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Planes, Trains, and … Germs?

Travel Health Risks You Can -- and Can't - Avoid

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WebMD Feature

Wherever you go, however you get there, you always have traveling companions --germs.

Will these fellow travelers make you sick? That depends partly on luck, experts say. But you can do a lot to protect yourself.

The modes of transportation most often blamed for spreading disease are airplanes, cruise ships, and subway trains. Are they just scapegoats? Or are these popular conveyances really making us ill? WebMD asked experts who've studied transportation health.

Up in the Air, Germs Are There

The Ides of March, 2003, was unlucky indeed for the 120 travelers who that day boarded Air China flight 112. The Boeing 737-300 completed its three-hour flight from Hong Kong to Beijing without apparent incident. But coughing in seat 14E -- a middle seat near the center of the plane -- was a person carrying the deadly SARS virus.

Within eight days, 20 passengers and two flight attendants would come down with SARS. Some of those who became infected were sitting as far as seven rows away from the man carrying the SARS virus. Five would die.

It's not just SARS - and it's not just China. In 1979 a commercial airliner sat on the tarmac for three hours with its ventilation system shut down. Someone on board had the flu -- and, within three days, so did nearly three-fourths of the plane's passengers.

SARS and influenza, of course, are only two of the multitude of bugs lurking out there. But the case of Flight 112 suggests that the current understanding of the spread of airborne disease aboard aircraft, which is based on tuberculosis investigations, may be outdated. Emergency medicine specialist Mark A. Gendreau, MD, senior staff physician at Lahey Clinic Medical Center, Burlington, Mass., recently reviewed what is and isn't known about infectious disease spread during air travel.

"The CDC and World Health Organization say you risk getting an infection only if you are sitting within two rows of someone who has something - and only if you are sitting there for more than eight hours," Gendreau tells WebMD. "But Flight 112 was only three hours long, and people sitting as far as seven rows back were affected. So that says, 'Wait a minute folks.' That old advice may have worked for tuberculosis, but what about SARS and other infectious diseases? More study into that is needed."

There's a lot we don't know, agrees Roy L. DeHart, MD, MPH, senior consultant in occupational and aviation medicine at Vanderbilt University, Nashville, Tenn. And if anyone understands the various health risks of flying, it's DeHart. He capped his 23-year Air Force career as commander of the USAF School of Aerospace Medicine. Former director of occupational and environmental Medicine at the University of Oklahoma, he's an FAA-certified senior aviation medical examiner.

"We don't know what that passenger next to you is contributing to the air stream as he is inhaling and exhaling," DeHart tells WebMD. "With flights coming out of developing countries where prevention programs are not as strong as they might be, it is not unusual that a person may have a problem like tuberculosis. It spreads. Usually just to two or three people, but if a patient is found on board, health authorities have a tough job trying to track those people down. It can be a horrendous problem. There can be hundreds of patients spreading whatever, wherever. Major spread is possible. So, yes, there can be problems."

Which Is Healthier: High-Flying Planes or High-Rise Offices?

Air passengers often complain about aircraft ventilation. But Gendreau notes that a normal airplane cabin changes its air 15 to 20 times an hour. A typical office building changes its air 12 times an hour.

High efficiency particulate air (HEPA) filters scrub the air on some planes. The filters may be able to trap airborne viruses because they catch the droplets that carry the viruses. But 15% of U.S. commercial airliners carrying more than 100 passengers lack HEPA filters.

"Federal regulatory agencies need to tighten the rules in terms of ventilation and in terms of the HEPA filters that are used," Gendreau says. "Now, in the U.S. and Europe, there are no requirements for how much ventilation an aircraft should have. They don't specify what kind of HEPA filters to use - or even require them."

Even so, there's no definitive proof linking airplane ventilation to disease spread. Overall, the risk of catching something from another infected passenger is about 1 in 1,000 -- about the same as an office building or any other confined space. And Gendreau points out that mathematical models indicate that doubling a plane's ventilation rate would cut the risk of airborne infection by half (using tuberculosis as a model).

Yet airplanes make infection easier in other ways. One example is pressurized air. Planes normally set cabin pressure to what you'd experience at the top of an 8,000-foot mountain. Since cruising altitudes are higher than this, planes cycle air through their engines to pressurize it. That heats the air, which is then cooled. This wrings out just about every drop of moisture.

"We end up with low-humidity, desert-like air," DeHart says. "The longer you fly, the drier your mucous membranes get. And the dryer they get, the more susceptible they are to infection. So in a cabin with nearly 500 people, the air is circulated, the air is filtered -- but still, infectious material gets spread."

Most of that spread comes from the people sitting next to you, and in the two rows in front of you and behind you. If one of these people has a cold, you are at risk.

"The risk is higher than your typical office environment, because of the much higher concentration of people for the air that you have," DeHart says. "The impact of colds is probably more frequent than you would have in just an office setting."

Is There a Health Risk From Pillows, Blankets, and Tray Tables?

Germs don't just fly through the air. They also lurk on contaminated surfaces -- what infectious disease specialists call "fomites."

Gendreau warns that there's a lot of "hype" around this issue. The facts, he says, don't turn up any obvious dangers.

"There have been a number of microbiological content studies of aircraft cabin. In fact, the FAA is currently looking into this," he says. "The British government's aviation health working group recently looked at microbial flora [germs] in two different aircraft types. They found that this stuff is not worse - and maybe better - than other places where people congregate like buildings or other modes of transportation."

DeHart, a frequent flier just back from a trip to Asia, doesn't worry about pillows or blankets, either.

"These blankets and stuff are pretty well cleaned. I don't know in the medical literature of any spread from a fomite like that," he says. "You can't say this hasn't happened. But I don't worry about it. I will certainly use a blanket to stay warm and cozy so I feel like going to sleep. Although usually I use my own air pillow because it adjusts."

If you're going to worry about contamination on airplanes, shift your focus from the overhead compartment to the onboard water system. A recent EPA study found coliform bacteria - germs associated with feces - in water from galley water taps and lavatory faucets in 17% of airplanes tested.

Every expert tells WebMD the same thing: The best way to protect yourself against germs is to wash your hands. Hand washing removes viruses as well as bacteria. Of course, it gets complicated if the water you wash with is itself contaminated.

Gendreau has a solution. He carries a portable bottle of alcohol-based hand-sterilizing gel. The gel isn't as good at killing viruses as soap and water. So Gendreau washes his hands - then uses the gel.

"What I typically do is wash my hands a lot. If you're going to get something through a seat table, pillow, or what not, washing your hands is the way to minimize your risk," he says. "You wash in that washroom, but what is the coliform content on your hands now? So that is why I slap on the alcohol gel. Within 10 seconds it kills all the bacteria."

DeHart has more tips.

"Be healthy and rested before making a flight," he says. "If you already are coughing and under the weather, you will be worse after flying. So you need to have taken good care of yourself, and ensure you are taking the medications you should be taking. If you have any question of health -- your heart, particularly -- check with your doctor before flying. And as you're flying, you need to hydrate as much as you can. The flight crews are good at distributing water. You should drink that, and take a bottle or two yourself on board. Hydration is a must."

Off on a Cruise, the Germs Don't Snooze

If airplane ventilation has you worried, maybe you're thinking of taking an ocean liner instead. After all, there's a lot of fresh air out on the open seas, isn't there?

Of course there is. That may be one reason why 9.4 million people last year sailed out of U.S. ports.

With a change in transportation mode come changes in disease risk, DeHart says.

"Cruise ships provide an entirely different environment. You are there for days, dependent on them for all your meals, and on the ship crew for hygiene," he says. "You are thrown in with many more people than on an airplane, so there is a much greater chance of communicable disease being present. … And some viruses just go ape when they get on a cruise ship with a lot of people."

Such viruses tend to be the notorious noroviruses. Noroviruses cause what many people call "stomach flu" -- although these bugs have nothing at all to do with the flu. What they do is cause nausea, vomiting, and stomach cramps. And they spread like wildfire. All it takes is for you to touch a contaminated surface and then touch your mouth.

Because of the recent rash of norovirus outbreaks on cruise ships, the CDC keeps a close watch. Lisa Beaumier is a public health analyst with the CDC's vessel sanitation program. Beaumier says noroviruses are likely everywhere, not just on cruise ships.

"Norovirus is not tracked in the normal public. But cruise ships are required to report to us, so anyone who visits the medical center on a ship, the doctor or nurse will report all cases to us," Beaumier tells WebMD.

So how do you protect yourself from norovirus infection? Beaumier's main advice is going to sound familiar.

"One main thing is to wash your hands before eating, smoking, touching your face, or going to the bathroom -- and using hand sanitizers in conjunction with hand washing," she says. "Other things you can do is if you see someone get sick, with vomiting or diarrhea, you should leave the area because you could get sick from contaminated air. If you see someone with diarrhea in the bathroom, you should leave and notify the ship staff."

You can actually see up-to-date health reports on all ships sailing from U.S. ports -- and a list of all ships getting a perfect score -- at the CDC's vessel sanitation program web site.

Down in the Train, the Germs' Domain

Maybe, after thinking about airplanes and ships, you've decided to postpone your vacation and go back to work. And maybe you'll be taking the subway. That's how occupational health and safety specialist Robyn Gershon, DrPh, gets to work at Columbia University's Mailman School of Public Health in New York City.

Gershon didn't start out looking at germs. She got interested in subways when she heard reports of hearing loss among transit workers. While studying the issue, she decided to look at other subway health issues. What she found was … not much. It turns out there's very little scientific information on infectious disease in the subways.

"Subway systems are big public-use spaces," Gershon tells WebMD. "There are 14 big U.S. subway systems and millions and millions of riders. For any number of reasons, there are health hazards. But there is this huge volume of people, and we are not studying it."

When Gershon turned her attention to infectious disease spread on subway systems, she found "not one scientific paper at all."

"You can imagine because of all the surfaces, all kinds of organisms can be transmitted from the hand rails, the head rests, the seats," she says. "It is almost inevitable disease transmission has happened, but it is hard to prove."

Meanwhile, Gershon is taking precautions.

"After riding the subway, I never put anything in my mouth without washing my hands," she says. "I don't touch a thing in my office without going to the sink. The rails and everything are loaded with pathogens. Hand washing is a simple thing, and it is the only thing you can do. I have seen a couple of people wearing face masks, but I wouldn't go that far. Clearly data are needed."

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