Adaptive Immunity
P1-367 – P1-414	Vaccines I
P1-415 – P1-434	Transmission and Infection Control

Group II

Poster mounting:	Saturday, 7 September	14.00 – 17.00
Display dates:	Sunday, 8 September	09.00 – 17.30
	Monday, 9 September	09.00 – 17.30
Poster reception:	Sunday, 8 September	17.30 – 21.00
Poster removal:	Tuesday, 10 September	10.00 – 12.00

Poster Categories

P2-435 – P2-465	Epidemiology II
P2-466 – P2-497	Animal Human Interface
P2-498 – P2-549	Vaccines II
P2-550 – P2-570	Diagnostics
P2-571 – P2-603	Animal Influenza and Models
P2-604 – P2-615	Clinical Management
P2-616 – P2-694	Surveillance
P2-695 – P2-714	Novel Therapeutics
LBA-P2-007 – LBA-P2-075	Late-Breaking Abstracts

We thank you for your adherence to this schedule in order to ensure that everyone's poster board is available for poster presentation. Posters not removed per this schedule will be removed by organizers and discarded.

NEW Walkabout Sessions

The *Options VIII* Scientific Chairs are pleased to highlight scientific excellence through Poster Walkabout Sessions during the poster receptions. Selected abstracts will be presented to the audience from the poster presentation area. Delegates are invited to join the tour of selected posters and discuss topics of interest. This is an opportunity to meet the leaders in the field of influenza who will facilitate the walkabouts.

SATELLITE SYMPOSIUM

Four Questions about Influenza Immunization

OPTIONS VIII CONFERENCE
CAPE TOWN - SOUTH AFRICA

Friday, September 6, 2013 - 1:00pm to 3:00pm

Lunch boxes will be served

CHAIR — THOMAS D. SZUCS
CO-CHAIR — FREDERICK R. VOGEL

How does influenza vaccination benefit the public health?
David S. Fedson, MD
Sergy Haut, France

What are key drivers that could improve influenza vaccination coverage rates in the general population?
Thomas D. Szucs, MD, MPH, LLM
Institute of Social and Preventive Medicine, University of Zurich - Switzerland

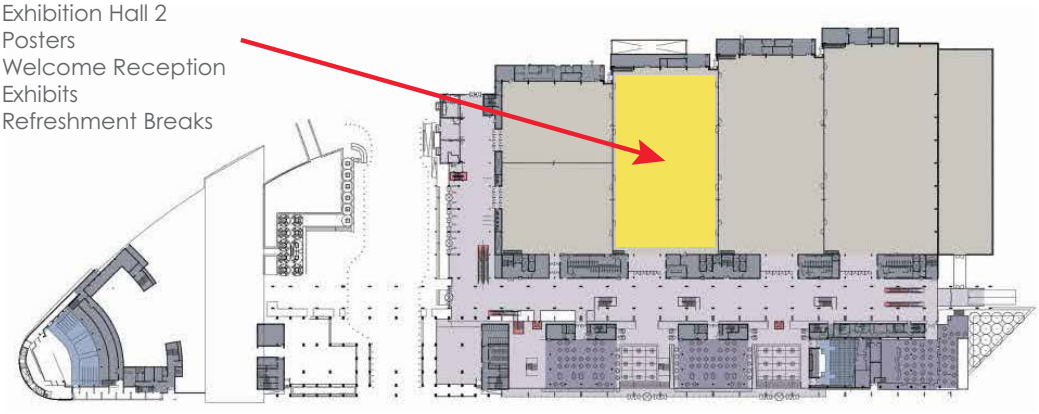
What are the roles and responsibilities of healthcare workers in influenza prevention?
George Kassianos, MD (Hons), FRCGP, FESC, DRCOG, LRCP (Edin.), LRCS (Edin.), LRCP&S (Glasgow), DMedAcup., DMedHypn., DFP, FFTM RCPS (Glasgow)
Ringmead Medical Practice, Bracknell, Berkshire, England

How can we improve influenza vaccines?
Vanessa Escuret-Poncin, PD, PhD
Virology Department, National Influenza Reference Centre, Lyon, France

SANOFI PASTEUR

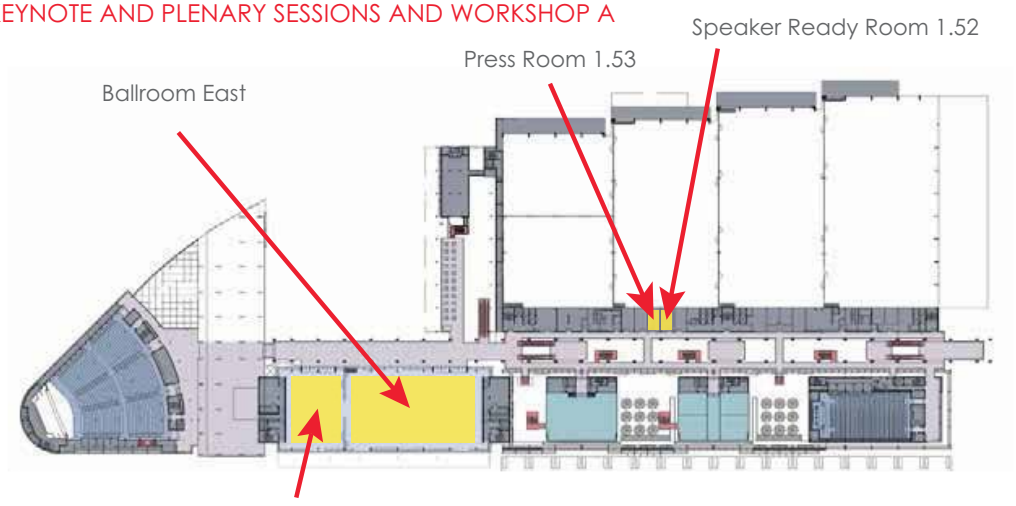
Cape Town International Convention Center Map

EXHIBITION



LEVEL 0

KEYNOTE AND PLENARY SESSIONS AND WORKSHOP A



LEVEL 1

WORKSHOPS B AND C

LEVEL 2

Options for the Control of Influenza VIII
Cape Town, South Africa • 5-10 September 2013

Agenda

Wednesday, 4 September 2013

08.00-18.00 — Registration
Exhibition Hall 2 Foyer (Level Zero)

Thursday, 5 September 2013

09.00-09.40 — **Opening Ceremony**
Ballroom East (Level One)

Welcome from Congress and isirv Chair

Welcome from Cape Town Minister of Health
The Honorable Aaron Motsoaledi, Minister of Health-South Africa, Cape Town, South Africa

My search for Pandemic Influenza
Robert Webster, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

09.40-11.00 — **Morning Plenary Session 1—Virology**
Ballroom East (Level One)

Chair: Wendy Barclay, Imperial College London, London, United Kingdom

vRNP Structure and How Does the Polymerase Work
Yoshihiro Kawaoka, University of Wisconsin Madison, School of Veterinary Medicine, Madison, Wisconsin, United States of America

PA-x and PB1-N40
Paul Digard, The Roslin Institute, University of Edinburgh, Scotland

Importins and Their Role in Host Restriction of Avian Influenza viruses
Gülsah Gabriel, Heinrich-Pette-Institute, Leibniz Institute for Experimental Virology, Hamburg, Germany

11.00-11.30 — Morning Networking and Refreshment
Exhibition Hall 2 (Level Zero)

11.30-13.00 — **Mid-Day Plenary Session 1—Pathogenesis**
Ballroom East (Level One)

Chair: Stacey Schultz-Cherry, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Lung Injury/ARDS
Malik Peiris, Department of Microbiology and HKU-Pasteur Research Centre,The University of Hong Kong, Hong Kong SAR, China

Overview on Pathogenesis and Transmission of Swine Influenza
Juergen Richt, Kansas State University, College of Veterinary Medicine, Manhattan, Kansas, United States of America

Experimental Studies of Influenza Virus Transmission in Humans
Jonathan Van Tam, Health Protection and Influenza Research Group, Epidemiology and Public Health, University of Nottingham, Nottingham, United Kingdom

13.00-14.00 Lunch—on own

14.00-15.30

Concurrent Afternoon Workshops—A

Workshop 1A: News and Views From the H7N9 Outbreak
Ballroom East (Level One)

Chairs: Yi Guan, University of Hong Kong, State Key Laboratory of Emerging Infectious Diseases, Hong Kong SAR, China
Debby van Riel, Erasmus University Medical Centre, Rotterdam, The Netherlands

State-of-the-Art Presentation: H7N9 Outbreak
Yi Guan, University of Hong Kong, State Key Laboratory of Emerging Infectious Diseases, Hong Kong SAR, China

Oral Presentations:

O-800 Comparative epidemiology of human infections with avian influenza A(H7N9) and A(H5N1) viruses in China. Benjamin Cowling

O-801 Mammalian adaptation markers in avian-origin H7N9 virus, a comprehensive investigation in isolates and clinical specimens from the H7N9 influenza affected area. Honglin Chen

O-802 Pathogenesis and transmission of H7N9 influenza virus in poultry. Mary Pantin-Jackwood

O-803 Lessons learned from the first case of H7N9 in Taiwan and public health implication from integrated surveillance from animals to humans. Chwan-Chuen King

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Workshop 1B: Epidemiology I
Meeting Room 2.40 (Level Two)

Chairs: Aubree Gordon, School of Public Health, University of California, Berkley, California, United States of America
Ghazi Kayali, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Oral Presentations:

O-804 The role of HIV in the household introduction and transmission of influenza in an urban setting, Nairobi, Kenya, 2008-2011. Gideon Emukule

O-805 Risk factors for severe acute respiratory infection (SARI) and influenza hospitalisation in New Zealand. Michael Baker

O-806 Pandemic H1N1 virus transmission and shedding dynamics in houses of index cases detected by active surveillance: the Ha Nam cohort. Annette Fox

O-807 Severe influenza-associated lower respiratory tract infection in a high HIV-prevalence setting-South Africa, 2009-2011. Sibongile Walaza

O-808 Variation in burden of influenza-associated hospitalization between two rural communities in India: results of a population-based study, 2010-2012. Shobha Broor

O-809 Environmental correlates of H5N2 low pathogenicity avian influenza (LPAI) outbreak heterogeneity in domestic poultry in Italy, 2010-2012. Lapo Mughini-Gras

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Workshop 1C: Policy and Risk Communication
Meeting Room 2.60 (Level Two)

Chairs:

Michael Osterholm, Center for Infectious Disease Research and Policy, University of Minnesota, Minneapolis, Minnesota, United States of America
Doudou Diop, Institut de Recherche pour le Développement, Dakar, Senegal

Oral Presentations:

O-810 Influenza vaccines and influenza antiviral drugs in Africa: are they available and do guidelines for their use exist? Adam Cohen

O-811 Rapid knowledge translation during the 2009 influenza pandemic Joel Kettner

O-812 Communicating influenza antivirals' stockpiling strategies across Europe: a quantitative and qualitative study. Frederic Bouder

O-813 Where backyard poultry producers seek help for sick poultry: implications for avian influenza prevention in Bangladesh. Nadia Rimi

O-814 The World Health Organization battle against respiratory viruses (BRaVe) initiative: bridge science and policy to foster innovative therapies to tackle respiratory viral infections. Nahoko Shindo

O-815 Herald 1918 pandemic waves: importance for contemporary pandemic response strategies. Wladimir Alonso

15.30-16.00 Afternoon Networking and Refreshment
Exhibition Hall 2 (Level Zero)

16.00-17.30

Concurrent Evening Workshops—B

Workshop 2A: Virology and Viral Receptors
Ballroom West (Level One)

Chairs:

Leo Poon, Centre of Influenza Research and School of Public Health, the University of Hong Kong, Hong Kong SAR, China
Husni Elbahesh, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Oral Presentations:

O-816 Focal adhesion kinase (FAK) regulates efficient influenza A virus entry and RNA replication. Husni Elbahesh

O-817 Airborne transmission in ferrets is associated with a change in glycan receptor specificity of an a 2, 3 sialic acid-specific 2009 pandemic influenza A virus. Kanta Subbarao

O-818 The cell-surface mucin MUC1 is a potential receptor for influenza A virus infection. Julie McAuley

O-819 Properties and prevalence of neuraminidases of human H3N2 influenza viruses that bind sialic acid via their catalytic site. Steve Wharton

O-820 Host-specific differences in membrane fusion activity of H1N1 influenza A viruses. Jan Baumann

O-821 A statistical strategy to identify recombinant viral ribonucleoprotein of avian, human, and swine influenza A viruses with elevated polymerase activity. Leo Poon

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Workshop 2B: Epidemiology II
Meeting Room 2.40 (Level Two)

Chairs:

Ben Cowling, School of Public Health, Li Ka Shing Faculty of Medicine, the University of Hong Kong, Hong Kong SAR, China
Saranya Sridhar, National Heart and Lung Institute, Imperial College London, Norfolk Place, London, United Kingdom

Oral Presentations:

O-822 The dynamics of pandemic and seasonal influenza viral shedding and clinical illness in naturally acquired infections. Benjamin Cowling

O-823 Divergent patterns of circulating influenza viruses in two regions of Northern India: when does equator not define hemisphere? Parvaiz Koul

O-824 Higher incidence of pandemic influenza natural infection in the third wave compared with the second wave in an adult community cohort in the UK. Saranya Sridhar

O-825 Comparative incidence and severity of infection with currently endemic human influenza A viruses: a longitudinal study. Steven Riley

O-826 Evolution of an influenza pandemic in 13 countries on 5 continents monitored by protein microarray from neonatal screening bloodspots. Adam Meijer

O-827 Influenza seasonality in Madagascar: the mysterious African free-runner. Wladimir Alonso

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Workshop 2C: Models Informing Public Health and Pandemic Mitigation
Meeting Room 2.60 (Level Two)

Chairs:

John Watson, Health Protection Agency, London, United Kingdom
Amber Smith, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Oral Presentations:

O-828 Pandemic influenza mortality in developing countries is dramatically reduced by targeting interventions to those with endemic diseases. George Milne

O-829 The social resolution of influenza transmission in a human population. Adam Kucharski

O-830 Origins of the basic reproduction number, R0, and its value in influenza research. John Watkins

O-831 The first few hundred—case and contact series investigations—experiences from the United Kingdom. Nicki Boddington

	O-832	Immunogenicity, effectiveness, and population impact of influenza vaccine in England during seasonal and pandemic periods. Andrew Hayward
	O-833	Influenza A Virus co-infection kinetics: gaining insight into pathogenesis through mathematical models. Amber Smith
17.30-19.30		**Welcome Reception** Exhibition Hall 2 (Level Zero) Sponsored by Wesgro/Cape Town and Western Cape Convention Bureau Please join us in the exhibition hall for a traditional Cape Town Minstrel Parade. Singers, dancers, and musicians dressed in traditional costumes will open the exhibition hall in true Cape Town fashion. Face painting, crafts vendors, and a cappella choirs will create a multifaceted welcome celebration that will not be soon forgotten.

Friday, 6 September 2013

09.00-09.40	**Cross-Cutting Keynote** Ballroom East (Level Zero) **The Interaction Between Influenza and Lung Co-Pathogens** *Keith Klugman, Gates Foundation, Seattle, Washington, United States of America*
09.40-11.00	**Morning Plenary Session 2—Epidemiology** Ballroom East (Level Zero)
Chair:	Gavin Smith, Program of Emerging Infectious Diseases, Duke-NUS Graduate Medical School, Singapore
	Maternal Influenza Immunization *Saad Omer, Emory University, Schools of Public Health and Medicine, Atlanta, Georgia, United States of America* **Epidemiology of Influenza in Africa** *Cheryl Cohen, NICD, Cape Town, South Africa* **Challenges to Estimating Influenza Mortality/Severity** *Anthony Mounts, Global Influenza Programme, Health Security and Environment Cluster, World Health Organization, Geneva, Switzerland*
11.00-11.30	**Morning networking and refreshment** Exhibition Hall 2 (Level Zero)
11.30-13.00	**Mid-Day Plenary Session 2—Immunology** Ballroom East (Level One)
Chair:	Jackie Katz, National Center for Immunization and Respiratory Disease Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America
	Mx Restriction of Influenza Viruses *Otto Haller, University Hospital Freiburg, Freiburg, Germany*

T Cells in the Respiratory Tract
Thomas Braciale, University of Virginia, Charlottesville, Virginia, United States of America

B Cells and Influenza
Paul G. Thomas, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

13.00-15.00 Sanofi Symposium: Four Questions About Influenza Immunization
Ballroom West (Level One)
Box lunch served

13.00-15.00 Lunch—on own

15.00-16.30

Concurrent Afternoon Workshops—C

Workshop 3A: Evolution, Systems Biology, and Genomics
Ballroom East (Level One)

Chairs: Gillian Air, University of Oklahoma Health Sciences Center, Department of Biochemistry and Molecular Biology, Oklahoma City, Oklahoma, United States of America,
Erik Karlsson, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Oral Presentations:

O-834 Selection on hemagglutinin imposes a genetic bottleneck during mammalian transmission of H5N1 influenza viruses. Thomas Friedrich

O-835 A systems biology approach reveals novel host response genes that differentially regulate influenza virus pathogenicity. Amie Eisfeld

O-836 The importin-α7 gene is a determinant of influenza virus cell tropism in the murine lung. Patricia Resa Infante

O-837 Antigenic and receptor-binding properties of recent human H3N2 viruses. Gillian Air

O-838 The obese host as a driver of influenza virus evolution. Erik Karlsson

O-839 Increased expression of β6 integrin is associated with enhanced inflammation and lung damage during influenza infection. Victoria Meliopoulos

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Workshop 3B: Antiviral Drugs and Resistance
Meeting Room 2.40 (Level Two)

Chairs: Elena Govorkova, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America
Hui-Ling Yen, Li Ka Shing Faculty of Medicine, School of Public Health, University of Hong Kong, Hong Kong SAR, China

Oral Presentations:

O-840 Mechanism-based covalent inhibitors of influenza virus neuraminidases demonstrate broad spectrum antiviral efficacy in vitro and in vivo. Jennifer McKimm-Breschkin

O-841 A novel I221L substitution in neuraminidase confers high level resistance to oseltamivir in clinical influenza B virus isolates. Bruno Lina

O-842 Characterization of the R292K neuraminidase mutation that confers resistance to the neuraminidase inhibitors in a novel H7N9 human isolate. Hui-Ling Yen

O-843 Neuraminidase inhibitor oseltamivir protects mice against lethal A/Anhui/1/2013 (H7N9) influenza virus infection. Elena Govorkova

O-844 The compensatory role of non-neuraminidase mutations in replication or transmission of oseltamivir-resistant influenza virus. Angie Lackenby

O-845 Drug susceptibility of zoonotic influenza viruses associated with outbreaks in humans: 2011-2013. Larisa Gubareva

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Workshop 3C: Disease Burden and Health Economics
Meeting Room 2.60 (Level Two)

Chairs: Neil Cameron, Stellenbosch University, Stellenbosch, South Africa
Ellen Fragaszy, University College London, London, United Kingdom

Oral Presentations:

O-846 Routine PCR testing of respiratory samples from coronial autopsies increases the recognition of influenza and other respiratory viruses as causes of death. David Smith

O-847 The burden of influenza and RSV among inpatients and outpatients in rural western Kenya, 2009-2012. Gideon Emukule

O-848 Mortality associated with influenza and respiratory syncytial virus among children less than 5 years of age in a high HIV-prevalence setting—South Africa, 1998-2009. Stefano Tempia

O-849 Monitoring mortality for public health action in Europe, EuroMOMO: an important tool for influenza surveillance and impact assessment. Anne Mazick

O-850 Case fatality risk in the UK during the first two waves of the 2009 H1N1 pandemic—results from the Flu Watch Study. Ellen Fragaszy

O-851 Increased risk of swine influenza in pig industry workers compared with the general population in the UK. Andrew Hayward

16.30-17.00 **Afternoon Networking and Refreshment**
Exhibition Hall 2 (Level Zero)

17.00-18.30 ## Concurrent Evening Workshops—D

Workshop 4A: Innate and Adaptive Immunity
Ballroom West (Level One)

Chairs: Anne Kelso, WHO Collaborating Centre for Reference and Research on Influenza, Victoria, Australia,
Carolien van de Sandt, Erasmus MC, Department of Viroscience, Rotterdam, The Netherlands

Oral Presentations:

O-852 A potent cytotoxic T-cell epitope in the extracellular domain of influenza B virus NB promotes virus clearance. Xavier Saelens

O-853 Human cytotoxic T-lymphocytes directed to seasonal influenza A viruses cross-react with the newly emerging H7N9 virus. Carolien van de Sandt

O-854 Induction of broadly neutralizing influenza virus group 2 HA antibodies through natural infection and novel vaccination strategies. Irina Margine

O-855 Type I interferon antagonistic properties of IAV polymerase proteins determine pathogenicity. Swantje Liedmann

O-856 Protection against influenza infection was associated with neutralizing antibodies detected in the absence of HI antibodies for pandemic H1N1 but not for H3N2 in a natural infection cohort. Hoa Le

O-857 Inhibition of cellular p38 MAP kinase impairs influenza virus induced primary and secondary host gene responses thereby protecting mice from lethal H5N1 infection. Stephan Ludwig

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Workshop 4B: Vaccines I

Meeting Room 2.40 (Level Two)

Chair: Peter Palese, Mount Sinai School of Medicine, New York, New York, United States of America,
Kristin G-I Mohn, University of Bergen, Bergen, Norway

Oral Presentations:

O-858 Effectiveness of seasonal trivalent influenza vaccine for preventing influenza virus illness among pregnant women: a population-based case-control study during the 2010-2011 and 2011-2012 influenza seasons. Mark Thompson

O-859 Pandemic live attenuated influenza vaccines prime for a long lasting immune response. Catherine Luke

O-860 Effectiveness of seasonal influenza vaccination of children in tropical developing Africa: a cluster-randomized trial. John Victor

O-861 Trivalent inactivated influenza vaccine immunogenicity in HIV-infected pregnant women and transplacental antibody transfer. Marta Nunes

O-862 A study of the local and systemic immune responses after intranasal influenza vaccination in children. Kristin G-I Mohn

O-863 Effectiveness of 2011/12 seasonal influenza vaccines in the prevention of influenza-related hospitalization in Canadian adults: a Public Health Agency of Canada/Canadian Institutes of Health Research (PCIRN) Serious Outcomes Surveillance Network study. Shelly McNeil

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Workshop 4C: Transmission and Infection Control

Meeting Room 2.60 (Level Two)

Chairs: Randy Albrecht, Icahn School of Medicine at Mount Sinai, Department of Microbiology, New York, New York, United States of America
Sun-Woo Yoon, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Oral Presentations:

O-864	Biosafety and biosecurity in a biocontainment laboratory working with highly pathogenic avian influenza (HPAI). Lisa Kercher
O-865	Utilizing endogenous microRNA to confer molecular biocontainment to gain-of-function influenza viruses: towards risk mitigation. Randy Albrecht
O-866	Limited airborne transmission of influenza A/H7N9 virus between ferrets. Eefje Schrauwen
O-867	Transmission bottlenecks in the ferret model differ between respiratory droplet and contact transmission routes. Wendy Barclay
O-868	Efficacy of surgical face masks in reducing influenza virus dissemination in human exhaled breath. Nancy Leung
O-869	Household transmission of influenza in Nicaragua. Aubree Gordon

18.30-21.00

Poster Reception—Group I

Exhibition Hall 2 (Level Zero)

Walkabout Poster Session I
Starting at poster P1-115

18.30-19.15 Virology

Host: Paul Digard, The Roslin Institute, University of Edinburgh, Scotland

Posters:

P1-115	Novel avian-origin influenza A (H7N9) virus attaches to epithelium in both upper and lower respiratory tract of humans. Debby van Riel
P1-176	HemaggluStinin receptor specificity and structural analyses of aerosol transmissible H5N1 viruses. Robert De Vries
P1-182	Solving the complexities of influenza A virus infection of macrophages: macrophage galactose-type lectin (MGL) can mediate virus attachment and entry. Sarah Londrigan
P1-252	Genetic analysis of low pathogenic avian influenza H4N6 and H9N2 viruses circulating in West Bengal, India reveals genetic diversity. Jayati Mullick
P1-253	Generation and characterization of influenza A viruses with altered mutational frequencies. Peter Cheung
P1-290	Resistance mutation R292K in A(H6N2) is induced by low levels of oseltamivir exposure of infected mallards. Anna Gillman
P1-291	Recent A(H1N1)pdm09 influenza viruses encode permissive NA mutations which improve the fitness of oseltamivir-resistant H275Y variants. Aeron Hurt
P1-350	The role of antigen presenting cells induced by influenza and pneumococcal coinfections: an in vitro model. Jonathan Hoffmann
P1-432	Role of a hemagglutinin residue in the emergence of the 2009 H1N1 pandemic influenza vSirus. Sun-Woo Yoon

19.15-20.00 Epidemiology

Host: Keith Klugman, Gates Foundation, Seattle, Washington, United States of America

Posters:

P1-116 Mild to moderate influenza A(H7N9) infections detected through China's National Influenza-Like-Illness Sentinel Surveillance System. Dennis Ip

P1-152 Influenza-associated severe acute respiratory illness deaths in the WHO African Region: a case-series from 8 countries. Meredith McMorrow

P1-153 Development of an on-line, real-time information retrieval system for influenza surveillance data collection and sharing in Mongolia. Pagbajab Nymadawa

P1-207 Anydemic, a new kind of real-time stochastic model for decision-making: feasibility study. Jean Marie Cohen

P1-208 Assessing outbreak containment success in case of accidental laboratory escape of potential pandemic pathogens. Marco Ajelli

P1-334 Burden of outpatient visits due to influenza infection and cases averted by vaccination—United States, 2011/12 influenza season. Mike Jackson

P1-335 Excess mortality associated with influenza among tuberculosis deaths in South Africa, 1999-2009. Sibongile Walaza

P1-433 Investigation of a nosocomial influenzaA(H3N2) outbreak among geriatric patients and health care workers. Bruno Lina

20.00-20.45 Vaccines

Host: Veronika von Messling, INRS-Institut Armand-Frappier, Laval, Quebec, Canada, and Paul Ehrlich Institute, Langen, Germany

Posters:

P1-163 Influenza awareness and vaccine advocacy in the Asia-Pacific region: the role of the Asia-Pacific Alliance for the Control of Influenza (APACI). Lance Jennings

P1-164 Informing future policy for influenza vaccination programs in sub-Saharan Africa: forging a path for decision-making. Doudou Diop

P1-364 Antibody landscapes: quantifying the antibody response to vaccination and infection. Judith Fonville

P1-413 Characteristics of vaccine failures in a randomized placebo-controlled trial of inactivated influenza vaccine in children. Benjamin Cowling

P1-414 Seasonal influenza vaccine uptake in Kenya in 2012: does father involvement make a difference? Nancy Otieno

Saturday, 7 September 2013

08.00-11.30 — Feature Cornerstone Session: Animal-Human Interface
Ballroom East (Level One)

Chair: Malik Peiris, Centre of Influenza Research, School of Public Health, University of Hong Kong, Hong Kong SAR, China

Mammalian Adaptation of Influenza Viruses: What We Know and What We Don't
Terrence Tumpey, Immunology and Pathogenesis Branch, Influenza Division, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America

Ecology, Evolution, and Human Health Risks From Emerging Swine Influenza Viruses
Richard Webby, Infectious Diseases, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Risk Assessing Animal Viruses for Pandemic Threat
Nancy Cox, WHO Collaborating Center for Surveillance Epidemiology and Control of Influenza, National Center for Immunization and Respiratory Diseases, Coordinating Center for Infectious Disease, Influenza Division, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America

Human Disease Caused by Avian Influenza A/H7N9 and A/H5N1 Virus Infections
Peter Horby, Oxford University Clinical Research Unit - Wellcome Trust Major Overseas Programme, Hanoi, Vietnam, and Singapore Infectious Diseases Initiative, Singapore

The Pros and Cons of Influenza Gain of Function Studies

Panelists include:

- *Yoshihiro Kawaoka, University of Wisconsin Madison, School of Veterinary Medicine, Madison, Wisconsin, United States of America*
- *Charles Russell, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America*
- *Adolfo Garcia-Sastre, Mount Sinai School of Medicine, New York, New York, United States of America*
- *Michael Osterholm, Center for Infectious Disease Research and Policy, University of Minnesota, Minneapolis, Minnesota, United States of America*
- *Marc Lipsitch, Harvard University, Cambridge, Massachusetts, United States of America*
- *Jesse Bloom, Fred Hutchinson Cancer Research Center, Seattle, Washington, United States of America*

11.30-12.00 — Scholarship Awards Ceremony

12.00-13.00 — isirv Annual General Meeting (AGM)

13.00-19.00

Free Afternoon—Discover Cape Town and Western Cape
Discover this dazzling city, sip world-class wines as you explore the world-renowned winelands, or take a scenic tour down the coast to the meeting point of 2 oceans. *Options* delegates are free to explore this wonderful area. A selection of tour options have been arranged with special prices negotiated for the delegates. These tours are at the discretion of the delegate and fees apply, so grab some colleagues and schedule your tour early.

Sunday, 8 September 2013

09.00-9.40

Cross-Cutting Keynote:
Ballroom East (Level One)

Universal Epitopes, Their Application to Vaccines and Therapy, and Importance in Influenza Epidemiology
Peter Palese, Icahn School of Medicine at Mount Sinai, New York, New York, United States of America

09.40-11.00

Morning Plenary Session 3—Diagnostics

Ballroom East (Level One)

Chair:

Wolfgang Preiser, Stellenbosch University and National Health Laboratory Service, Stellenbosch, South Africa

Real-Time PCR
Stephen Lindstrom, National Center for Immunization for Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America

Influenza Whole Genome Analysis and Its Role in Diagnostics, Patient Care, and Public Health
Monica Galiano, Health Protection Agency, London, United Kingdom

Clinical Relevance of Influenza Viral Load Measurement
Nelson Lee, Stanley Ho Center for Emerging Infectious Diseases, The Chinese University of Hong Kong, Hong Kong SAR, China

11.00-11.30

Morning Networking and Refreshment
Exhibition Hall 2 (Level Zero)

11.30-13.00

Mid-Day Plenary Session 3—Clinical

Chair:

Marc Mendelson, Groote Schuur Hospital, University of Cape Town, Cape Town, South Africa

Brave and ISARIC: New Paradigms for Responding to Global Respiratory Threats
Nahoko Shindo, World Health Organization, Geneva, Switzerland

Influenza and Pregnancy
Shigeru Saito, Department of Obstetrics and Gynecology, Graduate School of Medicine and Pharmaceutical Science for Research, University of Toyama, Toyama Prefecture, Japan

The Many Faces of Influenza
Fred Hayden, University of Virginia School of Medicine, Charlottesville, Virginia, United States of America

13.00-14.00 Lunch—on own

14.00-15.30

Concurrent Afternoon Workshops—€

Workshop 5A: Animal-Human Interface
Ballroom East (Level One)

Chairs:
Marietjie Venter, National Institute for Communicable diseases, Pretoria, South Africa
Amalya Mangiri, US Centers for Disease Control and Prevention, Jakarta, Indonesia

Oral Presentations:

O-870 Reduction in airborne virus using modifications of simulated home slaughter of asymptomatic H5N1 HPAI virus infected chickens. David Swayne

O-871 Surveillance for human infections with avian influenza A viruses among live bird market workers and their household members in Dhaka city area, Bangladesh. Sadia Afreen

O-872 TRPM8 and susceptibility to highly pathogenic avian influenza H5N1. Peter Horby

O-873 Characterization of H3N2pM-like and novel reassortant H3N1 swine viruses with pandemic H1N1 2009-like segments isolated in Korea. Philippe Noriel Pascua

O-874 Human infections with avian influenza H7N1 and H5N2 strains during outbreaks in ostriches. Marietjie Venter

O-875 Risk analysis of H2N2 viruses from the avian reservoir. Jeremy Jones

Workshop 5B: Vaccines II
Meeting Room 2.40 (Level Two)

Chairs:
Dave Wentworth, J. Craig Venter Institute, Rockville, Maryland, United States of America
Florian Krammer, Icahn School of Medicine at Mount Sinai, New York, New York, United States of America

Oral Presentations

O-876 Vaccine-induced anti-HA2 antibodies promote virus entry and enhance influenza A virus pathology. Surender Khurana

O-877 Synthetic generation of influenza vaccine viruses for rapid response to pandemics. Pirada Suphaphiphat

O-878 Structure and accessibility of HA trimers on intact 2009 H1N1 pandemic influenza virus to stem region-specific neutralizing antibodies. Audray Harris

O-879 Universal influenza vaccinia vaccine requires CD4+ T cells for heterosubtypic protection. Sophie Valkenburg

O-880 How we can use TLR2-agonist-based adjuvants to improve protection against influenza epidemics and pandemics. Brendon Chua

O-881 Evaluation of influenza A and B viruses isolated and passaged in the qualified MDCK suspension cell line (MDCK33016PF) and embryonated chicken eggs. Heidi Peck

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Workshop 5C: Diagnostics
Meeting Room 2.60 (Level Two)

Chairs: Lance Jennings, Microbiology Health Laboratories, Canterbury Health Laboratories, Christchurch, New Zealand
Amy Krafft, National Institute of Allergy and Infectious Diseases Bethesda, Maryland, United States of America

Oral Presentations:

O-883 Poor correlation of influenza viral load between swabs of clinical samples from the 2011-2012 influenza season in Belgium highlights the importance of standardized sample collection. Liesbeth Van Wesenbeeck

O-884 Quantitative influenza diagnostic testing (QIDT) as a novel biomarker for the monitoring of disease activity at the point-of-care. Barbara Rath

O-885 Do case definitions affect the prediction of influenza virus in different seasons in north India? Rahul Srivastava

O-886 Diagnosis of influenza A/H1N1pdm virus genome by hairpin-type peptide nucleic acid chromatography. Kunihiro Kaihatsu

O-887 Better tests, better guidance, better practice: outcomes of a strategy for improving rapid influenza diagnostic tests. Daniel Jernigan

O-882 H5N1-SeroDetect EIA and rapid test: a novel differential diagnostic assay for serodiagnosis of H5N1 infections and surveillance. Surender Khurana

15.30-16.00 Afternoon Networking and Refreshment
Exhibition Hall 2 (Level Zero)

16.00-17.30

Concurrent Evening Workshops—f

Workshop 6A: Animal Influenza and Models
Ballroom East (Level One)

Chairs: David Suarez, US Department of Agriculture, Athens, Georgia, United States of America
Marietta Ducatez, INRA UMR, Toulouse, France

Oral Presentations:

O-888 Quantifying the global antigenic and genetic evolution in swine influenza A viruses and evaluating the relative zoonotic potential to humans. Nicola Lewis

O-889 Ocular-only aerosol inoculation of ferrets with H7 and H5 influenza viruses. Jessica Belser

O-890 Characterization of the 2012 highly pathogenic avian influenza H7N3 virus isolated from poultry in Mexico: pathobiology and vaccine protection. David Suarez

O-891 The first detection and isolation of avian influenza viruses in Antarctica. Aeron Hurt

O-892 Detection of multiple genotypes of swine influenza viruses in southern China, 2009-2012. Huyi Liang

O-893 Coordinated surveillance of influenza viruses in European pigs: enhanced virological and epidemiological analysis from the European Surveillance Network for Influenza in Pigs (ESNIP3). Sharon Brookes

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Workshop 6B: Surveillance I

Meeting Room 2.40 (Level Two)

Chairs:

Sue Huang, Institute of Environmental Science and Research, Wellington, New Zealand
Maria de Lourdes Aguiar Oliveira, Instituto Oswaldo Cruz, Fiocruz, Rio de Janeiro, Brazil

Oral Presentations:

O-894 Southern hemisphere influenza and vaccine effectiveness research and surveillance (SHIVERS) in New Zealand. Sue Huang

O-895 Applications of pyrosequencing in the molecular surveillance of influenza. Yi-Mo Deng

O-896 The Global Influenza Hospital Surveillance Network (GIHSN): a step forward. Joan Puig-Barberà

O-897 Etiology of two-years hospital-based surveillance of severe acute respiratory infection in Madagascar. Norosoa Harline Razanajatovo

O-898 Establishing a web-based application for respiratory pathogen biosurveillance within a diverse global partner network. Michael J. Cooper

O-899 Patterns of influenza circulation—Latin America and the Caribbean, 2010-2012. Mauricio Cerpa

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Workshop 6C: Clinical Management

Meeting Room 2.60 (Level Two)

Chairs:

Arnold Monto, School of Public Health, University of Michigan, Ann Arbor, Michigan, United States of America
Robin Mason, Respiratory Disease Branch, DMID/NAID/NIH, Bethesda, Maryland, United States of America

Oral Presentations:

O-900 Post-pandemic Review of anti-Influenza Drug Effectiveness (PRIDE Study): an individual patient data (IPD) meta-analysis investigating the impact of antiviral use on severe patient outcomes during the 2009-2010 influenza A(H1N1)pdm09 pandemic. Stella Muthuri

O-901 Indirect effects of oseltamivir treatment of an influenza-infected index case-patient on secondary household transmission: a randomized placebo-controlled clinical trial in a crowded urban area in Bangladesh. Alicia Fry

O-902 Impact of pneumococcal co-infection on disease severity and antibiotic prescriptions in infants and children with influenza: an inception cohort study. Barbara Rath

O-903 Drug dispensing practices for acute respiratory infections and availability of oseltamivir through pharmacies, in Dhaka, Bangladesh. Fahmida Chowdhury

O-904 INSIGHT FLU002 and FLU003, an international cohort study of influenza A(H1N1)pdm09 virus infection, 2009-2012. Dominic Dwyer

O-905 A phase 2, randomized, double blind, placebo-controlled, multicenter study evaluating the safety and pharmacokinetics of different dosing regimens of favipiravir (T-705) in adult subjects with uncomplicated influenza. Carol Epstein

17.30-21.00

Poster Reception—Group 2

Exhibition Hall 2 (Level Zero)

Walkabout Poster Session II
Starting at poster LBA-P2-056

18.00-19.00

Surveillance

Host:

David Swayne, United States Department of Agriculture–Agricultural Research, Southeast Poultry Research Laboratory, Athens, Georgia, United States of America

Posters:

LBA-P2-057 Molecular epidemiology of influenza A virus infections in swine at agricultural fairs in the United States. Andrew Bowman

P2-495 Did intensified surveillance lead to increased detection of human infections with highly pathogenic avian influenza A(H5N1) virus in East Jakarta, Indonesia? Amalya Mangiri

P2-496 Risk analysis of a novel avian H3N8 virus isolated from harbor seals. Erik Karlsson

P2-602 Shedding duration: the key risk factor for spread of highly pathogenic H5N1 avian influenza viruses over long distances by ducks? Mariette Ducatez

P2-603 Susceptibility of bank voles (Myodes glareolus) to infection with H5N1 and H7N1 highly pathogenic avian influenza viruses. Aurora Romero Tejeda

P2-690 Etiology of community-acquired pneumonia among hospitalized children in the United States: preliminary data from the CDC Etiology of Pneumonia in the Community (EPIC) study. Seema Jain

P2-691 The role of influenza infection and other respiratory pathogens: a contribution for improving surveillance of maternal mortality. Maria de Lourdes Aguiar Oliveira

P2-692 Setting up of a surveillance platform for acute respiratory infections in rural North India. Ritvik Amarchand

	P2-693	Epidemiologic, laboratory, and clinical characteristics of human cases of influenza A/H5N1 in Vietnam, 2003- 2013. Nguyen Yen

19.00-20.00 Therapies, Diagnostics, and Management

Host: Wolfgang Preiser, Stellenbosch University and National Health Laboratory Service, Stellenbosch, South Africa

Posters:

LBA-P2-056	Cost-effectiveness of a quadrivalent versus trivalent influenza vaccine in the United States. Pieter de Boer
P2-463	Patterns of influenza A/H1N1 infection and immunity in the Netherlands before and after the 2009 pandemic by analysis of cross-sectional hemagglutinin microarray data. Michiel van Boven
P2-464	Estimating the protective effect of hemagglutination-inhibition antibody against pandemic influenza A(H1N1) infections. Joseph Wu
P2-548	A universal influenza virus vaccine based on the stalk domain of the hemagglutinin. Florian Krammer
P2-549	Live virus and vector-based influenza vaccines for induction of antibodies specific for stalk domain of hemagglutinin. Eun Hye Kim
P2-568	Subtyping and H275Y oseltamivir-resistant H1N1pdm09 influenza virus detection by xTAG fluorescent beads technology. Kirill Krasnoslobodtsev
P2-569	Development of monoclonal antibodies specific for H5 HA and their application to rapid detection of influenza A/H5N1 virus. Hitoshi Takahashi
P2-614	Predicting mortality among hospitalized children with respiratory illness in western Kenya, 2009 -2012. Gideon Emukule
P2-615	Physician's knowledge, attitudes, and practices for pandemic, seasonal, and avian influenza in Indonesia. Amalya Mangiri
P2-713	Is it possible to fight influenza by targeting intracellular redox state? Anna Teresa Palamara
P2-714	Therapeutic or prophylactic treatment with an HA-stem antibody (VIS410) limits respiratory droplet transmission of influenza virus in the ferret model. Kanta Subbarao

Monday, 9 September 2013

09.00-9.40

Cross-Cutting Keynote:
Ballroom East (Level One)

Host Genetics of Human Influenza
Paul Kellam, Wellcome Trust Sanger Institute, Hinxton, Cambridge, United Kingdom

09.40-11.00

Morning Plenary Session 4—Therapeutic Interventions

Ballroom East (Level One)

Chair:

Stephan Ludwig, University of Muenster, Muenster, Germany

Overview on Existing Therapies/Clinical Experience With Neuraminidase Inhibitors
Michael Ison, Northwestern University, Evanston, Illinois, United States of America

Overview on the Role of Immunomodulation, Cellular Factors, and Proteases
Béatrice Riteau, Faculte de Medecine de Laennec, Unité VirPath Lyon, France

Polymerase Inhibitors
Martin Schwemmle, University Hospital Freiburg, Freiburg, Germany

11.00-11.30

Morning Networking and Refreshment
Exhibition Hall 2 (Level Zero)

11.30-13.00

Mid-Day Plenary Session 4—Vaccines

Ballroom East (Level One)

Chair:

Nancy Cox, WHO Collaborating Center for Surveillance Epidemiology and Control of Influenza, Coordinating Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America

Overview of Vaccine Effectiveness Issues and Controversies
Alain Moren, EpiConcept, Paris, France

Next Generation of Influenza Vaccines
Rick Bright, HHS/OS/ASPRA BARDA, Washington, District of Columbia, United States of America

Clinical Aspects in the Development and Licensing of the Russian-Based Live Attenuated Influenza Vaccines for Pandemic Influenza Preparedness in Developing Countries
Larisa Rudenko, Institute of Experimental Medicine of the NorthWest Branch of the Russian Academy of Medical Sciences, St Petersburg, Russia

13.00-14.00

Lunch—on own

14.00-15.30

Concurrent Morning Workshops—G

Workshop 7A: Late Breaking Abstracts
Ballroom East (Level One)

Chairs:

Kanta Subbarao, National Institutes of Health, Bethesda, Maryland, United States of America
Diane Post, Respiratory Diseases Branch DMID/NIAID/NIH/DHHS, Bethesda, Maryland, United States of America

Oral Presentations:

LBA-O-001	Progress in building equitable influenza vaccine production capacity under the Global Action Plan (GAP) for influenza vaccines framework. Jan Hendriks
LBA-O-002	Effectiveness of seasonal influenza vaccination of children in Senegal: year two of a cluster-randomized trial. John Victor
LBA-O-003	Do changes in spirometry correlate with the severity and duration of infection in volunteers experimentally inoculated with influenza, RSV, and HRV in the Human Viral Challenge Model. John Forni
LBA-O-004	The association of age and clinical disease in ferrets infected with influenza A viruses. Kanta Subbarao
LBA-O-005	Patterns of genetic reassortment between endemic swine influenza viruses and pandemic A(H1N1)2009 viruses in Vietnamese pig population. Nobuhiro Takemae
LBA-O-006	A mouse model to assess the utility of antiviral treatments for prevention of contact-dependent transmission of influenza A virus. Kathryn Edenborough

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Workshop 7B: Surveillance II
Meeting Room 2.40 (Level Two)

Chairs:

Mark Tompkins, University of Georgia, Athens, Georgia, United States of America
Pedro Jimenez-Bluhm, School of Veterinary Medicine, University of Wisconsin-Madison, Madison, Wisconsin, United States of America

Oral Presentations:

O-906	Incursion of clade 2.3.2.1 avian influenza viruses into the Mekong Delta of Vietnam. Julie Bryant
O-907	Improving the representativeness of influenza viruses to inform seasonal influenza vaccine strain selection. Caroline Brown
O-908	Influenza epidemiology in Bangladesh: a pre- and post-pandemic comparison of the national hospital-based influenza surveillance findings (2007-2013). Mohammad Aleem
O-909	Surveillance and characterization of influenza viruses circulating in the central region of Chile. Pedro Jimenez-Bluhm
O-910	WHO efforts on global capacity of influenza virus detection and anti-viral susceptibility monitoring. Terry Besselaar

O-911 Circulating seasonal and pandemic influenza A and influenza B virus genotypes from 2009-2012: vaccine strain match and break-through infections in South Africa. Florette Treurnicht

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Workshop 7C: Novel Therapeutics
Meeting Room 2.60 (Level Two)

Chairs: Oliver Planz, Eberhard Karls University, Tübingen, Germany
Tatiana Branovich, St. Jude Children's Research Hospital, Memphis, Tennessee, United States of America

Oral Presentation:

O-913 TCN-032 (anti-M2e mAb) treatment leads to reductions in clinical symptoms and viral shedding in a human influenza challenge study. Eleanor Ramos

O-914 Carrageenan, a broad anti-viral active polymer, in combination with a specific influenza inhibitor—a novel concept for therapeutic interventions. Sabine Nakowitsch

O-915 Resistance to a novel antiviral drug T-705 through increased fidelity of influenza A virus polymerase. Tatiana Baranovich

O-916 A novel antiviral drug Ingavirin® restores the cellular antiviral response in influenza A virus infected cells and enhances viral clearance in ferrets. Andrej Egorov

O-917 Influenza viruses and host cell signaling—identification and preclinical evaluation of novel targets for antiviral therapy. Oliver Planz

O-912 Host gene discovery and drug repurposing for treatment of emerging and re-emerging influenza virus. Mark Tompkins

15.30-16.00 Afternoon Networking and Refreshment
Exhibition Hall 2 (Level Zero)

16.00-17.30

Closing Plenary Session—Public Health

Ballroom East (Level One)

Chair: Marc Mendelson, Groote Schuur Hospital, University of Cape Town, Cape Town, South Africa

Usefulness of Modeling for Decision Making on Influenza
Guy Walker, Department of Health, London, United Kingdom

Non-Pharmaceutical Interventions—Effectiveness and Consequences
Benjamin Cowling, University of Hong Kong, Hong Kong, China, SAR

Update on Global Vaccine Policy
Marie-Paule Kieny, World Health Organization, Geneva, Switzerland

Speaker Presentations

Morning Plenary Session 1 – Virology	Thursday, 5 September	09.40

Accessory genes in influenza A virus

Paul Digard, The Roslin Institute, University of Edinburgh, Easter Bush, Midlothian EH25 9RG, UK

"The influenza virus genome consists of eight segments of single-stranded, negative sense RNA that encode a total of 10 identified polypeptides".

Variations on this statement appear in the introduction of countless molecular virology papers published on influenza A virus (IAV) over the last 30 years. In 2001, the wording had to be updated to "a total of 11 polypeptides", following the discovery of PB1-F2. In 2009 a twelfth primary translation product (PB1-N40) was characterised and since then there has been a multitude of new IAV gene products identified: PA-X, PA-N155, PA-N182, M42, NS3 and others, that could potentially raise the known IAV proteome to over 20. The functions of these polypeptides are not fully characterized, but patterns are beginning to emerge; these newly identified species are often made in low abundance, are non-essential for virus replication but nevertheless affect pathogenicity, and are encoded/expressed by a variable and sometimes low percentage of IAV strains. This talk will summarise some of this data and explain the rationale for altering the standard introduction to:

"The influenza A virus genome consists of eight segments of single-stranded, negative sense RNA that encode a total of 10 identified core polypeptides and a variable, strain-dependent number of accessory proteins".

Gülsah Gabriel, Heinrich-Pette-Institute, Leibniz Institute for Experimental Virology
Hamburg, Germany

Influenza A viruses continue to pose a serious threat to humans due to their ability to cross species barriers, as repeatedly illustrated by pandemics and occasional transmissions of avian influenza viruses of various subtypes (such as H5N1 or H7N9). Interspecies transmission is a complex process which involves a highly orchestrated series of numerous interactions between viral and cellular factors. The cell membrane forms one of the first barriers to be overcome upon avian-mammalian adaptation. Therefore, avian influenza viruses need to switch receptor specificity by acquisition of adaptive mutations in their receptor binding protein, the hemagglutinin. After cell entry, the nuclear envelope presents another major barrier to be crossed by the viral polymerase complex in order to enter the nucleus where viral transcription and replication takes place. Therefore, avian polymerase complexes need to switch their specificity to recognize nuclear import components of the mammalian host.

There is increasing evidence that components of the nuclear import machinery, the import in-α proteins, play a crucial role in influenza virus host adaptation. Here, we discuss recent studies and explore the emerging role of importin-α isoforms in bridging pre- and post-nuclear import processes and their impact on influenza virus host adaptation and pathogenesis.

Morning Plenary Session 2 - Immunology	Friday, 6 September	09.40

Mx restriction of influenza viruses

Otto Haller, Department of Virology, University of Freiburg, Freiburg, Germany

Innate immune responses play a key role in containing influenza A viruses (FLUAV) in the infected host. In some species, Mx proteins are the main interferon-induced restriction factors blocking FLUAV[1]. Mx proteins belong to the dynamin family of large GTPases and consist of three functional domains, namely (i) the aminoterminal "G domain" that binds and hydrolyses GTP, (ii) the central "bundle signaling element" which connects the "G domain" to the "stalk" and (iii) the "stalk" which mediates self-assembly into highly ordered oligomeric rings required for antiviral action[2]. Using an evolutionary approach, the unstructured loop L4 protruding from the compact stalk was identified as the interface responsible for viral target recognition[3]. We propose that MxA binds via loop L4 to the viral nucleoprotein NP and then oligomerizes around the viral nucleocapsid, leading to impairment of its replicative function. Interestingly, influenza A virus strains differ in their Mx sensitivities. Avian strains have high and human strains have low sensitivities towards human MxA, suggesting a degree of MxA adaptation. We identified adaptive mutations in the nucleoprotein (NP) of pandemic strains A/Brevig Mission/1/1918 and A/Hamburg/4/2009 that confer MxA resistance. These resistance-associated amino acids in NP differ between the two pandemic strains but form a similar discrete surface-exposed cluster in the body domain of NP, indicating that MxA resistance evolved independently. We conclude that human MxA represents a barrier against zoonotic introduction of avian influenza viruses into the human population and that adaptive mutations in the viral NP should be carefully monitored.

1) Haller, O, Kochs, G, J Inteferon & Cytokine Research 31: 79-87 (2011), review
2) Gao, S, Von der Malsburg, A, et al. Immunity 35: 514-525 (2011)
3) Mitchell PS, Patzina C et al., Cell Host & Microbe 12, 598-604 (2012)

Feature Cornerstone Session	Saturday, 7 September	08.00

Mammalian adaptation of influenza viruses: what we know and what we don't.

Terrence M. Tumpey, Immunology and Pathogenesis Branch, Influenza Division, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia

Avian influenza viruses are capable of causing significant human illness and death, and continue to pose a pandemic threat to human health should they acquire a transmissible phenotype. Due to the expanding host and geographic range of avian influenza viruses, such as H5 and H7 subtypes, researchers aim to better understand the contribution of both virus and host responses involved in mammalian adaptation of influenza viruses. The use of small mammalian models has become indispensable for understanding the contributions of influenza virus genes and molecular determinants responsible for transmission and host disease. Ferrets and guinea pigs have become the primary models of choice for studying the molecular determinants responsible for efficient transmission, despite a general lack of available immunological reagents. Conversely, mice have been used extensively for the assessment of pathogenesis and virus-host responses. This work will highlight phenotypes of novel emerging avian influenza viruses in mammals and review the contributions of virus genes and molecular determinants involved in efficient transmissibility of influenza viruses. Influenza viruses continue to emerge and cause human infection, so there remains a need to better understand the pathogenicity and transmission of potentially pandemic influenza viruses so that we may develop improved methods for their prevention and control. play a crucial role in influenza virus host adaptation. Here, we discuss recent studies and explore the emerging role of importin-α isoforms in bridging pre- and post-nuclear import processes and their impact on influenza virus host adaptation and pathogenesis.

Detection of Novel Influenza Viruses in the United States by Real-Time RT-PCR

S. Lindstrom, Influenza Division, Centers for Disease Control and Prevention, Atlanta, GA, USA

Influenza laboratory surveillance and diagnosis testing systems that perform routine subtype characterization of seasonal human influenza A viruses facilitate the detection of novel influenza A viruses of animal origin that do not normally infect humans. In recent years, molecular diagnostic methods utilizing real-time RT-PCR (rRT-PCR) have improved the capability and timeliness for laboratories to identify influenza viruses. The Centers for Disease Control and Prevention (CDC), U.S.A. developed and implemented the Human Influenza Virus rRT-PCR Detection and Characterization Panel (CDC rRT-PCR Flu Panel), an assay for rapid detection and characterization of human influenza viruses designed for universal detection of all influenza type A and type B viruses as well as identification human A/H1, A/H1pdm09 and A/H3, as well as Asian avian A/H5. Laboratories using the CDC rRT-PCR Flu Panel are able to identify novel influenza virus infections in humans, such as avian A/H5, A/H7 or A/H9, when influenza A viruses are detected that cannot be characterized as human influenza A/H1, A/H1pdm09 or A/H3 viruses and are reported as "unsubtypable". Also, since 2009, public health laboratories (PHLs) in the United States (US) that received training and reagent support to use the CDC rRT-PCR Flu Panel have periodically reported human specimens as "inconclusive" that were positive for InfA, H3, and pdmInfA markers and negative for H1 and pdmH1 markers and were subsequently identified as A/H3N2v viruses similar to those circulating in swine in the US. In 2012, the CDC reported a total of 309 A/H3N2v cases from 12 states that were all initially identified as "inconclusive" by state PHLs using the CDC Flu rRT-PCR Panel. Furthermore, analytical and clinical performance evaluation demonstrated that the CDC Flu rRT-PCR Panel is able to accurately detect the A/H3N2v virus in clinical specimens in the US. CDC subsequently obtained FDA clearance that allows US PHLs to report test results that are positive for InfA, H3 and H1pdm09 markers, and negative for H1 and H1pdm09 markers as "presumptive positive" for A/H3N2v virus.

Ongoing efforts to improve the capacity for molecular testing using real-time RT-PCR allow for improved response and rapid detection of novel influenza strains in humans. However, as influenza viruses evolve, it is necessary to monitor the performance of diagnostic tests against circulating viruses and to provide updated reagents and protocols as well as guidelines for interpretation of test results when necessary.

Influenza whole genome analysis and its role in diagnostics, patient care, and public health

Dr Monica Galiano, Virus Reference Department, Public Health England, London, United Kingdom

The development of high-throughput sequencing and whole genome analyses has improved our understanding of global influenza molecular genetics and epidemiology, resulting in a valuable tool for influenza scientific research. From the perspective of an influenza reference and diagnostic laboratory, viral genome sequences have been increasingly used to supplement influenza virus strain surveillance, to aid in the design and evaluation of new molecular diagnostic assays and has also enabled the study of different aspects such as outbreak investigations and identification of genetic markers associated with virulence, transmissibility, antiviral resistance and other biological features which are of great interest in our field. Furthermore, next-generation sequencing provides high speed and throughput with an unprecedented volume of output data, with the potential for many possible applications in both research and diagnostic settings.
We will discuss the utility and impact of whole genome sequencing of influenza as a routine tool in the laboratory setting, from the day-to-day molecular diagnostics for seasonal influenza viruses to the more challenging task of identifying and characterising novel emergent influenza strains with pandemic potential.

Clinical relevance of influenza viral load measurement

Nelson Lee, Stanley Ho Center for Emerging Infectious Diseases, The Chinese University of Hong Kong, Hong Kong SAR, PRC

Quantitative PCR (qPCR) has been used for rapid virus detection in respiratory and non-respiratory clinical samples and to reflect the virus burden ('viral load') in influenza patients. There is also a recent trend to use qPCR results to guide treatment decisions, to monitor response, and to estimate transmissibility of infection in the hospitalized. Our experience and review of available data suggest that: (1) qPCR is more sensitive than culture for virus detection in symptomatic patients; (2) results can be influenced by the differences in virokinetic profiles in the upper and lower respiratory tracts; (3) interpretation of results concerning non-respiratory samples is difficult due to unknown sensitivity and specificity; (4) some correlations exist between 'viral load' and disease severity, clinical progress, and cytokine expression (e.g. symptom scores, influenza complications, duration of illness, interleukin(IL)-6), but confounded by multiple factors such as time interval from illness onset; (5) serial monitoring may assist early detection of secondary antiviral resistance. The use of qPCR result as an 'end-point' in clinical trials has remained controversial. Understanding these limitations and consideration of the clinical context may help healthcare practitioners to correctly interpret qPCR results.

Related works

1) Lee N, Chan PK, Hui DS, et al. Viral loads and duration of viral shedding in adult patients hospitalized with influenza. *J Infect Dis.* 2009;200(4):492-500.
2) Lee N, Chan PK, Wong CK, et al. Slow viral clearance and hyperactivated inflammatory responses in adults hospitalized for severe pandemic 2009 influenza A(H1N1) virus pneumonia. *Antivir Ther* 2011;16:237-47.
3) Chan MCW, Lee N, Chan PK, et al. Seasonal Influenza A Virus in Feces of Hospitalized Adults. *Emerg Infect Dis* 2011;17:2038-42.
4) Lee N, Wong CK, Chan PK, et al. Acute encephalopathy associated with influenza A infection in adults. *Emerg Infect Dis.* 2010;16(1):139-42.
5) Lee N, Wong CK, Hui DSC, et al. Role of Human Toll-like Receptors in Naturally Occurring Influenza A Infections. *Influenza Other Resp Vir,* 2013 Apr 1. doi: 10.1111/irv.12109
6) Hui DS, Lee N, Chan PK. Clinical management of pandemic 2009 influenza A(H1N1) infection. *Chest.* 2010;137(4):916-25.

Influenza and pregnancy

S Saito, Department of OB/GYN, University of Toyama, Toyama-shi, Toyama, Japan

Objective: Pregnant women are prone to serious complications when they contract pandemic (H1N1) 2009 influenza, and a considerable number of infected pregnant women died worldwide. However, no maternal mortality occurred in Japan during this pandemic. We discuss the reasons why maternal mortality did not occur in Japan. Clinical data: Mortality of pregnant women infected with pandemic influenza A (H1N1) was several times higher compared with that in nonpregnant women in many countries. Compared with nonpregnant individuals, pregnant women are approximately 4-5 times more likely to develop severe disease, with the highest risk occurring in the third trimester. However, no maternal mortality was observed among pregnant Japanese women. We discuss what factors contributed to the lack of maternal mortality in Japan during this pandemic. Total 53 maternal death cases in 1.10 million of total birth and 45 maternal death cases in 1.10 million of total birth maternal were reported in 2009 and 2010, respectively, in Japan. National data showed no maternal mortality due to pandemic (H1N1) 2009 among pregnant Japanese women in 2009 and 2010. The Japan Society of Obstetrics and Gynecology (JSOG) recommended the following; (i) prompt use of antiviral drugs for treatment of

pregnant women on May 8, 2009 via website, (ii) an early visit to the general practitioner when they run a high temperature on June 16, 2009, (iii) active use of antiviral drugs for prophylaxis after close contact with an infected person on Aug 4, 2009, and (iv) vaccination against the pandemic (H1N1) 2009 strain on Sept 7, 2009. The number of visit to the JSOG website increased to 193,705 in Oct 2009. Yamada's paper (*JOGR. 2012:38:130-136*) showed that antiviral medicines for prophylaxis was performed in 40,000-50,000 pregnant women, and 60% of pregnant women were vaccinated within 1.5 months after availability of a vaccine against pandemic H1N1 influenza. These treatment reduced the infection rate in Japanese pregnant women from general infection rate in Japan; 12% to 3.5% in pregnant women. Nakai et al. (*J Infect. 2011:62:232-233*) reported the clinical data of 181 hospitalized women in Japan. These cases covered around 70% of pregnant women in Japan. Seventeen (9.4%) developed pneumonia, 2 of these required admission to an ICU, and all 181 cases recovered completely. These rates were quite low compared with those in other countries. Over 90% of infected cases were treated with antiviral agents within 48 h, and pregnant women who received antiviral agents after 48 h were 5.8 times more likely to develop pneumonitis than those in early treatment group. We have reported that short-term prognosis of infants exposed to oseltamivir or zanamivir in utero were not adversely affected (Saito S, et al. *Am J Obstet Gynecol.* 2013. doi: 10.1016/j.ajog.2013.04.007). Conclusion: 1) The information on the website is very effective to inform the prevention and treatment of influenza to common citizen. 2) High rate of vaccination to pregnant women, antiviral medicines for prophylaxis and antiviral medicines within 48 h after onset are effective to reduce the maternal complications and maternal mortality. 3) The safeties of vaccination and oseltamivir to pregnant women have been reported.

Overview on the role of immunmodulation, cellular factors and proteases

B. Riteau, EA4610, University Lyon, France

Influenza is one of the most common infectious diseases in humans occurring as seasonal epidemic and sporadic pandemic outbreaks. To date, unfortunately, our current repertoire of antiviral remedies against these pathogens is limited to two approved classes of compounds, to which a drastic increase in viral resistance has occurred in recent years. The major reason for the rapid acquirement of mutations that allow influenza viruses to replicate in the presence of the licensed anti-influenza drugs is that these compounds target viral proteins in the face of a high viral mutation rate, making these substances unsecure. Therefore to fight against Flu, our efforts should include the production of new or improved influenza antiviral drugs against a broad range of influenza strains and that limit the emergence of resistance viruses.

To overcome this challenge of resistance, molecules that target cellular factors instead of the virus are of particular interest. Two different strategies attempting to find novel host target to fight influenza viruses exists; ie: slowing down virus replication or modulating the innate immune response. The first strategy is based on the strong dependency of influenza viruses to cellular host factors at different steps of the virus cycle. The second one is based on the observation that the hallmark of influenza pathogenesis is due to a deleterious inflammation of the lungs. Here we will give an overview of the current research on this topic and will focus in particular on protease-activated-receptor 1 and plasminogen as promising new strategies to fight influenza.

Inhibitors of the influenza virus replication machinery

M. Schwemmle, University Hospital Freiburg, Freiburg, Germany

Influenza is a highly contagious acute viral infection, which causes annual epidemics as well as devastating pandemics. As shown for H5N1 and H7N9 viruses, avian influenza A viruses can sporadically transmit into the human population, causing severe disease symptoms and death. To date, only few approved antivirals, like the well-known neuraminidase inhibitors, are available that protect from influenza viruses and its associated disease symptoms. However, due to the frequent emergence of drug resistant virus strains there is an urgent need for the development of alternative antivirals. The viral polymerase machinery responsible for the amplification of the viral genome and mRNA transcription represents an attractive target. Indeed, recent structural and functional insights into the replication strategy of influenza viruses as well as high throughput screening assays revealed new antiviral compounds that specifically block influenza virus replication.

Mid day Plenary Session – 4, Vaccines | Monday, 9 September | 11.30

Clinical aspects in the development and licensing of the Russian-based live attenuated influenza vaccines for pandemic influenza preparedness in developing countries

L. Rudenko, Institute of Experimental Medicine (IEM), St. Petersburg, Russia

Background: Live attenuated influenza vaccines (LAIVs) generated by IEM have been used in Russia in all age groups since 1987. Production of LAIVs is based on the classic reassortment methodology, ie, 6 genes from an attenuated donor backbone strain are combined with genes coding for hemagglutinin and neuraminidase of circulating influenza virus strains. Currently all licensed LAIVs are produced in embryonated eggs. From 1997, when highly pathogenic avian influenza viruses began to circulate in Asia, IEM concentrated on the development of candidate pandemic LAIVs. The first pandemic H5N2 vaccine was registered in Russia in 2008. Further development relating to H5N1, H7N3 and H2N2-based candidate vaccines are in progress in different stages within a collaborative agreement with PATH. A major initiative launched by the World Health Organization (WHO) to meet the Global Pandemic Influenza Action Plan objective to increase vaccine supply supported transfer of influenza vaccine production technology to developing countries. For pandemic surge capacity, egg-based LAIV manufacturing technology has clear advantages over inactivated influenza vaccine (IIV) with its significantly higher yield, needle-free delivery and benefits of wider cross-protection. This made LAIV an attractive option in developing countries, particularly those with very large populations. From 2009 WHO has granted access to the technology to 3 organizations—the Government Pharmaceutical Organization (GPO) in Thailand, the Serum Institute of India (SII), and BCHT in China. At the same time IEM signed an agreement with WHO for the supply of the Russian LAIV reassortants, provide training to staff and consulting to new users of the technology. Materials and Methods: LAIVs were produced by Russian Manufacture "Microgen" on the basis of the license agreement with IEM. We evaluated the safety, infectivity, genetic stability, transmission and immunogenicity of 2 doses of 107.0EID50/0.2 ml of A/17/California/2009/38 (H1N1), 107.6EID50/0.2 ml of A/17/mallard/Netherlands/00/95(H7N3), 108.5EID50/0.2 ml of A/17/turkey/Turkey/05/133 (H5N2) vaccines administrated by nasal spray 4 weeks apart to healthy volunteers in an inpatient isolation unit operated by the Institute of Influenza in St Petersburg. The total of 140 subjects were enrolled who received either vaccine or placebo. Results: The studies showed no significant adverse reactions attributable to the vaccines, and suggested that all tested vaccines are as safe as seasonal LAIV. For confirmation of genetic stability and transmissibility of LAIV post vaccination we assessed viral shedding, genotype and phenotype of shed viruses. It was confirmed that during replication of the vaccine virus in vivo, no reversion to the wild-type phenotype occurred. Vaccine viruses retained their phenotypic characteristics and did not revert at nucleotides known to confer an attenuated phenotype on the molecular level. Vaccine viruses were not detected among volunteers from placebo group, confirming no transmission from vaccinated to nonvaccinated volunteers. Results from the clinical studies also demonstrated that all pandemic candidates were effective in generating humoral and cellular immune responses. Cumulative data on immune responses which included not only

HAI and MN tests but also additional immunological methods such as measuring IgG and IgA by ELISA and cytokine assays showed that 80%-90% of vaccinated volunteers had serum and/or local antibodies and generated CD4+ and CD8+ immunological memory T-cells. Conclusion: In summary, preclinical and clinical data generated with prepandemic LAIV vaccines were transferred to partners from developing countries to facilitate the potential use of this promising vaccine technology to control epidemic and pandemic influenza outbreaks. SII registered its pandemic H1N1 LAIV in India in August 2010, and by November 2010, over 2.5 million people were vaccinated with this vaccine. SII is now in the process of registering its trivalent seasonal LAIV with vaccine strains developed by IEM. In 2011 GPO registered its pandemic LAIV. Both companies continue clinical trials, with seasonal LAIV among children 2-5 years old (SII) and with pandemic H5 (Phase II, GPO). BCHT finished preclinical studies for the seasonal LAIV and has applied for permission to initiate clinical trials among children, adults and elderly. This work was supported by PATH.

Closing Plenary Session – Public Health	Monday, 9 September	16.00

Update on global vaccine policy

Marie-Paule KIENY, Assistant Director-General, Health Systems and Innovation, World Health Organization (WHO)

The Global action plan for influenza vaccines (GAP) which aims to address equitable access to and evidence-based use of influenza vaccines to protect populations against seasonal or pandemic influenza is built on three pillars (increase in seasonal vaccine use; increase in global influenza vaccine production capacity; and promotion of further research and development). These three pillars, , are intimately linked to, and are to a large extent dependent on the formulation and adoption of evidence-based policies on influenza vaccine use. Such policies need to take into account influenza disease burden and vaccine effectiveness in different segments of the population. These policies, in conjunction with consideration of competing priorities, will drive national decisions on influenza vaccine procurement and use, which in turn will drive increase or decrease of vaccine production capacity. Likewise, recognition of the relatively limited effectiveness of current vaccines in some populations is a potent motivation for research and development of novel vaccine formulations.

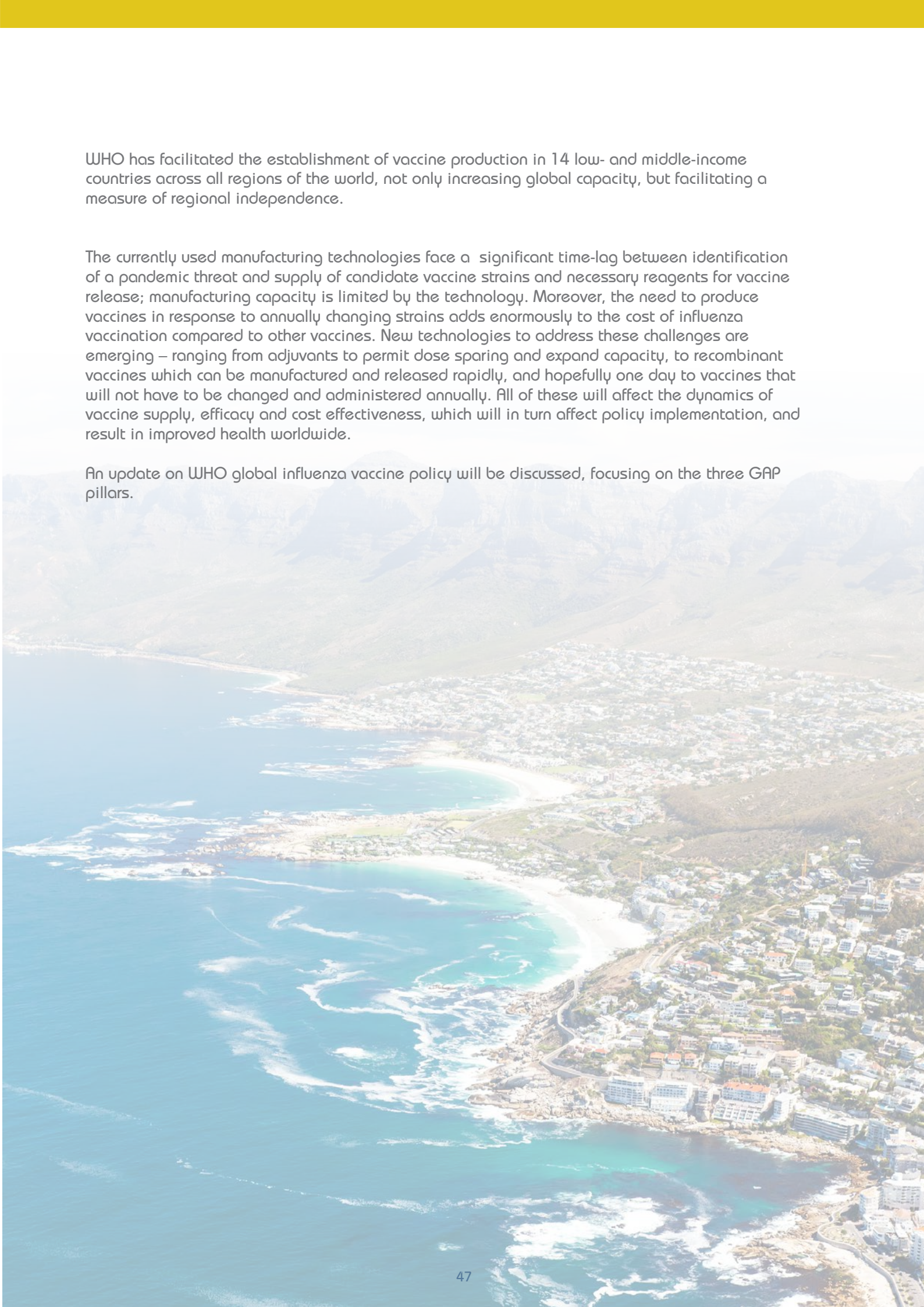
At this moment, only a limited number of countries have seasonal influenza vaccine in their national immunization programme, and even fewer are on target to meet the target of 75% coverage in the elderly following resolution WHA56.19 adopted in 2003. The WHO Strategic Advisory Group of Experts on Immunization (SAGE) has reviewed the evidence of vaccine burden, performance, cost effectiveness and operational issues for specific target populations and risk groups and has issued in 2012 global recommendations for influenza vaccination in five priority groups including: pregnant women, health care workers, children under 5, elderly, and people with underlying health conditions. For each of these groups, the evidence supporting influenza vaccine use has been evaluated, and grade tables rating the quality of the evidence in support of the recommendations produced, identifying the knowledge gaps and research to be conducted to fill these gaps. The knowledge gaps include for example current limited data on vaccine efficacy in some of the target groups, lack of results obtained in placebo-controlled clinical trials, small trial sizes, bias in the trials, limited safety assessments. Some of the recommendations themselves create challenges that need to be addressed, such as assuring year-round supply of vaccines for pregnant women, and ensuring that the product inserts are compatible with this policy.

These global recommendations can be used by countries to inform national vaccine policies Amongst the challenges to implementing any influenza vaccine policy is the access to affordable vaccine and the cost of delivery in the face of other health priorities. WHO monitors the global vaccine production capacity which has grown from 500 million doses in 2006 to over 1.4 billion doses in 2012. While this capacity meets current seasonal vaccine demand, it would be insufficient to meet the demand for vaccine in the event of a pandemic. To address this constraint,

WHO has facilitated the establishment of vaccine production in 14 low- and middle-income countries across all regions of the world, not only increasing global capacity, but facilitating a measure of regional independence.

The currently used manufacturing technologies face a significant time-lag between identification of a pandemic threat and supply of candidate vaccine strains and necessary reagents for vaccine release; manufacturing capacity is limited by the technology. Moreover, the need to produce vaccines in response to annually changing strains adds enormously to the cost of influenza vaccination compared to other vaccines. New technologies to address these challenges are emerging – ranging from adjuvants to permit dose sparing and expand capacity, to recombinant vaccines which can be manufactured and released rapidly, and hopefully one day to vaccines that will not have to be changed and administered annually. All of these will affect the dynamics of vaccine supply, efficacy and cost effectiveness, which will in turn affect policy implementation, and result in improved health worldwide.

An update on WHO global influenza vaccine policy will be discussed, focusing on the three GAP pillars.



Sightseeing and Special Tours

The *Options* conference has taken place in many locations around the world, and cultural events have always been an important part of the conference experience. Cultural tours allow the *Options* conference to give back to its host city, and also provide delegates with once-in-a-lifetime experiences. This year, a variety of tours will be available to all attendees to experience during and after the meeting. A selection of tour options have been arranged with special prices negotiated for the delegates. These tours are at the discretion of the delegate and fees will apply.

Half-Day Tours

City Tour

This guided tour takes delegates to Table Mountain, Green Market Square, and many other famous Cape Town landmarks.

Cape Point Tour

Enjoy scenic views of the Atlantic Ocean en route to Hout Bay. This tour will take delegates over the famous Chapman's Peak drive to Cape Point where the Atlantic Ocean meets the Indian Ocean.

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Delegates on this tour can experience wine tasting and a cellar tour at Anura Wine Estate, followed by a historic tour of Stellenbosch.

Township Tour

This guided tour will allow delegates to observe daily life in several of the townships around Cape Town, including Langa, Nyanga, Crossroads, and Gugulethu. A visit to the District Six museum is also included. A township tour on bicycles that have been renovated by members of the local community is also available.

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Visit this world-renowned botanical garden set against the backdrop of Table Mountain and Devil's Peak. This garden is home to over 22,000 indigenous plants.

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Take off on an adventure along the Atlantic seaboard! Delegates will experience a 30-minute helicopter flight following the coastline through Bantry Bay, Clifton, Camps Bay, and the 12 Apostles.

Full-Day Tours

Many of the above half-day tours can be expanded in to full-day tours. Other full-day tours include a cultural tour of the townships combined with a tour of Robben Island, the Whales and Wine tour in Hermanus, and a safari at Aquila Game Reserve.

For more information on any of these tours, please visit the hospitality desk

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Dragon Fly has a range of tours options with specially negotiated prices for the delegates to take on the free Saturday afternoon and they can also assist with dinner reservations, ground transfers and local entertainment. These tours are at the discretion of the delegate and fees apply. Please stop by their hospitality desk in the registration area.

Hospitality Desk Hours	
Wednesday, 4 September	13.00-17.00
Thursday, 5 September	09.00-17.00
Friday, 6 September	09.00-17.00
Saturday, 7 September	09.00-13.00
Sunday, 8 September	09.00-17.00
Monday, 9 September	09.00-17.00

Exhibitor Information

GISAID Initiative,

a Global Initiative on Sharing All Influenza Data

Booth #:1

Address: Federal Office for Agriculture & Food (BLE)
Deichmanns Aue 29
City: Bonn
Postal Code: 53179
Country: Germany
Phone: 02 28 99 6845 3080
eMail: contact@gisaid.org
URL: http://gisaid.org
Contact: Cheryl Bennett, cheryl@gisaid.org

A Global Initiative on Sharing All Influenza Data

GISAID's publicly accessible EpiFlu™ database offers the largest collection of influenza sequences and associated metadata (clinical-epidemiological). Thousands of researchers collaborate and uphold GISAID's unique sharing mechanism by protecting the rights of data submitters. GISAID is used for the WHO's biannual vaccine-strain-selection and recently afforded the timely distribution of H7N9 data.

International Society for Influenza and other Respiratory Virus Diseases (isirv)

Booth #: 2

isirv International Society for Influenza and other Respiratory Virus Diseases

Address: 17 Sunnyfeld, Mill Hill
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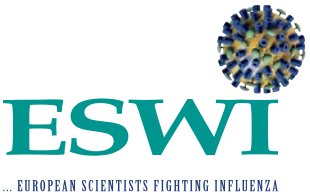
Website: www.isirv.org
Contact: Paul Sommerfeld, paulsommerfeld@isirv.org

The International Society for Influenza and other Respiratory Virus Diseases (isirv) is an independent scientific professional society promoting the prevention, detection, treatment, and control of influenza and other respiratory virus diseases. isirv plays a key role in the dissemination of information in this broad and challenging field by facilitating the interaction of scientists and public health specialists and by promoting international collaborative efforts against these diseases. Influenza and Other Respiratory Viruses is the official isirv journal and is the first journal to focus exclusively on influenza and other respiratory viruses.

European Scientific Working group on Influenza *(ESWI)*

Booth #: 3



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Contact: David dePooter(ESWI manager), david.depooter@eswi.org, Monica Symons, monica@semiotics.be

European Scientific Working group on Influenza (ESWI) is a multidisciplinary partnership of academia and stakeholder organizations representing healthcare professionals, public health officials, at-risk patients, and the elderly. ESWI's partners all share the aim to reduce the impact of influenza in Europe. www.eswi.org - www.flucommunity.org

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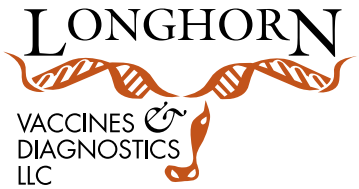
Address: PO Box 5127 Alphington
City: Victoria
Postal Code: 3078
Country: Australia
Phone: +61(0)4000 355 29
Contact: Belinda Esperson, measuredsolutions@bigpond.com
Website: fluiiq.com

The flu-iiQ™ Influenza Intensity and Impact Questionnaire was developed to improve outcomes measurement in influenza clinical trials. It is a Patient Reported Outcomes (PRO) measure that meets strict PRO development and validation standards. The flu-iiQ™ is used as a primary or secondary outcomes measure and is available in 25+ languages.

Longhorn Vaccines
Booth #: 7



Address: 2 Bethesda Metro Center
City: Bethesda
State: Maryland
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Country: United States of America

Longhorn Contact: Chris Helm, chris@lhnvd.com, +1.3014018388
MDG Health Solutions Contact: Bruce Manuel, bruce@mdghealth.co.za, +27.725837988

Longhorn's Prime PCR System includes PrimeStore® MTM for safe collection, transportation, molecular diagnostics, gene sequencing, and storage of high-quality nucleic acid (RNA/DNA) samples at ambient temperature and PrimeMix® mastermix PCR assays for influenza A, B, H1, H3, H5, and other pathogens (MTB, Malaria). MDG Health Solutions is our African partner.

Roche
Booth #: 8

Address: F. Hoffmann-La Roche AG
Pharmaceuticals Division MGSM
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Roche is the world's largest biotech company, with truly differentiated medicines in oncology, infectious diseases, inflammation, metabolism, and neuroscience. Roche's personalised healthcare strategy aims at providing medicines and diagnostic tools that enable tangible improvements in the health, quality of life, and survival of patients.

Sanofi Pasteur
Booth #: 9

Address: 2 Avenue Pont Pasteur
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Celine Mecemmene, celine.mecemmene2@sanofipasteur.com

Sanofi Pasteur is the vaccines division of Sanofi. Our vision is a world in which no one suffers or dies from a vaccine-preventable disease. Sanofi Pasteur is the largest company in the world devoted entirely to human vaccines. We distribute more than 1 billion doses of vaccine per year, making it possible to vaccinate more than 500 million people across the globe.

The *Options for the Control of Influenza VIII* Organizing Committee and Scientific Program Committee would also like to thank the following exhibitors and sponsors for their participation in *Options VIII*.

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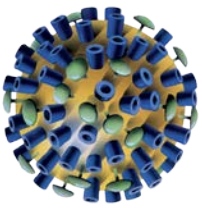

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International Society for Influenza and other Respiratory Virus Diseases: isirv

isirv is an independent and international scientific professional society promoting the prevention, detection, treatment, and control of influenza and other respiratory virus diseases. It aims to provide opportunities for the exchange of information and for international collaboration between those with a scientific interest in any aspect of influenza and other respiratory viral infections. Thus, its activities include the organization of scientific meetings, promotion of scientific and clinical training, dissemination of information on the impact of acute respiratory viral disease both locally and globally, and publication of scientific information, notably through the journal *Influenza and other Respiratory Diseases*.

The society has lead responsibility for organizing the *Options for the Control of Influenza* conferences, the largest international gatherings exclusively devoted to influenza prevention, control and treatment, including seasonal flu and pandemic preparedness www.isirv.org

About the *Options VIII* Conference

The *Options* conference is held every 3 to 4 years and is the largest international conference exclusively devoted to all aspects of influenza from basic science to health care policy and pandemic planning. The Organizing and Scientific Committees and Faculty members at the *Options* conference are comprises of leaders and experts on the front line against this formidable advisory.

In addition to basic science, *Options VIII* will provide highly focused information on specialized matters such as the H7N9 outbreak, influenza in immunocompromised patients and those with comorbid conditions, influenza and pregnancy (including an emphasis on clinical impact, pathogenesis, and consequences for the mother and fetus), along with updated seasonal flu information and issues around increasing vaccine production in middle- and low- income countries.