Ladies and gentlemen, you are about to be sprayed.

AIRCRAFT DISINSECTION

What has been, what is, and where to go from here.
"Concerned passenger" emails to eight airline representatives

- Described as "knowledgeable" on DOT website
- Emailed eight airlines as "concerned passenger"
- Six of eight airlines didn't respond
- One assured safety "the chemicals used are approved…and safe for the public"
- Other simply confirmed that flights to India are sprayed in-flight
Aircraft disinsection

In contrast...

- AFA collected reports on more than 200 flights in one year (2000-2001)
- Have collected information on complaints and/or lawsuits on airlines in US, Canada, UK, and Australia
- Can also be serious aviation safety hazard.
Aircraft disinsection

Outline of presentation

• How are the sprays applied?
• What's in the sprays?
• Why do countries require spraying?
• What is the documented impact on health?
• What about aviation safety?
• What rules are there to control exposure?
• What needs to be done?
Application method #1
In-flight spraying

- ALL FLIGHTS: Grenada, India, Kiribati, Madagascar, Trinidad/Tobago, Uruguay

- SELECTED FLIGHTS: Brazil, Czech Republic, Indonesia, South Africa, Switzerland, UK
  - Sometimes sprayed on the ground upon arrival
  - Sometimes sprayed upon departure ("blocks away")
  - No real choice or information
Application method #2
Residual spraying

• Accepted by Australia, Barbados, Fiji, Jamaica, New Zealand, Panama

• Sprayed before pax and crewmembers board

PHOTO COURTESY OF LINDA BONVIE, JOURNALIST
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What do they spray?

- **Active pesticide ingredient:** typically permethrin (residual) or phenothrin (in-flight)
- **Solvents:** (methylene chloride, benzene based chemicals, etc.)
- **Propellants:** CFCs or HFCs (in-flight spray)
- **Water** (residual spray)
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Or just spray with DDT instead?

• In 1985, WHO issued a standard formulation for aircraft insecticide
  – 3% DDT
  – 1.6% pyrethrum
  – 7.5% xylene
  – 2.9% petroleum distillates
  – 85% CFCs

• Still formally on the books, but countries do not report using it
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Spraying requirements are nothing new

• Australia passed Quarantine Act of 1908

• India issued in-flight spraying rules for all arriving aircraft in the 1930s to protect country from yellow fever
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Flights from the US pose any risk?

• *Conceivable* that aircraft arriving from certain areas of US could be potential risk
  – Reports of malaria in CA, dengue fever in TX
  – Mosquitoes that carry yellow fever in CA

• But did disease arrive via pax cabin of aircraft?
  – Cargo hold infestations well-documented
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Outstanding questions

• Do the sprays kill the bugs?

• Do the application methods in the cabin/cockpit minimize the exposure of the occupants?

• Are there other effective methods that don't involve chemical spraying in the cabin/cockpit?

• Is it necessary to treat ALL arriving aircraft, regardless of departure point/season?
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Govt. commissioned reports from Australia

• 1988: The Lindsay Review
"Disinsection is an excellent example of quarantine being applied in response to a general biological principle, with little or no attempt to assess the risk"

• 1996: The Nairn Review
"A recent review presents no evidence that exotic insect pests have entered Australia through aircraft … The Review Committee recommends that aircraft disinsection [of the cabin/cockpit] be discontinued."
Aircraft disinsection

Another example: INDIA

- No yellow fever in India

- Due to blanket disinsection requirements in cabin/cockpit?

- Shouldn't India accept and promote residual spraying with enforced control measures?

- Necessary to spray arriving aircraft from northern latitudes during winter months?
Aircraft disinsection

**INDIA - continued.**

- Needs V. CAREFUL consideration given serious impact of introducing yellow fever into India's billion-plus population

- BUT can't disregard health of aircraft occupants and mustn't ignore
  1. Available alternatives
  2. Conditions at northern latitudes during winter months
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History/examples of illness reports in US

• 1979 Centers for Disease Control (CDC) dropped routine spraying requirement on flights arriving in Hawaii

"The insecticidal formulations…currently used to disinsect aircraft cause undue discomfort to many passengers, and, in some cases, place those exposed at risk of developing acute allergic (anaphylactic) reaction…"
Aircraft disinsection

May 1994 – Congressional hearings

- Rep. Peter Defazio (OR), Senator Patrick Leahy (VT)
- EPA Office of Pesticide Programs referred to
  - "incidents in which airline personnel and pax reported symptoms [after in-flight pesticide treatment] that ranged from headaches and nausea to… seizures and memory loss…It is impossible to prevent dermal or inhalation exposures during an in-flight cabin infliction…"
Aircraft disinsection

Public health/medicine specialists

- US surgeon general spoke out against the practice of in-flight spraying in 1983
- In 2001, CA Department of Health Services recommended that aircraft disinsection, as currently practiced, be discontinued
  - Received many doctors' reports of pesticide-related illness
  - Currently conducting investigation – but
  - Slowed because airline won't let them on the plane
Aircraft disinsection

Attempt to provide pax "right to know"

- US DOT proposed rule in 1995
- Cited "numerous letters with complaints received by the EPA and DOT"
- Pointed out that the product "had been labeled to show that [it] can be sprayed in airliner cabins to disinsect the aircraft, but also warned that the product is hazardous to humans."
Aircraft disinsection

DOT dropped proposed rule in 1998

• Strong support from labor/passenger groups

• Strong resistance from airlines
  
  – "Requiring airlines and travel agencies to warn customers of potential health hazards is an unfair burden and could harm the public…”

• Dropped proposed rule in 1998 because of success in convincing some countries to drop/modify spraying requirements
Aircraft disinsection

EPA issues notice in 1996

- Would no longer approve pesticide products for use in occupied cabin unless the manufacturers could prove that the products were "safe" for that use
- Cited health concerns
- No manufacturer responded to "raised bar" so no products approved for use in occupied cabin
Aircraft disinsection

Unfortunate upshot of regulation

- Same/similar products still applied in occupied cabins, just not in US.


- EPA does approve the same product for killing cockroaches (Black Knight Roach Exterminator).
Aircraft disinsection

Documented impact on health and safety

- Noted increase in pesticide-related calls, distributed standardized form to members who fly Austr/NZ

- August 2000 – July 2001, received reports on 230 flights, single airline
  - Flight attendants
  - Pilots
  - Passengers
Aircraft disinsection

Types of reports?

- Most referenced conditions and symptoms
- During/after flying freshly-treated aircraft
- During/after in-flight treatment
- Many reports cited odor in cabin, some reported damp/wet surfaces
- Problem especially bad in crew bunk beds
Aircraft disinsection

Symptoms reported

• Most common
  – Serious sinus problems
  – Swollen and itchy eyes
  – Skin rash/hives (variable intensity)
  – Loss of voice
  – Difficulty breathing

• Less common, more serious
  – Difficulty concentrating/memory problems
  – Neuropathy
  – Unusual fatigue, blood cell disorders
Aircraft disinsection

Problems not just reported at one airline

- Aware of reports of ill-health that resulted in lawsuits being filed against another US airline and an Australian airline

- Ill-health reported to CDC, DOT, EPA

- Canadian flight attendants report symptoms associated with in-flight spraying – want masks/gloves

- Passengers and flight attendants report symptoms in UK – flight attendants want masks/gloves
Aircraft disinsection

Severe implications for aviation safety

- Flight attendants have reported eyes too swollen to read pax manifest, voice too hoarse to shout if necessary

- After spending time in recently-treated bunk room, pilot reported rash, problems swallowing and breathing, confusion, "making mistakes"
Aircraft disinsection

But aren't the sprays "safe"?

• WHO does claim "safety" but also
  – "allergic and other unfavorable reactions" (1984)
  – "small number of clinical conditions" (1995)
  – Anecdotal reports of pulmonary symptoms (1995)
  – Not ONE SINGLE study of chronic/acute health effects on commercial aircraft
Aircraft disinsection

Toxicity also a riddle at the airlines

- "cabin is about to be treated with a non-toxic spray"

- "stating that the spray is non-toxic is not entirely correct"

- "may be individuals with increased susceptibility who will not be protected"
Explanations for differences in reporting frequency?

- Difference standards/procedures at different airlines?
  - Different quantity of in-flight spray applied?
  - Different standards for re-entry after residual spraying?
  - Different procedures for spraying bunks?
"Sensitization…with successive pesticide exposures, may be a problem faced by cabin attendants …[and] is ideal for inducing sensitization or magnified responses to the same exposures."
Aircraft disinsection

**Individual differences in metabolism?**

- Certain conditions increase susceptibility - immune disease, developing baby, infants, children (Naumann & McLachlan, 1999)

- Key enzyme that the body uses to break down pesticide can be inhibited by ingredient in sprays (NRC 2002)
Well-intended international standards to limit exposure

• For example, ICAO requires that
  – "Contracting states shall ensure that their procedures for disinsecting or any other remedial measure are not injurious to the health of passengers and crew and cause the minimum of discomfort to them."

• But no enforcement mechanism
What needs to be done

Review the need to treat ALL flights

- Countries need to review their spraying requirements and consider whether certain combinations of departure points/seasons do not need to be sprayed

- Airlines may need to review and modify routing schedules
What needs to be done

Appropriate/alternative application

• Review whether application methods are appropriate

• Are there other methods which are as or more effective?
  – "integrated pest management" – e.g., use of sodium vapor lights in aircraft at night, sterile insect release programs, insect trapping programs, etc.
What needs to be done

Exposure control measures

• Need to develop and enforce exposure control measures for residual treatment
  • Treat mattresses/bedding off the aircraft and leave until fully dry
  • Proper ventilation post-residual spraying
  • Reduce portion of fleet that is sprayed.
Questions?