

## [Aeronautics](#)

### 'There are hundreds of sick crew': is toxic air on planes making frequent flyers ill?

Kate Leahy used to work as cabin crew, until she was signed off sick. Then a young colleague died in 2014. She talks to the former staff looking for answers



Aerotoxic syndrome is a term used to describe the symptoms of exposure to contaminated air.

Photograph: krystiannawrocki/Getty Images

*Kate Leahy*

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Three years ago, Matt Bass, 34, died suddenly in his sleep. According to his father, Charlie, he had been feeling unwell for a few months. He'd lost weight, had digestive and respiratory problems, and suffered from severe fatigue. Doctors thought he might have [Crohn's disease](#), but were struggling to reach a diagnosis.

Matt was cabin crew for [British Airways](#), and on the day he died had returned overnight from Accra, Ghana (by cabin crew standards, a relatively short, six-hour flight). He went for a scheduled MRI scan, hoping to get to the bottom of his ill health, then in the evening to a crew friend's house in Slough for pizza. After a few hours, he said he needed a rest and went to lie down. When his friends couldn't wake him, they administered CPR. An ambulance arrived and took him to A&E, where paramedics tried to revive him; but he never woke up.

When I meet Charlie Bass in a hotel lobby in Colnbrook, a small village at the end of Heathrow's westerly operating runway, he is warm but his anger is still clear. "Matt wanted to fly for as long as Fiona, my wife, and I can remember. When he was just eight years old, he wrote to [British Airways](#) to ask about becoming a pilot. They wrote back and told him to apply when he was 18." He smiles.

The initial postmortem did not reveal a reason for the sudden death. “The coroner’s office couldn’t tell us why Matt had died,” Charlie says. “At first we felt numb and kept asking why? We just wanted to find out what had happened.” Then two aviation experts got in touch with Charlie and Fiona. Dr Michel Mulder, a former pilot and consultant in aviation medicine, and Frank Cannon, an aviation lawyer, suggested the couple arrange a specialist secondary postmortem to look for specific toxins in Matt’s body. “We didn’t know if there would be an answer, but because of the information we had from ex-crew members who were ill, we were confident Matt’s symptoms were the same.” Desperate, they spent around £5,000 on tests; the results showed that Matt had high levels of organophosphate poisoning, one of the many effects of exposure to toxic cabin air, otherwise known as aerotoxic syndrome.

Aerotoxic syndrome is a little-known term used to describe the symptoms of exposure to contaminated air. It is a controversial diagnosis, and many in the aviation industry are adamant it doesn’t exist. But Mulder, Cannon and other campaigners believe it is responsible for long-term sickness, and even death, in a disproportionate number of people who work as cabin crew and pilots. Aerotoxic syndrome has also been cited as the reason for ill health in passengers in a number of cases. Cannon says he has more than 100 cases on his books, including two frequent fliers. Two of these cases have made headlines. Cabin crew member [Warren Brady](#), 46, died of a heart attack as he slept during a break on a flight from Heathrow to São Paulo in June 2014; his family and friends claimed he had been suffering from severe headaches, numbness in his limbs and mood swings, all symptoms of organophosphate poisoning. [Richard Westgate](#), 43, was a pilot who died in 2012. Before he died, he had begun legal action against his former employer, British Airways.

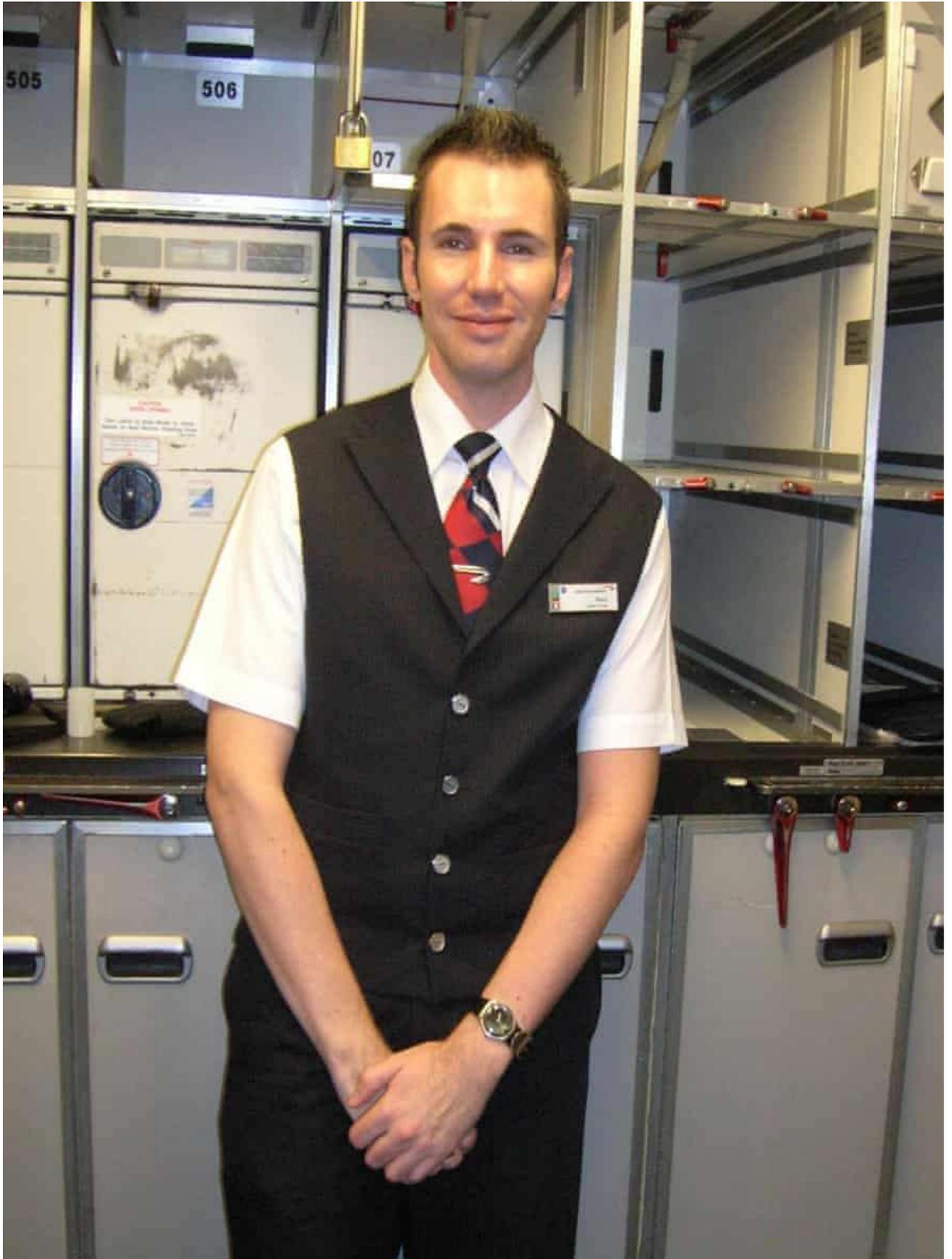
I’ll never know if I was subjected to contaminated air, but I began to hear stories of ex-crew members falling ill

I was a colleague of Matt’s at BA, employed as cabin crew for five years from 2004. I spent two years on short haul and three years on long haul. I loved the job, but had to leave after the effects of flying became too much. I was signed off work by my GP, suffering from depression and crippling anxiety, and ended up taking voluntary redundancy in November 2009. I was exhausted, and it took a good few months for what I considered to be severe jet lag to work its way out of my system. At the time, I wasn’t aware of aerotoxic syndrome. I’ll never know if I was subjected to contaminated air, but I began to hear stories of fellow ex-crew members falling ill.

“There are twice as many deaths at BA compared to the Metropolitan police,” claims ex-BA crew member Dee Passon. “I noticed a lot of crew were dying, so I asked the Met for a comparison, as both jobs involve shift work, unsociable hours and stress. I expected the police rate to be higher but, surprisingly, it was the other way round.” But a spokeswoman for British Airways last week said: “The death rate for cabin crew in service during 2014, 2015, 2016 and 2017 is similar to the matched age demographic in the general population, and there are no worrying trends in terms of cause.” Passon set up [Angel Fleet](#), a website and Facebook group dedicated to the memory of cabin crew who have died. The ticker tape of names that runs across the website often lists ages at time of death – 49, 51, 34, 30, with the average being around 43. “The most frequent causes are cancer, heart problems, suicide and brain haemorrhages. All of which can be caused by toxic poisoning,” she says. Passon herself has a letter from her doctor that states she has been permanently incapacitated by aerotoxic syndrome.

Aerotoxic syndrome was so named by a small team of medical researchers in 1999. In [their report](#), Dr Harry Hoffman, Professor Chris Winder and Jean-Christophe Balouet suggested that exposure to contaminated cabin air could result in long-term ill health, and needed further investigation. Since the 1950s, aircraft have used what’s known as the “bleed air” system to filter air through cabins. Air is sucked into the engine compressor (the cold part of the engine) before it is siphoned off into the air-conditioning units, where it mixes with the recirculated cabin air. Problems occur when the oil used to lubricate the combustion parts of the engine heat up and chemicals leak back through damaged or inefficient seals into the compressor – and from there into cabin air. Filters in the air-conditioning units are designed to remove bacteria, viruses and dust. Obvious leaks, identified by smoke or “dirty sock” smells, are known as fume events and can cause acute toxicity, with symptoms

ranging from runny nose to memory loss, severe headaches, loss of balance and muscle weakness. But the constant low-level, “silent” seepages are, crew and pilots claim, just as much of a problem.



Matt Bass, who died in 2014. Photograph: Courtesy of Charlie Bass

Dr Susan Michaelis, a former pilot and renowned expert in the field of aviation safety, has briefed the industry on contaminated air for over a decade. In a paper [published in June 2016](#), she claimed that the air inside today's aircraft is not up to the standard required by the official regulations of the Federal Aviation Administration (FAA) and the Civil Aviation Authority (CAA). "A change in the manufacturing process is long overdue," she says. "This design flaw has gone on unaddressed since the 1950s, and it is without question time to move all aircraft away from this system, or make changes that prevent people having to breathe hazardous air when they fly." In her [most recent paper](#), released in June 2017, which compared two studies (one looked at 274 pilots, the other looked at 15 different incidents), she identified "a clear pattern of acute and chronic adverse effects", finding that in the incident study, "87% of them were found to be related to oil leakage". Now, she says, "The evidence available is overwhelming. For an industry that prides itself so highly on safety, this is a gaping black hole."

But getting acknowledgment that the condition even exists can be a challenge. Cannon, whose [27-page review](#) was published last year, claimed there were half a dozen doctors in the UK and a further 12 throughout Europe who know what to look for when diagnosing aerotoxic syndrome. However, diagnoses are often still not recognised, and the airlines, he says "refuse to accept it as a reason for sickness".

Sarah Mackenzie-Ross, a specialist in neurotoxicology at University College London, conducts research into the impact of toxins on psychological function. She has been trying, unsuccessfully, to get funding for a large-scale epidemiological study of pilots for years, having seen hundreds displaying symptoms in her clinic. "At one point, the CAA and the Department for Transport approached the university to ask for my research to be shut down," she says. "They tried to suggest that the work I was doing with pilots was unethical; that if I found something wrong with one, I would be duty-bound to nominate the relevant authorities and get that pilot banned from flying. I think it was a ploy to stop us doing work on it." Asked if she believes people are being poisoned, she says, "What I can demonstrate is injury, not causation. While we can show cognitive impairment, we have, from a scientific point of view, no objective evidence of chemicals being to blame. Unless you do an epidemiological study, you can't rule out all the factors that are unique to flying."

In the meantime, for sufferers, getting recognition can be a time-consuming and frustrating process. Marta Bodi, 44, who flew as cabin crew for BA for 11 years, cries as she talks about her experience. "I first became ill in 2003, experiencing aches and severe migraines that continue today. After visiting numerous doctors, I was diagnosed with [fibromyalgia](#) and then, in 2006, still feeling ill, I was told I had chronic fatigue syndrome." Then, she says, "In 2008, I felt faint on a trip to Nairobi and had to be put on oxygen. I couldn't operate the flight home so I returned as a passenger. I was signed off long-term sick and spent the next two years pretty much bedridden. I had no energy, I couldn't sleep, I felt achy and I couldn't walk without help. If I breathed chemicals, I would vomit straight away. I was then diagnosed with multiple chemical sensitivity and instructed to wear a carbon-activated mask. I was like a 90-year-old in a thirtysomething's body."

After a year off sick, Bodi tried to return to work but, "On the second day of training we boarded an aircraft in the hangar and the smell made me instantly sick." She found a private doctor who diagnosed her with aerotoxic syndrome; but as she was unable to work, she lost her job and is now on benefits.

Boeing has been the only airline manufacturer to adopt a new 'clean air' system on board its 787 Dreamliner

Fellow sufferers have dedicated their lives to campaigning. John Hoyte was a pilot for TNT and Flybe, who operated the BAe 146 aircraft, [thought to be one of the worst offenders for leaks](#). He had been flying for 16 years when he was grounded for ill health, including suicidal feelings. He founded the [Aerotoxic Association](#) in 2007 to keep the public informed about what he claims is a "big cover-up". In the past 10 years, he's spent more than £200,000 of his own money campaigning for change, losing his marriage in the process. "It's been a complete disaster," he says. "But equally, I know what I'm doing is right."

Tristan Loraine was a BA captain before he retired on the grounds of ill health in 2006. “Two days after a flight, my blood was analysed and tricresyl phosphate was found in it. I now suffer from chemical sensitivity and have to live with the long-term effects,” he says. Loraine has spent 15 years campaigning for change, making documentaries and releasing a feature film, [A Dark Reflection](#), about cover-ups in the aviation industry. He believes, as well as the health implications, there is also a flight safety aspect. “How can pilots do their job if they are impaired?” he asks. “In [the Malmo incident in 1999](#) [on board a flight between Stockholm and Malmo], in descent, both pilots became incapacitated, later said to probably be from polluted cabin air.”



[Sky high: who'd be an airline pilot today?](#)

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Both airlines and manufacturers insist aerotoxic syndrome is a non-issue. Matt Bass’s former employer, BA, said: “There has been substantial research into questions around cabin air quality over many years... it has not shown that exposure to potential chemicals in the cabin causes long-term ill health.” [EasyJet](#), [Virgin Atlantic](#), [Rolls-Royce](#) (which makes aircraft engines) and [Airbus](#) all stated they complied with strict aviation guidelines. However, the Lufthansa group confirmed that it is investing money in new technology to check the quality of cabin air. Lufthansa, which includes Germanwings, the airline which suffered a catastrophic crash at the hands of pilot [Andreas Lubitz](#), said, “We have so far invested more than £428,000 into large-scale projects to get to the bottom of any reported incident in a transparent way. Filters are one of the projects used to check the quality of the cabin

air. The Germanwings fleet will be trialled with new technology filters for a year and a half. At the moment, approximately 60% of the fleet is already equipped.”

Boeing, one of the largest manufacturers of aircraft, said: “Our bleed air systems meet all applicable FAA requirements, and an overwhelming body of scientific evidence confirms the safety of them and the air on board our airplanes.” However, Boeing has been the only airline manufacturer to adopt a new “clean air” system on board its [787 Dreamliner](#). At its launch in 2009, Boeing promised passengers they would “arrive at their destination fresher”. When I asked why this was, a spokesman said, “People feel better after a long flight on the 787 because of its lower cabin altitude [the air pressure in the 787 cabin is equivalent to an altitude of 6,000ft instead of the normal 8,000ft] and higher humidity. The lack of a bleed air system does not affect this feeling.” However, [an extract from Boeing’s evidence to a House of Lords select committee on Science and Technology in 2007](#) seems to contradict this, stating that the Boeing 787 would have a no-bleed architecture that would eliminate “the risk of engine oil decomposition products being introduced in the cabin supply air in the rare event of a failed seal”.

Meanwhile, lawsuits against airlines are mounting. In the US in June 2011, Terry Williams, formerly a cabin crew member for American Airlines, won an undisclosed amount in an [out-of-court settlement against Boeing](#). She sued the manufacturer on the grounds of faulty aircraft design, which she claimed leaked toxic fumes into the aircraft cabin and left her unable to work. In Australia in 2010, [cabin crew member Joanne Turner successfully sued her employer](#), East-West Airlines, after a 10-year fight. She was awarded £84,000 in damages from the Australian High Court for her condition, which was referred to as “aerotoxic syndrome”.

Howard Beckett, director of legal services at Unite, Britain’s biggest trade union, says contaminated cabin air has been a concern among its members for a number of years. “We presently have 101 members we are representing in litigation cases,” he says, “one of which has successfully completed.” In March 2016, a claimant received a payout of £6,350 from British Airways in a settlement reached prior to court proceedings for what were described as symptoms “relating to a single fume event”.



Richard Westgate, who died in 2012. Photograph: Solent News & Photo Agency

As well as BA, Unite has handled cases by cabin crew against Jet2, [Thomas Cook](#), Virgin and easyJet, says Beckett. "I would estimate that about one third of those have had time off work as a result of their symptoms and another third have what you would class as relatively serious neurological symptoms."

Most people settle out of court, says Beckett, with non-disclosure agreements preventing them from revealing details. When asked why those affected would agree to keep things under wraps, he suggests it's similar to the asbestosis cases from 20 years ago. "When people had exposure to asbestos, it was payoffs in order not to talk about the seriousness of the substance," he says. For crew who are paid relatively low salaries, the compensation, when they are already struggling to work, is too much to refuse.

Following Matt's death, Charlie and Fiona, along with their elder son Charles, [set up an online campaign](#), asking for those concerned or affected to write to their MP requesting they take action. In March 2016, following pressure from campaigners and the deaths and pending inquests of Bass and Westgate, there was [a parliamentary debate](#), with MPs calling for a public inquiry.

Henry Smith, the Conservative MP for Crawley, the constituency in which Matt previously lived and which covers Gatwick airport, believes contaminated cabin air is an issue worth pursuing. "I have quite a few cabin crew in my constituency from different airlines who have contacted me," he says, adding that he has met with Charlie and Fiona Bass. He is hoping to move the issue up the political agenda. "With a new [transport secretary](#) and aviation minister, I wrote to both to highlight the issue and seek any update. The response at the time was that the European Aviation Safety Agency (EASA) were investigating and the DfT were closely following developments." Since then, the results of [EASA's two surveys have been published](#). They concluded that "a causal link between exposure to cabin/cockpit air contaminants and reported health symptoms is unlikely". This finding was based on 69 flights between July 2015 and 2016, 61 with the bleed air system, and eight on the 787 Dreamliner

– a relatively small sample given that there are more than 100,000 flights worldwide each day. However, Smith is attempting to keep the matter in the political conversation, mentioning aerotoxic syndrome in the House of Commons in June, and following up with the new aviation minister, [Lord Callanan](#).

At the initial hearing for the Richard Westgate case in 2015, the senior coroner for Dorset, Sheriff Stanhope Payne, [released a report](#) in which he warned of the “dangers of exposure to cabin fumes”. Yet, at the second hearing, there was a change of coroner and a change of opinion. In a statement from the coroner’s office, a spokeswoman said, “During the course of the last year, four doctors in different medical specialities have provided reports, none of which now support the opinion that Mr Westgate died from the effects of exposure to toxic air.” This opinion was reiterated at the final inquest in April, when coroner Dr Simon Fox QC said that exposure to organophosphates was “not a proper issue to be examined by this inquest”; he concluded that Westgate died after taking an accidental overdose of the sleeping tablet pentobarbital.

Matt Bass’s final hearing is still to be scheduled. At the preliminary hearing, a lawyer acting for BA suggested that any fumes in the cabin were most likely to have come “from the crew burning the paninis”.

This is not good enough for Charlie and Fiona Bass, who last saw their son on New Year’s Eve in 2013, when he spent Christmas with them in Dubai. “People will think that what we are fighting to expose does not exist, because it seems too unbelievable. But there are hundreds of grounded pilots and sick crew who will tell you otherwise. We’ve spent thousands trying to find answers, but many crew and families don’t have the money to pay for specialist tests. At some point, the industry and the government is going to have to admit it.”

For Matt, it will be too late. “Just before he died, he was chosen to crew the inaugural BA 787 Dreamliner flight,” Charlie says. “If he’d only ever flown on that aircraft, he may still be alive today.”

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