Bugs on board: Answers to frequently asked questions

April 2016

Goal is to prevent the transport of bugs of board without damaging the health of crew/passengers

Judith Anderson, MSc CIH
Industrial Hygienist
AFA-CWA, AFL-CIO

What is aircraft disinsection?

Aircraft disinsection is the process of spraying pesticide products in the cabin and flight deck, either prior to boarding or inflight. It is intended to prevent the transfer of flying insects that could damage public, plant, or agricultural health. Currently, approximately 50 countries require aircraft disinsection, whether on all or selected flights. Most countries require that the crew, passengers, and cabin is sprayed, typically either at “top of descent” or after arriving at the gate, with a solution containing 2% d-phenothrin. Some countries allow “residual treatment” in which the unoccupied cabin and flight deck are liberally sprayed with a solution containing 2% permethrin. Both d-phenothrin and permethrin are pyrethroid insecticides.

Does aircraft disinsection work?

Spraying pyrethroid insecticides on aircraft is formally recommended by the World Health Organization (WHO) and all countries with spraying rules follow the WHO guidance. However, it is not clear to what degree current spraying methods reliably kill insects onboard. Also, passengers and crew have documented ill health during/after flying on a sprayed aircraft since the 1970s, so even if chemical disinsection works, it comes at a cost.

Does the US require that incoming flights are sprayed?

The US has not required routine disinsection (i.e., application of pesticide products, either inflight or prior to boarding) on incoming flights since 1975. When the spraying ban took effect at that time, the stated rationale was that the sprays were eliciting some acute and sometimes life-threatening symptoms amongst aircraft occupants, and there was insufficient evidence that the sprays were effective. In 1995, a number of countries with spraying rules that received direct flights from the US (including Mexico) also dropped their disinsection rules.

Is aircraft disinsection necessary?

It makes good sense to prevent the transport of bugs that carry vector-borne disease via the aircraft cabin. However, as described above, there is little evidence that aircraft disinsection works. Further,
there is no evidence that spraying insecticides onboard is either the best or the only approach to preventing the transport of bugs on board. This matters because there is clear evidence that onboard exposure to disinsectants in an enclosed space can cause acute symptoms, such as rashes and respiratory symptoms. There is also evidence, based on reports from crewmembers, of chronic respiratory and neurological illness, associated with chronic onboard exposure. Passengers are not informed of spraying rules prior to ticket purchase, despite a 2012 law which grants that “right to know.” Further, an aircraft could be residually treated in preparation for being routed to a country with spraying rules, but in the meantime, operate to countries without any spraying rules. For this reason, even if passengers were informed about inflight spraying, they may unwittingly find themselves flying on a treated aircraft with pesticide-dampened seats and carpets, all depending on when and where their aircraft was sprayed and where it may be routed on future flights.

Why does all of this matter now?

Aircraft disinsection is an outdated process that has long been in need of rethinking. On any other mode of transportation, it would be unacceptable to spray people with pesticides without their consent and without forewarning. The recent rise and spread of vector-borne diseases such as Dengue fever and the Zika virus may put airline passengers and crew at risk of unnecessary exposure to pesticides on aircraft.

Why is chemical disinsection a bad idea?

Spraying people with pesticides in an enclosed space with no warning and limited (if any) quality control is clearly a bad idea. Aircraft are enclosed and poorly-ventilated spaces with little dilution volume and no options for egress. This practice would be deemed totally unacceptable on any other mode of transportation. It should be deemed unacceptable on aircraft, too.

It is also clear that some of the spraying rules are illogical. For example, India requires disinsection on all arriving flights. This regulation is ostensibly intended to prevent the introduction of yellow fever, but the requirement covers all flights, not just those that have been in endemic areas.

Does the US currently require spraying on incoming flights?

The short answer is “no.” The longer answer is that, in 1975, the US Centers for Disease Control announced that, while it still reserves the right to spray, it stopped requiring routine disinsection on incoming flights. The agency cited evidence that the sprays were making some people sick, and there was insufficient evidence that the sprays were effective.

The US is subject to the spraying rules of other countries, though. The number of countries that require spraying on flights arriving from the US shrank in 1995 after the DOT proposed a regulation that would have mandated passenger notification of spraying rules prior to ticket purchase. In response to that proposed rule, Mexico and some other countries, dropped their spraying rules (and the DOT dropped its proposed rule). However, with the spread of Zika virus and other vector-borne disease, this number may grow. The US needs to develop, promote, and seek WHO approval for a safe and smart way to
prevent the introduction of vector-borne disease carrying insects via the cabin and flight deck of commercial flights.

What are the alternatives to onboard spraying?

Non-chemical means of disinsection are a smarter, safer way to prevent the transport of bugs that carry disease. The US Department of Transportation (DOT) first proposed the development and testing of a non-chemical alternative in 2002, creating and leading an inter-agency task group that included the CDC, Department of Defense, Environmental Protection Agency, Federal Aviation Administration, and US Department of Agriculture (USDA). In a partnership with the DOT, the USDA designed trials intended to assess the efficacy of air barriers to prevent the passage of flying insects in a test environment intended to simulate a boarding bridge and forward cabin (Carlson et al., 2006). The team concluded that the air blowers were effective at containing more than 97% of released mosquitoes, using only strategically placed off-the-shelf units that were not designed for use on aircraft. Units tailored for this application would increase that efficacy rate further. The team recommended the use of air blowers at passenger boarding doors and customized, self-closing, net curtains over aircraft service doors, both of which have been designed. There is an urgent need for the USDA and DOT to implement the necessary testing and validation processes so that airlines can opt for non-chemical means of disinsection. Airlines should not have to expose their passengers and crew to pesticides which may or may not work; pesticides that will elicit complaints and some acute illness; pesticides that will feed insecticide resistance.

Can the US government develop its own methods to prevent the transport of bugs?

The US is bound by ICAO standards and recommended practices, which include following WHO guidelines for aircraft disinsection. However, the US has the option to formally notify ICAO of a “difference” to WHO-recommended practices, even if only as in interim measure. In this case, the US could choose to use its own validated non-chemical methods of disinsection to protect its own public health. In 2007, in response to a DOT proposal, ICAO tasked its council with “encouraging the exploration of non-chemical approaches to aircraft disinsection of the cabin and flight deck,” including a comparison to chemical methods (A36-WP/230). The ICAO-led working group defined means to assess the efficacy of non-chemical disinsection (so the work is part way there). In 2005, the WHO formally amended its definition of disinsection to be a method that can either “control or kill” insects, such that mechanical methods would qualify.

What steps need to be taken to make non-chemical disinsection effective and available?

1) Ask the WHO to clearly define the necessary performance criteria for non-chemical disinsection;

2) As a priority, enlist the USDA to test the efficacy of the combined air blowers and net curtain on the range of aircraft types and operations (e.g., boarding bridge/wide-body aircraft, boarding bridge/narrow-body aircraft; air stairs, regional aircraft, etc.);
3) Draft a clear protocol for airlines to implement non-chemical disinsection, as part of a vector-control plan at and around US airports, especially those that serve the international market; and

4) Formally invite the WHO to review and approve the protocol as an alternative to chemical disinsection.

**What needs to change for flights to countries that continue to insist on pesticides?**

If a country insists on chemical spraying on incoming flights, then suitable crew/passenger education and exposure prevention measures are necessary. For example:

1) Flight attendants assigned to spray cans of disinsectants inflight should be provided with a suitable mask and gloves, and be instructed to wear long sleeves;

2) Residual spraying schedules must ensure sufficient drying time to ensure that boarding will not be initiated until the cabin is dry and odor-free.

3) Crew bunks should not be sprayed, which could be supplemented by a “no food” rule in crew bunk rooms.

4) Passengers should be informed in advance of ticket purchase about any routine inflight spraying rules, as well as any potential residual treatment spraying.

**What other protective measures could supplement non-chemical disinsection methods?**

Non-chemical disinsection should be part of a vector control plan at international airports. Other means that could be implemented more widely include:

1) Addressing any sources of standing water at/around airports because these can serve as breeding ground for mosquitoes;

2) Sterile insect release programs;

3) Insect trapping programs;

4) Ban on the import of certain wood and plant products (which are associated with certain pests);

5) Cargo hold inspections; and

6) Aerial spraying around the airport of departure.