Follow-up of communicable diseases reported among travellers on aeroplanes

From time to time health departments will be notified of patients who have been diagnosed with a communicable disease and have travelled in an aeroplane while infectious.

The risk of transmission to fellow travellers will vary according to the disease, the infectiousness of the case, the mode of transmission, the ventilation in the aeroplane, the dose of the exposure (which depends on duration and proximity), and the susceptibility of the other travellers.

For airborne infections, the risk may extend beyond travellers and crew on the aeroplane, and include people *en route* to and from the airport, and workers and travellers at the airport.

Aeroplane travellers could carry a variety of infections. These include those that may be airborne (such as influenza, tuberculosis, measles, and chickenpox), those spread by droplets or exposure to nasopharyngeal secretions (such as pertussis and meningococcal disease), and those spread by hands or fomites (such as rhinoviruses, or enteric infections).

The risk of infection after exposure is highly variable. Some of these infections are more serious than others. They have incubation periods that vary from a few days to weeks and longer. For some, post exposure interventions to prevent the development of the infection are available. For some, knowledge of exposure may lead to early medical attention should symptoms develop.

Public health aims to prevent disease. However, priorities must be set in balancing the resources required to prevent potential disease against the burden that disease is likely to have on the community.

In determining whether the contacts of an infectious aeroplane traveller should be contacted about their possible exposures, the following parameters should be considered:

- the risk of transmission;
- severity of the disease;
- existing recommendations about prevention;
- whether passengers that are likely to have been exposed can be readily identified;
- availability of an intervention; and
- the ability to trace other passengers in time to deliver an intervention.

The data available to guide when passengers should be contacted are patchy. There is some evidence that tuberculosis may be transmitted on long flights,[1] and the World Health Organization recommends that where a person with infectious tuberculosis has travelled on a commercial flight of more than eight hours duration in the previous three months, the airline company should inform others who were seated in the same cabin area as the infectious case, of the risk.[2] The US Centers for Disease Control and Prevention found no reports of secondary transmission of meningococcal disease among airline contacts[3] but nonetheless recommended that for flights of more than 8 hours, chemoprophylaxis be given to passengers in the seats directly beside a case. Subsequently, two passengers who travelled in different sections of the same aeroplane from Los Angeles to Sydney have been reported with serogroup B meningococcal disease in 2003.[4] Nonetheless, transmission of meningococcal infections between passengers remains very rare.

The Table provides an arbitrary summary of these parameters for selected diseases. It is likely that follow-up may only be worthwhile for those aeroplane passengers who have been seated in the same cabin area as a passenger diagnosed with infectious tuberculosis for more than eight hours or in the seats immediately next to a patient with meningococcal disease for more than eight hours. The value of following up contacts of other cases seems limited, except in the case of serious exotic diseases such as pneumonic plague or viral haemorrhagic fevers. These would need to be dealt with on a case-by-case basis.

Where significant exposures to an infectious disease have been identified among aeroplane travellers, then, depending on the risk to the travellers, options for alerting them may include public health workers contacting them directly, airline officials relaying messages, or issuing alerts through the news media.

It is important to prevent infections among travellers on aeroplanes from occurring in the first place. Potential travellers should:

1. seek medical clearance from a doctor before travelling if they have a fever with respiratory symptoms, or vomiting and diarrhoea;

2. ensure that they are immune to measles, mumps and rubella (i.e. all travellers older than one year and born since 1966 should have received two doses of measles, mumps and rubella vaccine, unless contraindicated);

3. check that they are protected from chickenpox, influenza and pertussis if they wish to avoid these infections (see the current edition of the *Australian Immunisation Handbook* for recommendations, available from http://immunise.health.gov.au/handbook.htm);

4. follow simple hygiene measures to minimise the spread of infections: covering coughs and sneezes with a disposable tissue, and wash hands with running water and soap regularly, especially after blowing the nose or using the toilet. Airlines may provide passengers who are coughing with a mask.

Note: Recommendations for following up contacts of passengers with measles are still under consideration by the communicable Diseases Network Australia. In recent years, transmission of measles on aeroplanes has rarely been documented.

References

1. Miller MA, Valway S, Onorato IM. Tuberculosis risk after exposure on airplanes. *Tuber Lung Dis* 1996;77:414-419.

2. World Health Organization. Tuberculosis and air travel: guideline for prevention and control. Geneva, Switzerland; World Health Organization, 1998.

3. Centers for Disease Control and Prevention. Exposure to patients with meningococcal disease on aircraft—United States, 1999-2001. *MMWR Morb Mortal Wkly Rep* 2001;50:485-489.

4. NSW Health Department. Meningococcal disease cluster on an aeroplane. *N S W Public Health Bull* 2003;14:153-154

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Table. Should contacts of an infectious aeroplane traveller be contacted about their possible exposures to infectious diseases?

Parameter	Human influenza	Tuberculosis	Chickenpox	Meningococcal disease
Risk of infection	High	Moderate if smear positive case exposed >8 hours	Low among most adult travellers because of childhood infections	Low
Usual severity	Mild/variable	High	Low/variable	High
Existing recommendations for general population	Immunise if at risk of severe illness	No	Some	Early detection of symptoms and treatment
Passengers likely exposed to infection?	Whole plane	Adjacent seats	Whole plane	Adjacent seats
Post exposure prophylaxis available	Antiviral drugs	Screening, preventive therapy	Immunisation or varicella-zoster immunoglobin	Specific antibiotics
Trace travellers?	No	Seats in the same cabin area, if flight >8 hours	No	Seat beside if flight >8 hours

Parameter	Pertussis	Enteric infections	Quarantinable diseases
Risk of infection	Unclear: probably moderate if >8 hours flight	Low (few case reports), probably moderate for norovirus	Variable
Usual severity	Mild/variable	Variable	Variable
Existing recommendations for general population	Vaccination for children and some adults	Hand-washing	Variable
Passengers likely exposed to infection?	Adjacent seats	Variable/toilet users	Variable
Post exposure prophylaxis available	Specific antibiotics	No	Variable
Trace travellers?	No	Not usually	Yes for viral haemorrhagic fevers, plague