Transmission of Infectious Disease on Aircraft

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Infectious Disease on Aircraft

- Known transmission
  - SARS
  - Tuberculosis
  - Meningitis
  - Viral gastroenteritis
  - Influenza
  - Food Poisoning
Infectious Disease on Aircraft

• Risk of Infection?
  – Type of organism and how infectious?
  – Type of passengers and how susceptible?
  – Method of Transmission?
  – Duration of Flight

• Prevention?

• Controls?
The Passengers

- Patterns of Travel
- Travel and Infectious Disease
- Older / Immunocompromised
Patterns of Travel

• Profile of Traveller
  – Holiday makers
  – Backpackers
  – Adventure holidays

• Method of Travel
  – Aircraft versus ship

• Numbers of Travellers
Tourist arrivals

Source: WTO 1999
Severe Adult Respiratory Syndrome

• What is SARS?
• What happened?
• Air Travel?
• Control Measures?
What is SARS?

- Late 2002, Guangdong Province, China
- Severe Viral Pneumonia
- Transmissible to Healthcare Workers and Household contacts
- Vietnam, Singapore, Thailand, HK, Canada, Taiwan and USA.
- March 2003 – Severe Acute Respiratory Syndrome (SARS)
- WHO – global control measures
Hospital Outbreaks

- Dr Carlo Urbani (Vietnam)
- Prince of Wales Hospital (HK)
- Toronto GH (Canada)
4 June 03 – UK Total of 4 cases (No deaths)
Prince of Wales Hospital, HK Mar 03

- Outbreak of 138 SARS cases
  - 112 secondary cases
  - 26 tertiary cases
- 69 HCW (20 doctors, 43 nurses, 15 allied)
- 16 medical students
- 53 other patients or relatives to same ward.
- All had close contact
- None had worn PPE
Cumulative Number of Suspected and Probable Cases of SARS and Deaths from SARS

Data are from the World Health Organization (WHO). Cases identified in China between November 16, 2002, and February 28, 2003, were added to the WHO total on March 26, 2003.
Clinical Features

- Fever (100%)
- Chills / Rigors (73%)
- Muscle pains (61%)
- Cough (57%)
- Headache (56%)
- Dizziness (43%)
- Sputum (29%)
- Sore Throat (23%)
- Vomiting (20%)
- Diarrhoea (20%)
Clinical Features – PWH, HK

- 23% admitted to ICU
- Mortality @ 3.6%
- All deaths had underlying disease
- No HCW deaths
Key Features

- Incubation period 2 – 11 days
- Highly transmissible
- Airborne and Blood / Body Fluid precautions
SARS Coronavirus EM

A

B
SARS Virus

- Coronavirus
- 90 – 140 nm dia
- New to humans
- Probable animal coronavirus
- Susceptible to standard disinfectants
Travel?
WHO Control Measures

• 15 Mar 03 – emergency travel advisory
  – Prevent international spread
  – Increase professional / public awareness
  – Increase surveillance

• 27 Mar 03 – travel update
  – Screening of passengers leaving affected area

• 2 Apr 03 – travel update
  – Advise non-essential travel to HK and Guangdong be postponed
Risk of SARS transmission on aircraft?

- 23 May 03 – 4 flights known
- 2 flights preceded 15 Mar 03 Travel Advisory
- **NO** aircraft related SARS cases since 23 Mar 03
Control measure pre-flight

- **WHO recommendations**
  - Any passengers / crew with symptoms postpone travel until fully recovered.
  - Exit screening measures
  - Contacts do not undertake air travel for 10 days.
Control measure In-flight

- Personal Hygiene
  - Wash hands frequently
  - Before eating!
  - Cover mouth / nose if sneezing or cough
  - Wash hands immediately
Control measure In-flight

• **Face masks**
  – SARS patients NOT infectious unless they have symptoms
  – NO routine use of face masks
  – But, if passenger develops symptoms
    • He must wear mask
    • Be isolated from other passengers
    • Dedicated toilet
    • Designated crew member with masks, gloves & Eye Protection
Control measure In-flight

- Captain must inform destination airport
- Contact details obtained for passenger and crew – 14 days
- High risk –
  - all same seat row,
  - 2 rows in front and behind,
  - all cabin crew
- Well passengers allowed to continue journey
Control measure Post-flight

- Baggage / cargo handlers – NO evidence
- Disinfection of aircraft
  - Cleaning and disinfection of “zone of risk”
  - Seats, headrests, table tops, handsets
  - Shared facilities
  - What disinfectant?
Forteantimes

it came from outer space...

WILD THEORIES, MASS PANICS, CURIOUS REMEDIES P32
Influenza on aircraft

- Alaska 1977
- Homer-Kodiak-Anchorage
- Index case
- 4 hour delay
- 22 secondary cases
Influenza 1999

- H5N1
- H9N2
- Cruise ships
- Neuramidase inhibitors
Fever hits troops in Afghanistan

Mystery bug hits troops in Kabul

British troops are less seriously ill as disease sweeps Afghan base

PLAGUED
Two British soldiers critically ill, 17 serious, 350 in quarantine as bug hits Afghan base

Mystery fever hits our boys in Kabul

EIGHTEEN British soldiers in Afghanistan have been struck down with a mystery fever.

The Ministry of Defence last night told The Guardian that the soldiers were in quarantine and that tests were being conducted to determine the cause of the outbreak.

Two "very seriously ill" British soldiers have been flown back from Afghanistan and 16 others are suffering from a bug that has caused seven deaths.

Bagram, said tests were still going on to determine what the disease was. Results were expected today.

We believe it's some kind of enteric (intestinal) fever, but we have yet to establish what it is, he said.

The Sun
16 May 2002
Mystery bug was winter vomiting – British expert

BRITAIN’S Defence Ministry said yesterday it had identified the mystery ailment that has laid low dozens of British troops in Afghanistan.

Officials told reporters it was “winter vomiting”, an illness characterised by one or two days of vomiting and diarrhoea.

“They have a virus infection identified as Norwalk-like virus. Now another name for this is winter vomiting disease, small round virus — SRV,” Wing Commander Andy Green, an infectious diseases consultant, said.

“It is not identical, virtually identical to the virus outbreaks that were causing problems in hospitals and the community in the United Kingdom,” he said. There were outbreaks of the condition in Britain last winter.

“These are highly transmissible agents, easily spread person to person in environments where you have a lot of people together, like hospitals, like field hospitals,” Wing Commander Green said.

“The incubation period is normally quite short, in the order of 24-36 hours, and in the United Kingdom produces an acute gastro-intestinal illness, vomiting, diarrhoea and recovery within 24-48 hours.”

Twenty-two British servicemen reported sick on Friday with the illness that struck a field hospital at Bagram Airbase near Kabul last week, taking to 40 the total number afflicted.

Wing Commander Green said the condition of two servicemen seriously ill with the condition had improved.

“The seriously ill patient in Birmingham is now out on the general ward and has minimal residual symptoms. The patient in Germany under the care of the Americans is also reported to be extremely well and no longer seriously ill,” he said.

Meanwhile, the United States army said yesterday that coalition warplanes had killed about 10 people in an operation against Islamic militants in eastern Afghanistan, but rejected reports that it had mistakenly attacked a wedding party.

A 1000-strong coalition force led by British Royal Marines has since surrounded the rugged Khost-Paktia region in a new operation dubbed Condor, aimed at hunting down suspected al Qaeda and Taliban militants in the area.

The private Afghan Islamic Press reported that US planes pounded the village of Bu Khil in Khost province for several hours on Thursday night after US helicopter crew mistook traditional firing at a wedding for an attack. — Reuters

Cases of Afghan bug soar to 138

THE number of hospital patients and staff hit by the same kind of vomiting bug which struck Royal Marines in Afghanistan soared from 90 to 138 yesterday.

A total of 78 patients and 60 staff at Whipps Cross Hospital in Leytonstone, East London, now have the virus, known as winter vomiting disease.

The first case was reported at the hospital a week ago. Two wards were declared infection-free yesterday, leaving 12 affected.
Vehicles of infection

- Fresh foods
- Commercial products
- Ships
- Aircraft?
Flight-related outbreaks

- Incubation period
- Travel-related disease?
- Passenger dispersal
- Presentation to doctors
- Passenger contact
- Commercial interests
“Highly infectious diseases”

- transmissible (by airborne route)
- significant morbidity & mortality
- treatment difficult
- no vaccine generally available
- potential for uncontrolled spread in community
Examples

• Viral Haemorrhagic Fevers (VHFs)
  – Lassa Fever, Ebola, Marburg, CCHF

• other viruses
  – smallpox, monkey pox, influenza, hantavirus

• other agents
  – plague, MDRTB
YOU'RE RIGHT.
IT IS WAVYING
BACK AT US!
Aircraft cabin air as a risk?

- No evidence of transmission by aerosol
- Recirculation
  - 10-20 changes per hour, HEPA filters, low humidity
- Close contact - droplets

... but can we ignore the risk?

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KILLER BUGS GRIP BRITAIN

Alert as health of thousands is put at risk

The look of love that says Kate will be Santa's bride
Summer in Toronto
Any Questions?