– Aircraft Disinfection –

Not Quite As Simple

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Given by

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Aircraft Disinfection
This won’t really work!

Germs can’t be ...
heard, smelled, seen or tasted ...
.. which makes them rather hard to identify!

The 4 Virus Busters
Infection and Environmental Hygiene Group Declares War on Germs

The Infection Protection Magazine
EUR 4.45, January 2002

Anti-Germ Squad
Safety Package
The Department of Health of Erding District Council with their special equipment – page 4

Sniffing out Deadly Bacteria – page 13

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Aircraft Disinfection

Background

At the time, both active and passive passenger information was distributed at airports, e.g. on SARS (Severe Acute Respiratory Syndrome).

Passive information:
Supplied at info stands etc.

Active information:
For departing passengers through airline staff during the check-in procedure, and for arriving passengers by the German border police (Bundesgrenzschutz, BGS)

Moreover, as far as we are aware, all airlines had to refuse to carry any passengers who were coming from SARS areas and who were showing SARS symptoms.
Aircraft Disinfection

Background 2

There had to be a guarantee that the following materials could be distributed as specified by the Health Department.

(1) For all passengers (if they had not received these details at the departure airport): “Important health information from the Robert Koch Institute (the central institution of the German Ministry for Health and Society Security in matters of infectious diseases) for air passengers”

(2) For passengers seated within a 2-metre radius of an infected passenger and for the crew looking after the patient: information sheet “Important information for contact persons of suspected SARS cases”

(3) For passengers seated within a 2-metre radius of an infected passenger and for the crew looking after the patient: exit tickets, possibly face mask and disposable gloves.
Aircraft Disinfection
Possible Alarm Procedure

Possible flow of information

1. Sick patient reports to crew
2. Crew to pilot
3. Pilot to tower
4. Tower to Ground Handling Centre
5. Tower to dispatch centres
6. Dispatch centres activate emergency schedule
7. Function units at airport, authorities & organizations with security functions and other airport services
8. Dispatch centre contacts the relevant health authority by phone
Aircraft Disinfection
Possible Procedure 1

Flight staff:
Ask if there are doctors on board and request help with the following measures:

Get the affected passenger to put on a surgical face mask, provided he or she can still breathe with it.

If the passenger has breathing problems, oxygen needs to be supplied. If at all possible, he or she should be isolated on board, i.e. the passenger should be placed as far as possible from other passengers, or the immediate environment should be evacuated.

If the sick passenger displays symptoms such as severe coughing, face masks should also be worn by any passengers within a radius of about 2 metres as well as by stewards looking after the passenger.
Record the following details for later communication to the destination airport:

- Name
- Date of birth
- Symptoms (high fever, violent shivering, muscular pain, coughing, etc.)
- Seat no.
- Countries where the patient has been within the last 10 days

Tell the sick passenger and calm down other passengers, pointing out that SARS is so far only an unconfirmed suspicion and that the necessary measures are being taken in coordination with the Medical Service at Munich Airport and with the Erding health authorities.
Aircraft Disinfection
Possible Procedure 3

Steward:
Info to Captain

Pilot:
Notifies tower at destination airport and gives them the relevant information gathered so far.

Airport:
Activate emergency schedule – authorities and organizations with security functions, incl. health authorities and other airport services

Park aircraft in remote position
(This is not to put everyone into quarantine but to avoid additional obstruction to airport operations and to ensure that the situation can be handled more efficiently. Passengers stay in their seats and wait for the bus. No one must leave the aircraft unchecked, etc.)
Aircraft Disinfection

Possible Procedure 4

Airport doctor enters the aircraft, wearing FFP face mask and two layers of Nitril gloves. After examining the patient, the definition of the case is reviewed with the available representative of the Health Department who takes charge the operational management of the case. If he or she suspects that the patient might have SARS, then a rapid influenza test is conducted by the airport doctor.

(If the rapid influenza test is positive, then this does not yet confirm SARS. In such a case, the airport doctor must still take a throat swab. The test needs to be confirmed via PRC Influenza at the Landesamt für Gesundheit und Lebensmittel-sicherheit (LGL, the State Office for Health and Food Safety).
Aircraft Disinfection
Possible Procedure 5

Next, everyone’s personal details (i.e. passengers and crew) are recorded at Muc II, as detailed on their disembarkation cards, so that all the details are available even if the PCR test at the LGL has been negative and so that appropriate action can be taken.

Why?
This is because the rapid tests can be falsely positive, which would definitely be fatal.

If the rapid test has been negative and the case has been defined as SARS under the relevant criteria, proceed as follows: any passengers and other persons who have been seated in the immediate environment of the patient (i.e. 2 rows in front of passenger, 2 behind and 2 on his/her left and right, or within a radius of ca. 2 metres) or who have had direct contact with the same must be recorded through disembarkation cards, marked separately as such and stay on board. They will be given separate information.

(See Handling of Contact Persons – RKI, further decisions are then made by the health authorities.)
Patient:
taken to hospital immediately (e.g. in an ambulance with its normal equipment removed or in a rescue service vehicle), for an X-ray. The hospital should generally be Schwabing.

Transportation is reported by the Health Department or the Communication Centre to the Rescue Service and to the hospital, and the matter is discussed with the infections consultant.

Patient and ambulance staff must wear face masks during transport. Patient: at least surgical mask, preferably FFP3 mask without valve. Ambulance staff: at least FFP3 mask, disposable gloves (Nitril) and possibly also anti-infection suits.

Depending on the patient’s state of health, there is no need for a doctor to accompany the patient on the way to hospital.
Possible Procedure 7

Other passengers: As regards all the other passengers, it can currently be assumed that they are not at an increased risk of attracting SARS. If the passenger has SARS, then he or she is likely to spread the germs via droplets. Spreading should therefore be prevented through the use of face masks.

Droplets of this kind can only stay in the air for a brief period, so that they are only hazardous for people in their immediate vicinity (about 2 metres). It is therefore sufficient to record the personal details of passengers on board, using disembarkation cards.

The passengers are asked to take their temperatures once a day for ten days and to see their doctors as soon as they have a fever.

In addition, they are also given information leaflets. Passengers are released and asked to follow the instructions specified in the leaflets. (See Handling of Contact Persons – RKI).
Aircraft Disinfection
Possible Procedure 8

Management of the aircraft:
Aircraft to be cleaned and re-used.
The airline must ensure that the seat and any hand contact surface (e.g. the armrests and the foldable table, etc.) as well as the toilet which the passenger may have used (including door handles, toilet paper dispensers, water tap, etc.) are disinfected with wipes containing aldehyden, peracetic acid, oxygen separator or some other compound recommended by the Department of Health.

As soon as the aircraft has been cleared by the health authority, it can be used without restrictions again.

Muc II:
The Airport Fire Service and the Erding Health Department have already collaborated on disinfection activities at the request of the airlines.

The Health Department notifies the ministries and the district council or the mayor, and the ministry notifies the government.
Aircraft Disinfection

Overview

Flowchart on a suspected SARS case in a aircraft arriving in Germany from a SARS country

Situation
(1) Passenger complains about high temperature and cough or breathing problems.
(2) A passenger shows signs of fever and a cough or breathing problems.

Steward
Asks passenger to put on a surgical face mask.
If possible, isolates passenger on board.
If symptoms are severe or if there is lack of compliance, asks neighbouring passengers to wear face masks, too
Reports to pilot: (1) name of passenger, (2) DOB, (3) Seat no., (4) countries visited in last 10 days, (5) symptoms
Provides information and calms down sick passenger and possibly any other passengers.

Pilot
Notifies ground staff.

Ground staff
Notify airport doctor, who then notifies Department of Health.

Airport Medical Service
Enter aircraft, wearing FFP3 masks, disposable gloves, "General Info for Passengers" and "Info for Passengers Who May Have Been Exposed to the SARS Virus"

Steward
Steward
Steward
Steward
Steward

Pilot
Notifies ground staff.

Ground staff
Notify airport doctor, who then notifies Department of Health.

Airport Medical Service
Enter aircraft, wearing FFP3 masks, disposable gloves, "General Info for Passengers" and "Info for Passengers Who May Have Been Exposed to the SARS Virus"

Airport Medical Service and crew
Passengers 1 and 2 rows in front/behind sick passenger stay on board. Other passengers can leave upon receiving info.

Airport Medical Service and crew
Passengers outside 2-metre radius of patient can leave upon receiving information.

Steward
Steward
Steward
Steward
Steward

Airport Medical Service and crew
Passengers within 2-metre radius of patient and crew looking after patient complete and hand in disembarkation card and are then free to leave.

Airport Medical Service
At airport or hospital: record personal details of patient; clarify definition of case or exclude causes other than SARS (e.g., flu)

Airport Medical Service
No suspicion of SARS: patient can leave.

Airport Medical Service
Patient requires treatment for non-SARS sickness.

Suspicion of SARS.

Immediate thoracic X-ray; face mask for patient and nursing staff; doctor to accompany if medically required.

Further measures, as instructed by Dept. of Health.
Let’s have a break!

To be continued in 5 minutes...
The following illustrations (slides 16-19) are from a presentation by Martin Dechow EADS Airbus.
Aircraft Disinfection

There is a wide variety of aircraft categories. They can be distinguished, among other things, by...

- the type and size of the category,
- the number of seats, etc.
Aircraft Disinfection

Ventilation Systems

There are different ventilation systems in aircraft, for instance …

flowing from the top (right/left).

The outgoing air (right/left) is fed back into the ventilation system of the aircraft at the bottom.

As a result, the circulation of the air is literally circular.
Suitable HEPA filters can keep out viruses and bacteria at a rate of nearly 99.99%.
Aircraft Disinfection

What kind of disinfection should be conducted?

Continuous disinfection?
Wiping?
Scrubbing?
Final disinfection?
Room disinfection?
Hand contact only?
2 or 4 rows in front of and behind the patient?
The entire aircraft?
The entire aircraft and the air within it?
Explosion hazard?
Aircraft Disinfection

What other questions will you need to answer?

What should be disinfected?
- Cloth, leather
- or other materials?

Action time of disinfectant?

Compatibility, toxicity?

Detrimental effect on aircraft or on aircraft equipment?

Which germs?

Is it mandatory?

Who is authorized to disinfect?
Aircraft Disinfection

Spoilt for Choice?

For viruses or bacteria?

A large number of efficient disinfectants are available (lists: RKI, DGHM)

Some of these are also suitable for decontamination!

Aldehydes, peracetic acid, oxygen separators, etc.....
Aircraft Disinfection

Spoilt for Choice?

But what about sporogenic substances?
This is more difficult!

During the anthrax scare, the Bavarian authorities in Germany recommended:

Oxygen-active compounds such as “Dismozon Pur”
Peracetic acid, e.g. Wofasteril which has been used in veterinary medicine for many years and requires a minimum of time to take effect. Also fully usable in alkalized form.
Aircraft Disinfection

Conclusion No. 1

Disinfection activities are always difficult in an aircraft!

The disinfectant and the relevant measures should always be conducted in coordination between the airline and the relevant health authority.

The airline should have the relevant product in stock for its aircraft!

The disinfectant should be one that is listed by RKI and DGHM (if disinfection takes place upon instruction, then the RKI list should be the authoritative one)!

After disinfecting, it may be necessary to have the aircraft serviced, if necessary, to remove any damage that might have occurred!

In this context it is also important to remember the filtering of the ventilation system and – when dismantling the filter – to remember suitable staff protection (e.g. protective suits, two layers of Nitril gloves, gloves for mechanical strain, full face maks with ABEK2 P3 filters and a suitable disinfectant).
In the vast majority of cases, however, it is sufficient to disinfect any hand contact surfaces (e.g. backs of seats, arm rests, toilet handles, door handles, etc.) in aircraft, if a suitable ventilation system is in place.

Generally speaking, under current estimates, the danger of infection in an aircraft is no greater than in other crowded places (such as buses, underground, trains, cinemas, swimming pools, etc.).

Considerations are in progress whether UV germicidal irradiation or considerably longer disinfection periods (3 days) might be suitable as room disinfection measures for highly infectious germs (viruses). However, even if this is done, it will still be necessary to scrub and wipe.
Aircraft Disinfection

Interesting links on the subject

INTERDISCIPLINARY NETWORK OF EXPERTS BIOLOGICAL HAZARD SITUATIONS

www.bevoelkerungsschutz.de

If you are interested in joining this network, please write to the following e-mail address, with details of your name, your job (position) and your unit:

Email: org@bevoelkerungsschutz.de

EUROPEAN AVIATION GROUP FOR OCCUPATIONAL SAFETY AND HEALTH

http://www.eagosh.com

Robert Koch Institute
http://www.rki.de

EnviroSystems, Inc
http://www.ecotru.com
Aircraft Disinfection

And finally…

Remember than personal protection equipment is indispensable when conducting disinfection measures or when treating infected patients!

Feel free to ask any questions you may have at this stage …

or just give me a ring at some other time:  +49(0)8122 58-1440

Thank you for your kind attention.