

## Your Airport Is a Petri Dish



*The part of air travel that gives you a cold (or worse) isn't usually the plane ride -- it's these leading disease-spreading airports.*

Most people don't associate jet bridges and moving walkways with swine flu. What really bothers us are airplanes: cramped, crowded aluminum tubes where a sneeze from across the aisle is enough to set off warning bells in our heads. In cultural mythology, airplanes are where superbugs are born and entire cabinfuls of passengers infected in a single trip -- offloading hundreds of new carrier agents at journey's end into vulnerable environments.

It turns out, though, that the likelihood of actually catching something on a plane is kind of low. You'd basically have to be sitting on top of someone to become infected by their germs. According to Aaron Carroll, co-author of *Don't Cross Your Eyes... They'll Get Stuck That Way!*, airplane manufacturers have more or less gotten air circulation onboard their products down to a science. Between drawing in clean, fresh air from outside the cabin and passing old air through high-quality filters designed to catch 99.999 percent of germs, the air inside a cabin is replaced some 20 times an hour -- far more often than in office buildings or in houses, which exchange air every 12 and 5 times an hour, respectively.

Add to that the fact that each row of an aircraft's air supply is recycled vertically rather than moving forward or backward through the cabin -- meaning airborne germs that survive the filters come back to the same row rather than spreading to other passengers -- and what you get is a system that's pretty hard to beat.

Even if airplanes aren't the germiest cesspools they might seem at first glance, airports are another story. They're tremendous incubators for disease. The constant flow of passengers all day, every day means that

pathogens are deposited, picked up again, and ferried elsewhere at an incredible rate, without the procedures that keep aircraft interiors clean. Not all airports are created equal, though: some hubs are more conducive to spreading illnesses than others. Which ones are the worst offenders? That's what a team of MIT researchers decided to find out.

Using a statistical model based on network theory, scientists at MIT's Department of Civil and Environmental Engineering have created a ranking of the top 40 U.S. airports in order of their ability to spread a disease that originated there. Leading the list: New York's JFK International, followed by Los Angeles, Honolulu, San Francisco, Newark, and Chicago's O'Hare and Washington's Dulles International Airport.

Some of these results are startling; given its place in the middle of the Pacific Ocean, for example, Honolulu might not seem like a big threat to anyone. But in fact, its relative isolation is precisely the problem: Hawaii is one of the only destinations in the area with enough infrastructure to support a great deal of traffic -- which, unsurprisingly, leads it to see a great deal of traffic. And even if it's physically removed from other locales, Hawaii shares a direct connection to many other gigantic hubs, a fact that only increases the risk of disease transmission.

Connectivity, traffic, and geography: these make up the three elements that determine the extent of an airport's contribution to disease spread. Relatively little work has been done on the role of airports in the early stages of a crisis, the researchers say; more attention is generally given to the late stages of an outbreak. But this research is different.

*To illustrate their findings, the scientists put together a mesmerizing visualization:*



The role of U.S. airports in disease epidemics

So if you were concerned about falling ill during your vacation this year, good news: you're probably more likely to get sick from the local cuisine than by sitting next to a mouthbreather on your flight. On the flip side, though, you might want to consider flying directly to your destination, to avoid as many airports as possible.

<http://www.theatlantic.com/health/archive/2012/07/your-airport-is-a-petri-dish/260228/>