

UV Light on Airplanes Could Prevent Spread of Coronavirus and Other Infectious Diseases



By Alex Berezow, PhD — February 10, 2020

Boeing has designed self-cleaning airplane bathrooms that implement UV light. To stop the spread of infectious disease, the entire airplane cabin -- and perhaps other public places -- should also be bathed in UV light.



Credit: Simon Davis/DFID/Wikipedia [1]

Several major airlines have cancelled flights into China because of the Wuhan coronavirus (also called 2019-nCoV). The U.S. State Department has gone further by issuing a "do not travel" warning for China.

These decisions seem like colossal over-reactions. While people are understandably concerned, there may be smarter ways of preventing the spread of coronavirus that don't involve shutting down international travel. Maybe simple technology could help.

Use UV Light to Disinfect Airplanes

Airplanes feel gross, but they may not be all that much dirtier than anything else we encounter in public places. In fact, in some ways, they might be cleaner. Contrary to popular myth, [airplane air is probably cleaner than office air](#) [2] due to more frequent refreshing. (Airplane air is only partially recycled; outside air is constantly streamed in.)

Other than the bathroom, the nastiest part of the airplane is probably the seat, armrests, and tray

table. These things [may or may not be adequately cleaned](#) [3]. If an airplane is due for a quick turnaround, it's almost guaranteed that the stuff you're sitting on and around won't be cleaned well. So what airlines should do is install UV lamps and blast them for a few minutes while nobody is on board between flights.

Boeing has designed a [self-cleaning bathroom](#) [4] that does precisely that in between uses. The airplane manufacturer claims that the UV lamps kill 99.99% of microbes within three seconds. Some hospitals fire up [robots to bathe patient rooms with UV light](#) [5] in the hope of reducing deadly healthcare-associated infections. While there are some UV-resistant microbes, they tend to be extremophiles (i.e., microbes found in extreme environments), not human pathogens.

UV is an indiscriminate killer that can target both bacteria and viruses. UV light is such a potent disinfectant for the same reason that it causes skin cancer: Its high-energy photons damage DNA. Specifically, UV light causes the formation of "thymine dimers." When exposed to UV light, thymine (the "T" in the DNA alphabet of A, T, C, and G) can form [abnormal bonds with neighboring thymine molecules](#) [6]. Afterward, when the cell tries to replicate its DNA, the presence of the dimer triggers a mutation. In a microbe, it could be lethal; in a human cell, it could cause cancer.

That's why, if airlines were to use this technology, they could only deploy it when nobody is on the plane.

But why stop with airplanes? Pretty much every public space -- restaurants, shopping malls, trains, subway stations, etc. -- could benefit from this low-tech solution. Occasionally, the best answers to some of life's toughest problems are surprisingly simple.

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Links

[1] [https://en.wikipedia.org/wiki/Ultraviolet#/media/File:Ultra-violet_screening_for_potentially_Ebola-carrying_liquids_\(15811190376\).jpg](https://en.wikipedia.org/wiki/Ultraviolet#/media/File:Ultra-violet_screening_for_potentially_Ebola-carrying_liquids_(15811190376).jpg)

[2] <https://www.acsh.org/news/2016/11/15/relax-your-child-wont-die-airplane-peanuts-10444>

[3] <https://science.howstuffworks.com/transport/flight/modern/airlines-clean-planes-quickly.htm>

[4] <https://www.travelandleisure.com/articles/boeing-self-cleaning-lavatory>

[5] <https://interestingengineering.com/uv-bacteria-killing-robot-cleans-hospital-rooms-far-better-than-humans>

[6] <https://pubs.rsc.org/en/content/articlehtml/2013/pp/c3pp50147g>