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Dear Dr. Dowdle:

I was disturbed to learn that tuberculosis infections might be occurring among airline passengers because of poor ventilation in aircraft cabins (New York Times, 6/21/93). I was, however, pleased to see that your office is taking this possibility seriously and is conducting studies to determine the true nature of this threat.

I believe this is a long-overdue step in the right direction, and I hope that these studies (regardless of their findings) will be followed by additional studies to determine the health effects of inadequate air quality during airline flights, both domestically and internationally.

Obviously, my company has had a strong interest in aircraft air quality for a number of years, and our interest continues as a number of anti-smoking organizations push for total smoking bans on international flights. We believe such bans are unjustified and, in fact, create more harm than good because substance-by-substance bans detract attention from the only meaningful way to address poor air quality in air cabins -- adequate ventilation.

At least as early as 1986, the National Academy of Sciences pointed out that improving ventilation during airline flights was essential to ensuring the health of airline passengers. The NAS noted (emphasis added):

"The ventilation characteristics that directly affect concentrations of biologic particles are the ones that affect concentrations of all interior particles; the quality and quantity of outside air and the quality of filtration in the recirculation systems. The outside air supplied to aircraft cabins during flight is essentially clean. Enough outside air needs to be supplied to dilute the inevitably produced bacterial aerosols to the point where the risk of infection is minimized."

"We work for smokers."

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"Filters currently used in aircraft ventilation systems probably remove only a very small fraction of the continually produced bioaerosols, although data are not available to assess this accurately."

Nonetheless, the NAS recommended a smoking ban on airplanes. But because the NAS recommendation was not scientifically supported, the DOT did not adopt that recommendation.

Three years later, the FAA reaffirmed the DOT position, stating in the May 26, 1989, Federal Register:

"At this time, scientific evidence has not sufficiently established that there is a significant health risk to nonsmoking passengers and crewmembers, while on board an aircraft, when other passengers are smoking and the existing smoking regulations are enforced."

After noting that the DOT had initiated a new study of air quality in aircraft cabins, the FAA concluded: "Further rulemaking at this time is premature." Nonetheless, Congress bowed to anti-smoking pressures and banned smoking on domestic flights of six hours or less.

At that time, my company and other interested parties predicted that inadequate ventilation coupled with low relative humidity would continue to lead to irritation and illness among airline passengers and crew members. Our predictions were dismissed because of our "vested interest." But those predictions have, apparently, unfortunately come true. And the health of airline passengers will continue to be compromised until steps are taken to provide adequate air cabin ventilation.

What many people don't seem to understand is that it is our "vested interest" which has led our scientists to develop a great deal of expertise in this area.

R.J. Reynolds has, for a number of years, conducted studies to determine how much ETS is in various indoor environments, including aircraft cabins. This research (some of which is included with this letter) has been published in peer-reviewed journals and has consistently shown that ETS levels in airline cabins were extremely low in both smoking and nonsmoking sections and on both short and long flights.

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At the time that Congress increased the smoking ban to flights of six hours or less, our nicotine measurements showed that a passenger in an airplane's nonsmoking section, on average, would have had to travel 16 round trips between New York and San Francisco to be exposed to the nicotine equivalent of one cigarette. Other scientists, both within and outside the tobacco industry, have measured ETS in aircraft and confirmed that average ETS levels in airline cabins were minuscule.

An important point to note is that anti-smokers often argue that ETS levels would be higher on longer flights, since more cigarettes would be smoked. While that conclusion seems to be intuitively correct, research has shown quite the opposite. ETS levels on longer, international flights have been consistently below the levels measured on shorter, domestic flights.

The DOT study that was published in December of 1989 concluded that "airliner cabin air concentrations of bacteria and fungi, and the prevalence of their respective taxa, are not indicative of significant potential for illnesses (e.g., hypersensitivities) associated with some indoor environments. It is recognized that this conclusion is appropriate for 'healthy' passengers and not necessarily for immunocompromised persons."

In addition, the report noted that DOT did not collect data concerning viral contamination in aircraft cabins.

Nonetheless, the data that the DOT did collect indicated that "[i]ncreased air exchange rate appeared to lower the average bacterial concentrations, with little effect apparent for average fungal concentrations. The passenger load factor appeared to increase average bacterial and fungal concentrations when comparing <50 percent loading to >90 percent loading."

The DOT report further concluded that "[c]onsistent with recommendations made by the National Research Council (1986), if the risk of illness, whether due to an infection or a hypersensitivity disease, is to be reduced, the amount of outside air supplied to each passenger should be maximized because of the low levels of contaminants associated with this air."

Since 1989, as financial pressures on airlines have increased, attempts have been made to increase passenger loads while reducing energy costs by cutting back on air exchange rates. This has been accomplished in two ways: 1) through newer ventilation systems that rely more heavily on recirculated air, and 2) through reductions in the amount of fresh air introduced into older airliners.

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In addition, the fact that smoking has been banned on most domestic flights has allowed airline companies to "justify" further reductions, despite the fact that, as The New York Times pointed out, "[s]ome flight attendants and passengers have begun complaining of headaches, nausea and other health problems, especially after long flights, that they say could be a result of the reduced ventilation."

The implications of efforts to increase passenger load while reducing ventilation directly contradict the recommendations made by both DOT and NAS. Furthermore, there is still a great deal of uncertainty concerning the potential health effects of poor air quality in airline cabins. As NAS stated in 1986:

"Dose-response relations for most organisms are unknown and differ widely from one organism to another. One infectious droplet is sufficient to cause tuberculosis infection, but thousands of droplets are probably necessary to transmit rhinoviruses. In fact, infective dose varies not only with the individual virus or bacterium, but also with such host susceptibility factors as vulnerability of specific cells in the respiratory tract, antibody concentrations, and the presence of predisposing conditions. For example, a person who is in any way immunocompromised -- through disease, chemotherapy, or radiation therapy -- is highly susceptible to all forms of infection and should not frequent indoor spaces occupied by potentially infectious people. The numbers of spores or particles or concentrations of antigens required to induce hypersensitivity diseases remain completely unknown and most likely vary greatly with the susceptibility of exposed persons."

The fact that your office is now investigating the possibility that some people have been infected with tuberculosis because of poor airline air quality provides compelling evidence of the harm that can occur when science is subverted by political agendas. Had anti-smokers been truly interested in addressing human health problems resulting from poor air quality in airlines, they would have pushed for increased ventilation that would have addressed all air contamination problems, including tobacco smoke. If that had occurred, perhaps the airlines would have taken a broader perspective on this issue. And perhaps they could have prevented many needless cases of illness.

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We can't undo what has been done. But we do have the opportunity to learn from our mistakes and not repeat the past. As the current effort to ban smoking on international flights continues, I urge you and your office to actively call for a solution that deals with the total issue of air contamination in airline cabins. If we are truly committed to safeguarding the health of airline passengers and crew members, we can't afford to succumb to the temptation of short-sighted "solutions" and stop-gap measures that happen to be "politically correct."

Thank you for taking the time to consider this input. I hope you will also take the opportunity to study the background materials I have included with this letter.

Sincerely,



Carl W. Ehmann, M.D.

Attachments