

How to control a pandemic in this globalization era — the H1N1 2009 experience

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Public Health Emergency of International Concern (PHEIC):

**'an extraordinary event which ...
constitutes a public health risk
to other States through the
international spread of disease
and (which) require a
coordinated international response'**

- IHR (2005)



The influenza A (H1N1) 2009 experience

- Initial travel related Public Health (PH) measures
 - Panic reactions: politicians, media
 - Entry measures
 - Exit measures, other >>> **Conclusions**
- PH measures for international mass events: **hajj**
- PH / **individual** measures in times of pandemic
 - General hygiene
 - Vaccination
 - Antivirals

WHO recommendations

- “WHO is not recommending travel restrictions related to the outbreak of ... influenza A(H1N1)...“

Influenza A(H1N1) - update 31

Individuals who **are ill should delay travel plans** and returning travelers **who fall ill should seek appropriate medical care**. These recommendations are prudent measures which can limit the spread of many communicable diseases, including influenza.

www.who.int/csr/don/2009_05_17/en/index.html



Panic reaction by politician: Suspend flights

- Europe urged to stop flights, April 29
- *„We will ask our European colleagues to consider the suspension of flights going to Mexico,“ French health minister Roselyne Bachelot said Wednesday after talks in Paris with President Nicolas Sarkozy.*
- But the European Commission cannot impose an EU-wide ban, an official said.



What if travelers use other hubs?!



Panic reaction by politician + media: Close borders



- **April 28, 2009** The Pan American Health Organization / World Health Organization (PAHO/WHO) advises countries **not to restrict regular travel or to close borders.**

http://new.paho.org/hq/index.php?option=com_content&task=view&id=1286&Itemid=569

- **May 3, 2009** “If this is so important, why haven’t we closed the border?” Fox News

The **non-coordinated** response: What travel advisories have been issued?

GPHIN, 6 May 2009 — Examples

- No travel restriction
 - Postpone non-essential travel — all
 - To Mexico
 - To Mexico, US, Canada
 - To countries with confirmed case
 - To Portugal
 - To Britain, Spain and US
 - To **China**
 - Ban non-stop flights to Mexico
 - Scan all PAX from Mexico, US
 - Self-quarantine 10 days after travel
 - Closure of borders
- WHO, UN (unless scientific basis)
- India, Malta, New Zealand**
Canada, **Indonesia, Israel, USA**
Malaysia
Australia, Belize, Bosnia, Kuwait
Chinese Taipeh (Taiwan)
Uganda
Mexico
Argentina, China, Cuba, Peru
Chile, France, some **Pacific Islands**
WHO in the **Philippines**
neighbours of Ukraine (Nov 2009)

Inbound measures — in flight

- Doctor on board: Lufthansa LH 499 MEX-FRA only
- Cabin crew invited to observe and report
- **Captain must notify ATC about sick passengers:**
 - ICAO, Aircraft general declaration — Annex 9, Appendix 1: “...signs and symptoms for suspected communicable diseases, updated” (www.icao.int/icao/en/med/guidelines.htm)
 - Fever (temperature $\geq 38^{\circ}\text{C}/100^{\circ}\text{F}$) PLUS ≥ 1 of following
 - Appearing obviously unwell
 - Persistent coughing
 - Impaired breathing (etc.)
- ICAO State letter AN 5/22-07/55; 20 Jul 07
- **‘Global harmonization is the goal’ Dr. Evans**
- See also IHR, Article 28, 5



Health professionals on arrival

- Visual screen in cabin / while deplaning

BUT: how to diagnose influenza in 10 seconds

- Other screens

- Temperature

BUT: many H1N1 patients afebrile!

Passenger afebrile in incubation period

- Physical examination

BUT: what to examine: throat, chest, other?

- To reply to questions: OK

Health professionals on arrival

- Visual screen in cabin / while deplaning
- Other screens
 - Temperature
 - Physical examination



H5N1 Exercise Zurich Airport, 7/8 April 2009



Temperature check devices

- Mainly introduced on **Asian** airports
- Demonstrated to be ineffective in SARS:
35 million screened,
0 cases detected (!)

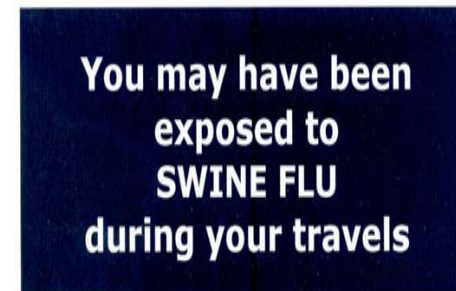
Bell DM, EID 2004;10:1900-6

Bangkok Airport, 27 Apr 09



Information leaflets

- Transmitted to each PAX vs. self-serve
- Information on
 - A(H1N1) / „new influenza“
 - Typical symptoms are...
 - What to do if symptoms
 - occurred during flight
 - occur within 7 days



IMPORTANT!

Do you feel like you have a fever now AND have a cough or sore throat?

If YES, please tell a customs or public health officer or immediately seek medical care and show them this card.

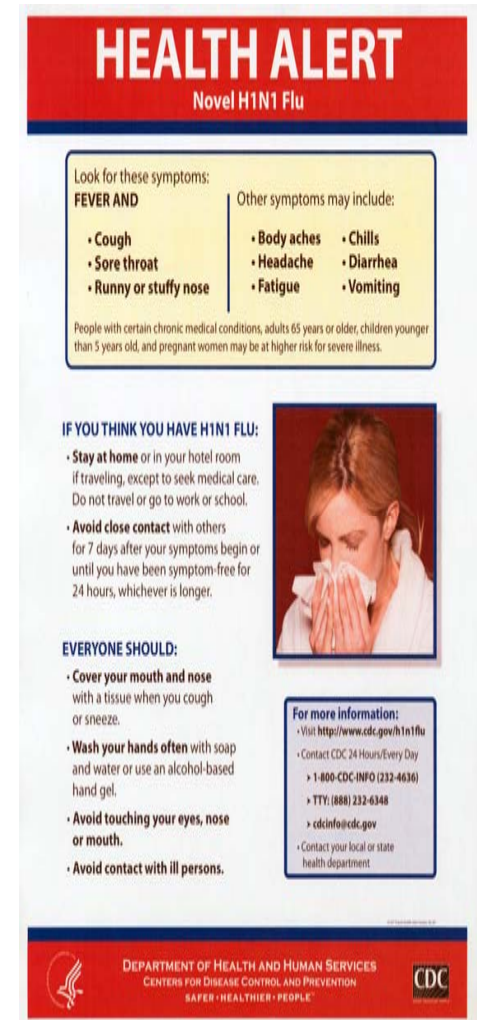
Save this card for 7 days and look for symptoms on the next page!

Today's date: _____

Keep this card until: _____

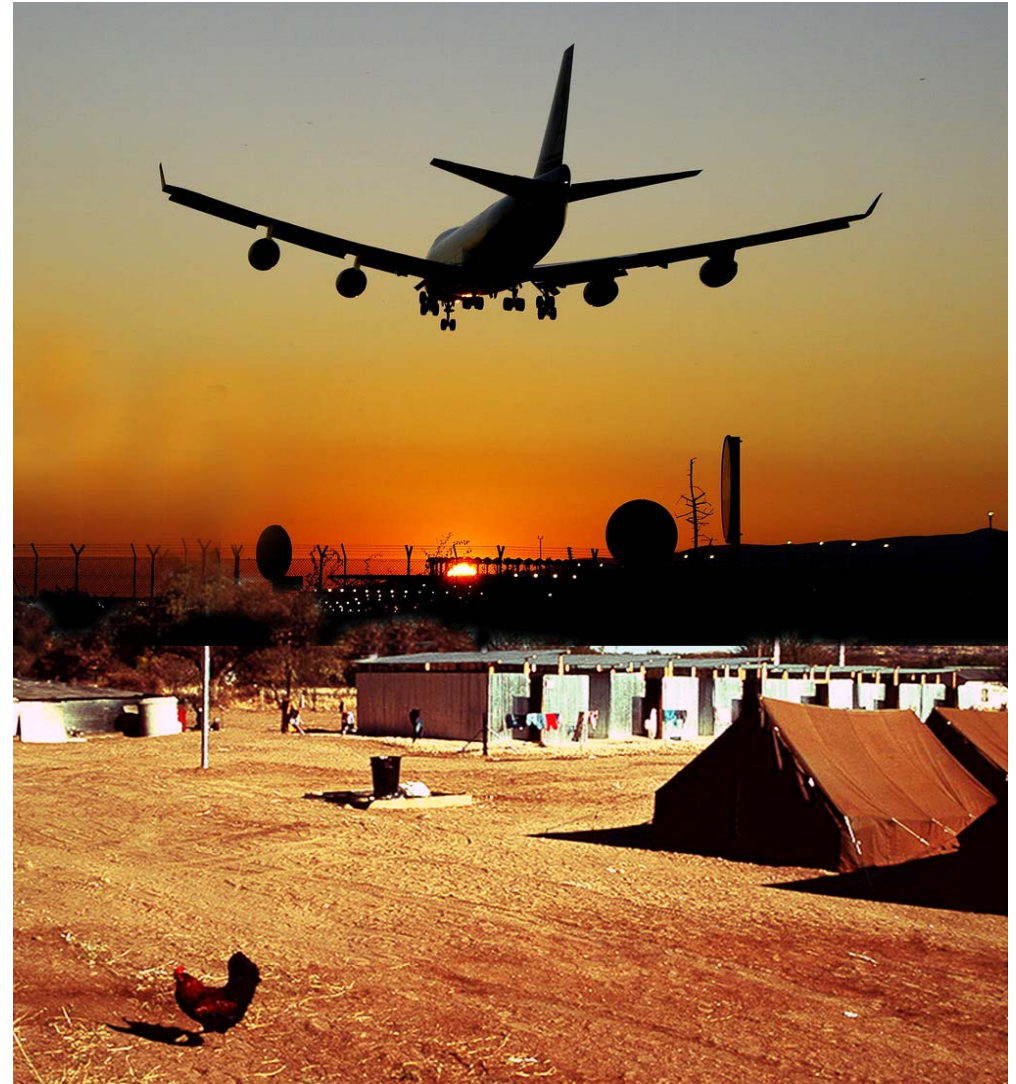


Swine Flu Travel Health Alert Notice
04-09
SAFER • HEALTHIER • PEOPLE™



Quarantine

Within / next to
the **airport** —
recommended by media



Quarantine

- In hotels: HKG

Health workers transit materials to Metropark Hotel where a guest was confirmed to be the first case of H1N1 in the Wanchai district.



Hotel residents wait for release from quarantine at the Metropark Hotel where they were held for a week in Hong Kong Friday, May 8, 2009.

Exit screening — Mexico only

- Health questionnaire
- Visual check
- Temperature check
- Spitting test (?!)



We are facing a new strain of flu virus which constitutes a possible outbreak.



We ask you to please answer this survey which will help you find out if you are sick.



NAME

AGE

GENDER M F

Do you have the following symptoms:

	YES	NO
Fever higher than 39° C	<input type="checkbox"/>	<input type="checkbox"/>
Cough	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Headache	<input type="checkbox"/>	<input type="checkbox"/>
Limb pain	<input type="checkbox"/>	<input type="checkbox"/>
Joint pain	<input type="checkbox"/>	<input type="checkbox"/>
Eye redness	<input type="checkbox"/>	<input type="checkbox"/>
Nasal flux	<input type="checkbox"/>	<input type="checkbox"/>

If you have all of these symptoms we recommend you to postpone your trip and visit a doctor.

Examination and tests on arrival

PART V — PUBLIC HEALTH MEASURES

Article 31 Health measures relating to entry of travellers

1. Invasive medical examination, ... shall not be required as a condition of entry of any traveller to the territory of a State Party

„invasive“ means the **puncture / incision of the skin** or insertion of an instrument or foreign material into the body or the examination of a body cavity. For the purposes of these Regulations, **medical examination of the ear, nose and mouth, temperature assessment using an ear, oral or cutaneous thermometer, or thermal imaging**; medical inspection; auscultation; ... external collection of ... saliva samples; ... shall be considered to be **non-invasive**;

Swabs? Time until results are available?



Occupational health problems

● Staff

- Handwashing
- Cough etiquette
- Stay home if sick
- Masks
- WHO: guidance 3 May

at airports

OK
OK
OK
surgical if <1 m

cabin crews

OK
OK
OK
surgical if ill PAX
US: N95 (untrained)

● Passengers

With symptoms

isolate in room

separate 6 ft (?)

Conclusions on initial measures taken

- In **contrast** to WHO recommendations
- **No international coordination (Future NET)**
- National decisions driven by
 - Fear, emotion, media, politicians
 - Lack of Public Health concept
 - Many procedures **useless „alibi measures“**
- Useful **in initial phase** (evidence?):
E.g. Exit screening, report by crew, information, contact tracing

How to control a pandemic?

- Influenza A (H1N1) 2009 **containment at source impossible** in April as
 - already 2 or more continents with cases
 - asymptomatic contagious initial phase
- Adapted response: **WHO Phase 5:**
„implementation of the planned mitigation measures“ — *should be evidence based!*

<http://www.who.int/csr/disease/influenza/PIPGuidance09.pdf>, Khan K et al. NEJM 2009

What could authorities contribute?

- Who is in charge? WHO? IATA? States!
- Avoid confusion / contradiction
 - Between States
 - Within a single State
- Improve **coordination** at least within region
 - All hubs same procedures (roads / railways / ports?)
 - Identical occupational health recommendations, e.g. masks
- Strategy: pragmatism vs. (idealistic) purism
 - Consider feasibility
 - Avoid to be driven by purely political arguments, or the media.

Pandemic H1N1 and the 2009 hajj

- Usually 2.5 million pilgrims from 160 countries
- KSA / WHO consultation to mitigate effects of pandemic
 - During hajj **end of November 2009**
 - By returning pilgrims
 - Particularly to resource-poor countries



Recommendations for 2009 hajj

- High risk groups **voluntarily refrain** from hajj
 - Pregnant women, chronic disease
 - Age <12y or >65y (25% senior pilgrims!)
- Thermal screening > isolation if ILI
- Non-pharmaceutical options
 - Washing required before 5 prayers (soap)
 - Hand sanitizers **with alcohol permitted**
 - **Cough etiquette**, but no face masks

Pharmaceutical recommendations for hajj 2009

- Monovalent pandemic H1N1 vaccine
 - not available in all countries \geq 2 weeks pre-departure
 - proof of vaccination required from countries with supplies in time to receive a hajj visa
- Antivirals
 - no routine chemoprophylaxis recommended
 - treatment a.s.a.p. for
 - all hospitalized persons
 - outpatients in high-risk groups

Ebrahim SH et al. *Science* 2009;326:938-40

Khan K et al. *J Travel Med* 2010;17 (in press)



Hajj 2009 — what happened?

- Pilgrims 1.6 million
- Vaccination rates
 - Seasonal influenza 40%
 - H1N1 influenza 10%
- H1N1 infections
 - confirmed cases 73
 - **deaths** **5**

Travel health recommendations in an influenza pandemic (1)

- WHO: no travel restrictions
- Travel health professional: follow national guidelines for in- & outbound customers
- Surveillance networks: limited function now, except
 - H1N1 2009 mutations
 - Antiviral resistance
- „Experts“: be ready to answer questions
 - To health authorities: national, regional
 - To media (base on evidence, basic PH rules)

Travel health recommendations in an influenza pandemic (2)

Non-pharmaceutical measures

- Individuals who **are ill should delay travel plans**
- Travelers who **fall (severely) ill should seek appropriate medical care**
- Social distancing: **where feasible**
- Worldwide propagated hygiene measures



Wash hands thoroughly with soap frequently



Cover coughs and sneezes



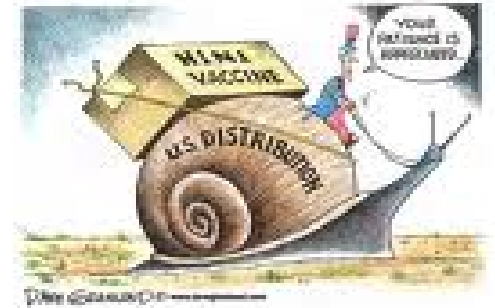
Wear a mask if symptomatic



Don't spit!

Travel health recommendations in an influenza pandemic (3)

Monovalent H1N1 vaccines



- Available vaccines

- Adjuvanted (MF59, AS03, etc) vs. Non-adjuvanted (USA)
- Split / subunit vs. Whole-cell
- Intramuscular (inactivated) vs. Intranasal (live)
- Produced on chicken-egg vs. on cell-culture

- Indicated from 6 months, including pregnancy

- Experience to date

- > 100 million, over 50,000 in pregnant women
- > 50 million with MF59 (oil-in-water, for > 10 years)

Travel health recommendations in an influenza pandemic (4)

Indication of H1N1 vaccines

- Often as per **national recommendations**
- In travelers particularly recommend / consider
 - **High risk groups and their travel companions:**
 - Age: very low, senior travelers from 50y (USA), 60/65y
 - Co-morbidity: particularly cardiopulmonary, immunological
 - Medical tourists
 - **High risk settings:**
 - Captive setting: Cruise ship, camp, sports mass gathering, tour group, crews
 - Occupational: medical, multiple contacts, incl. hotel staff
 - **All who request maximum protection**
- **Contraindications: none**, except history of massive reaction

Marti F et al. Expert Rev Vaccines 2008;7:679-87



Travel health recommendations in an influenza pandemic (5)

The future seasonal vaccines

Recommended composition of influenza virus vaccines for use in the 2010 southern hemisphere influenza season:

It is recommended that vaccines for use in the 2010 influenza season (southern hemisphere winter) contain the following:

- an **A/California/7/2009 (H1N1)**-like virus;
- an A/Perth/16/2009 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus.

<http://www.who.int/csr/disease/influenza/recommendations2010south/en/index.html>

Composition of influenza virus vaccines for use in the 2009-2010 northern hemisphere:

- an A/Brisbane/59/2007 (H1N1)-like virus;
- an A/Brisbane/10/2007 (H3N2)-like virus;
- a B/Brisbane/60/2008-like virus.

Travel health recommendations in an influenza pandemic (5)

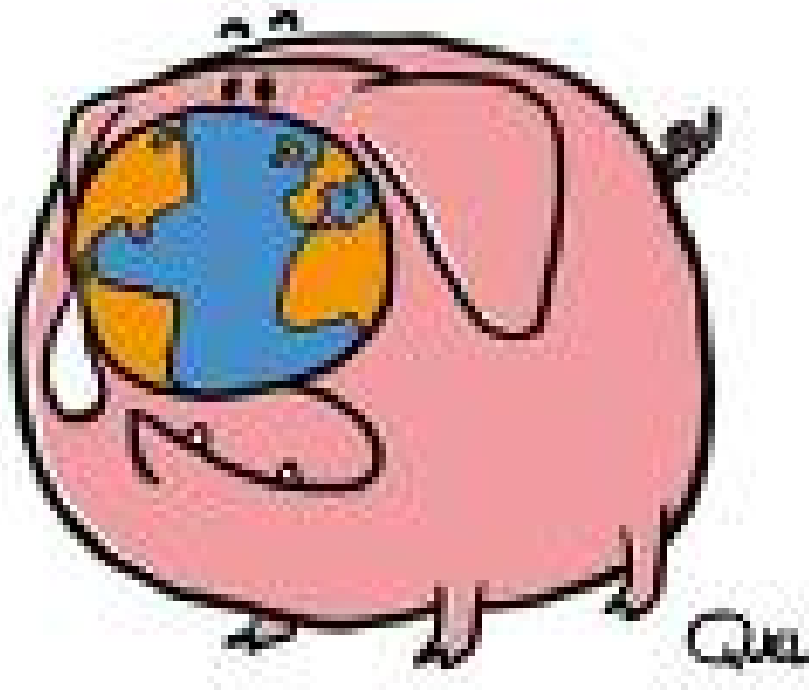
Antivirals

- Often as per **national recommendations**
- Stand-by emergency treatment (**travel kit**) consider
 - **High risk groups and their travel companions:**
 - Unvaccinated
 - Co-morbidity: particularly cardiopulmonary, immunological
 - **High risk settings:**
 - Captive setting (?)
 - Occupational: medical, multiple contacts
- **Prophylaxis: unvaccinated short term with multiple contacts (VIP)**

Marti F et al. Expert Rev Vaccines 2008;7:679-87



Thank you!



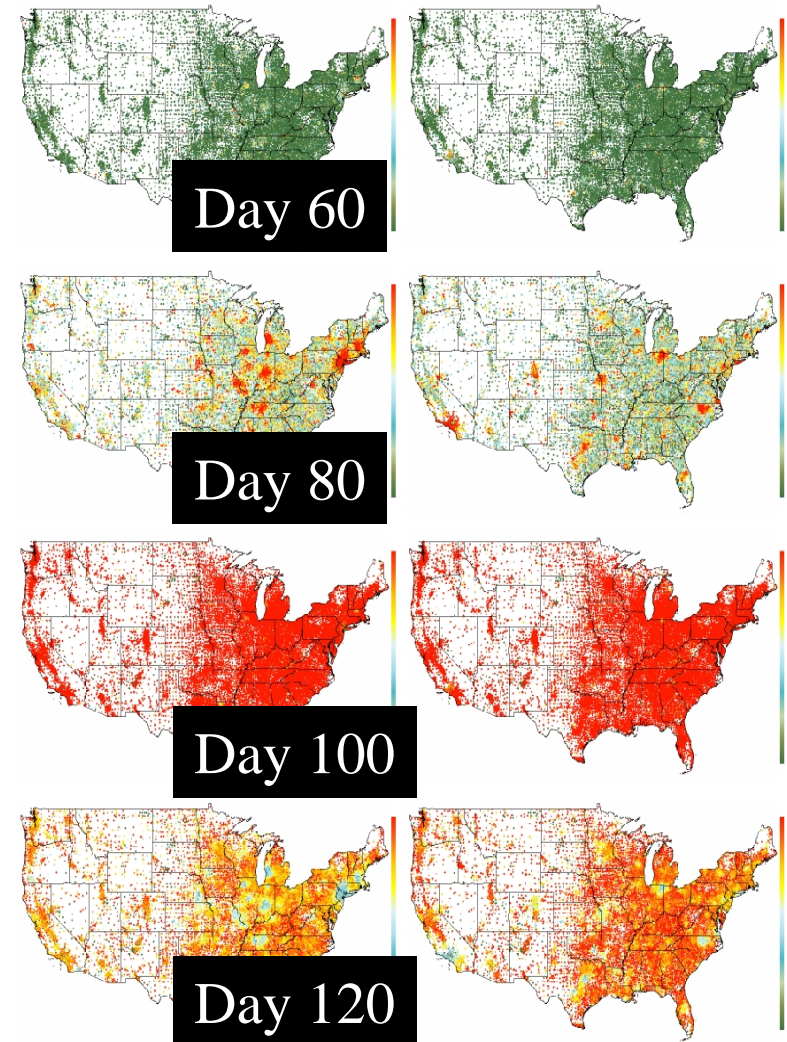
Conflict of Interest Declaration — Robert Steffen

RS has 2006 to 2009 accepted fee for education or advice from

- **Baxter**
- **Berna Biotech/Crucell**
- **GlaxoSmithKline**
- **Novartis Vaccines & Diagnostics**
- **Roche**
- **Sanofi Pasteur MSD**
- **SBL Vaccin**
- **World Health Organization.**

Travel restrictions and spread of pandemic influenza

- In a highly mobile population rapid imposition of 90% reduction in domestic travel would slow the virus spread by only a few days to weeks, and would not reduce the eventual number ill
- Travel restrictions at borders are unlikely to delay spread by more than 2-3 weeks unless more than 99% effective



Ferguson NM et al. Nature. 2006;442:448-52

Germann TC et al. Proc Nat Acad Sci USA 2006;103:5935-40

Hollingsworth TD et al. Nat Med 2006;12:497-9