



The international crew health survey

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The results of an online aircrew health survey, started in March 2009 and having received over 1000 responses to date, are presented. The results are classified according to the reported health complaints. Comments received from some respondents are reproduced in the Appendix.

1. INTRODUCTION

In March 2009 Toxic Free Airlines started an online airline crew health survey in English¹ in order to establish how many crew members believe they are suffering occupational health problems as a consequence of their working environment.

This survey will remain indefinitely open to all serving pilots and cabin crew worldwide. It will be updated every year and the results published on the Aerotoxic Association website.²

2. RESULTS

To date, 1020 responses have been received from 24 countries in Europe, North & South America, Africa, the Middle East and Asia. All original survey forms are kept in the Toxic Free Airlines office and can be made available for viewing and verification of the data contained in this survey. The respondents comprised 50 pilots and 970 cabin crew, 864 of them from 1 major UK airline. 44% were male, 56% were female and the average age of those taking part in the survey was 41 years.

12 crew members reported no time off sick and no symptoms at all. 234 (23%) reported no time off sick, 786 (77%) reported some time off sick, 262 (25%) reported long term sickness of 3 weeks or longer, and 31% reported they suffered from allergies. Some crew said they had not reported sick to their airline but they had been ill on their days off, leave or part time weeks. Others said they went to work when they weren't 100% fit because they were afraid of the consequences of taking time off. The top 13 disorders with which crew have been medically diagnosed are given in Table 1.

Crew also told us they have been diagnosed with many other conditions not listed on the survey. The most frequently mentioned were chronic sinus and nose problems, vertigo, tinnitus, eye irritations, frequent colds and 'flu, and ear and throat infections.

Other conditions reported included pituitary tumour, brain tumours, endometriosis, osteoporosis, diabetes,

Table 1. The most common health disorders of aircrew.

Diagnosis	<i>n</i>	%
Depression	231	22.6%
IBS/Crohn's Disease	149	14.6%
High blood pressure	131	12.8%
High cholesterol	116	11.3%
Eczema/psoriasis	107	10.5%
Insomnia	103	10%
Migraine	100	9.8%
Pneumonia/bronchitis	84	8.2%
Asthma	77	7.5%
Chronic fatigue	75	7.3%
Miscarriage	70	6.8%
Thyroid disorder	64	6.3%
Cancer*	60	5.9%

*Not including those with precancerous cells or those who did not specify whether their tumour was malignant.

shingles, gallstones and carpal tunnel syndrome. There were also 2 cases of sarcoidosis of the lungs.

380 (37%) reported that they had the symptoms of peripheral neuropathy (numbness/"pins and needles" in face, hands and feet).

The responses to further questions are recorded in Figures 1–4.

3. DISCUSSION

UK national average figures for the reported ailments are compared with the survey data in Figure 5.

Using these UK national average statistics we would expect to see 5–6 cases of cancer in a population of 1020 people with an average age of 41. In the survey we have 60 people diagnosed with cancer, which is 10 times higher. The British Lung Foundation advises the usual incidence of sarcoidosis of the lungs in the UK is 1 in 10,000 of the population.

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¹ www.toxicfreeairlines.com

² www.aerotoxic.org

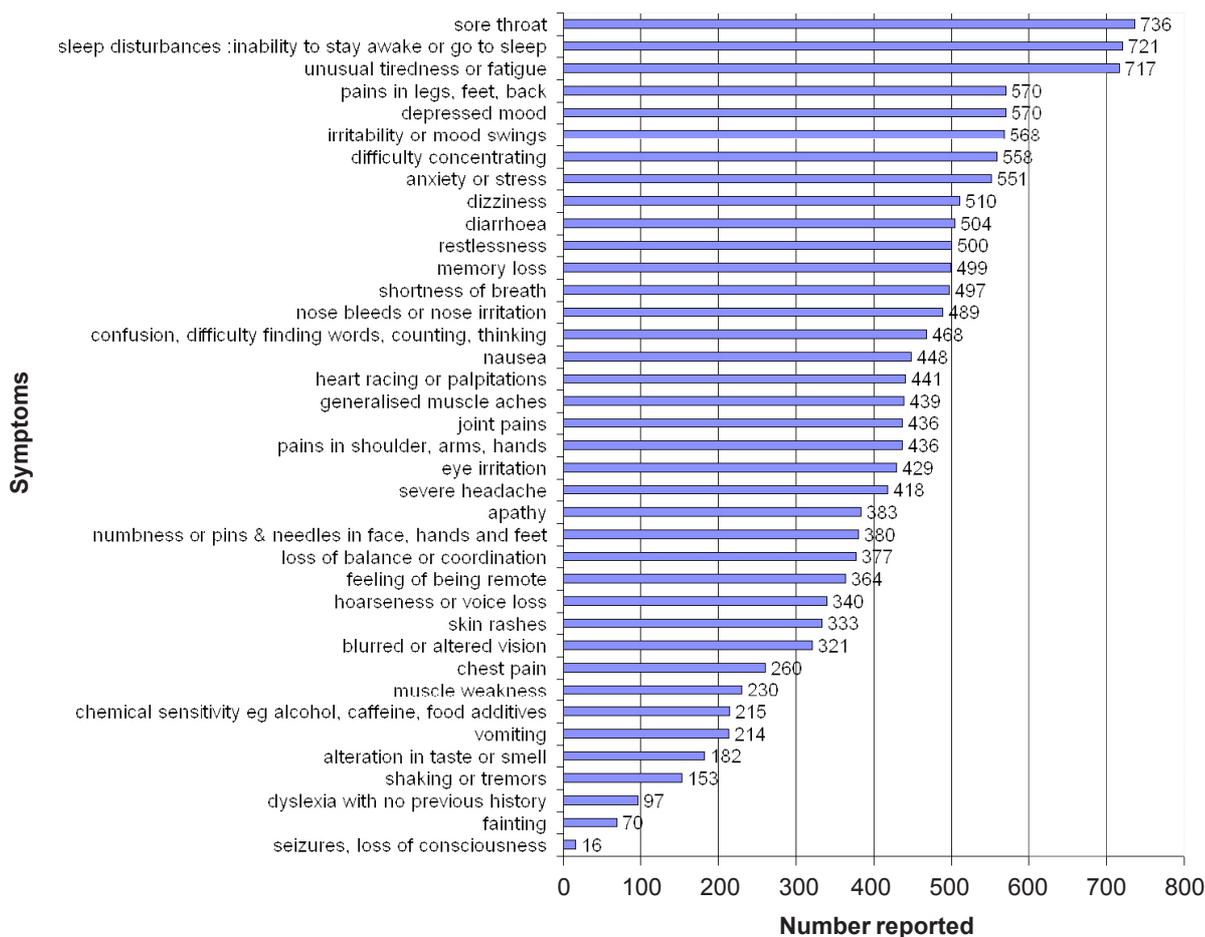


Figure 1. In the last 12 months have you suffered from any of the following?

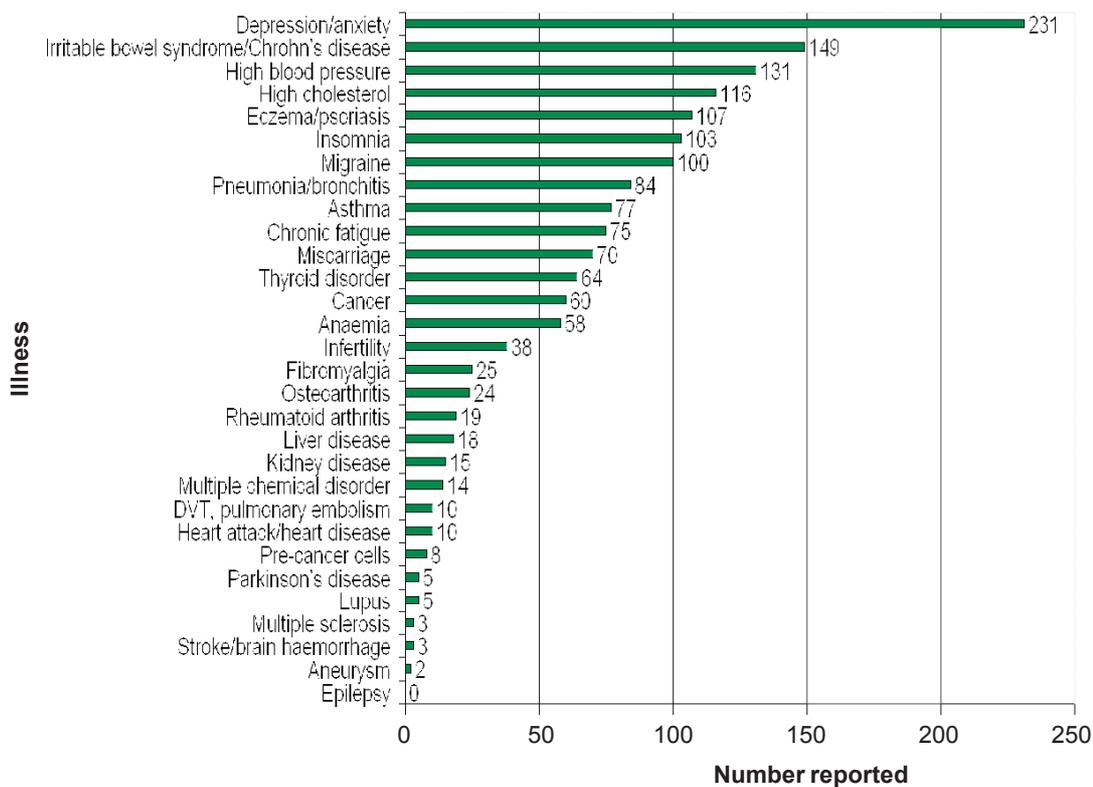


Figure 2. Have you been diagnosed with any of the following since you started flying?

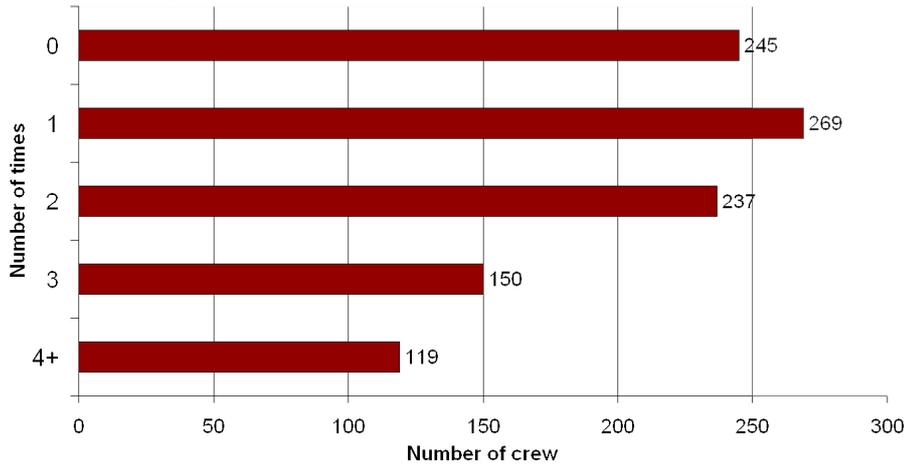


Figure 3. How many times have you reported sick during the last 12 months?

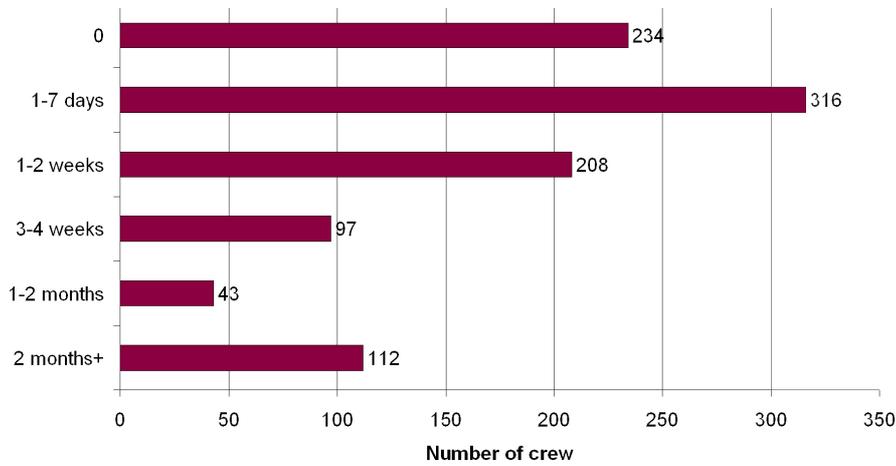


Figure 4. How long have you been off sick in total during the last 12 months?

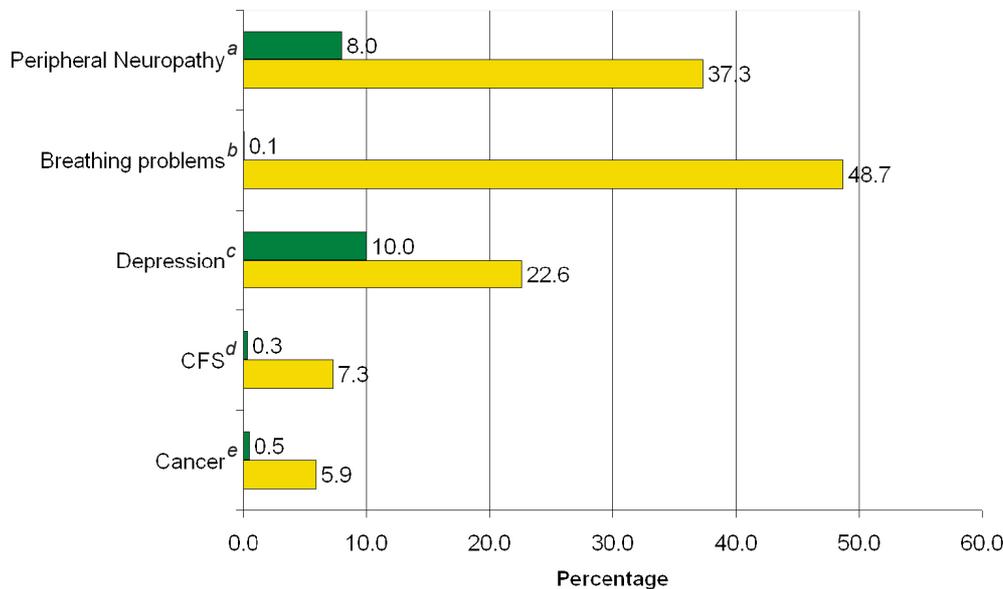


Figure 5. National averages compared with crew members suffering from diverse ailments.

Notes:

^a The *Medifocus Guidebook on Peripheral Neuropathy* states that the prevalence of peripheral neuropathy worldwide is estimated to range from 2–8% of the population.

^b Health & Safety Executive figures for 2008/09 give the estimated incidence of breathing or lung problems for people working during the previous 12 months to be 64 per 100,000 or 0.064%.

^c The Mental Health Foundation asserts that 1 in 10 of the population will suffer from some form of depression in any year.

^d ME Research UK estimates the national incidence of chronic fatigue syndrome (CFS) as 150,000 (i.e., about 1 in 400).

^e Cancer Research says the chance of a person aged 35–44 getting any cancer is 1 in 200.

4. CONCLUSIONS

The concern that emerges from the survey responses received so far is that not only is crew health being adversely affected as a consequence of the occupational working environment but flight safety is also being compromised. Both cabin crew and pilots say they are having difficulty performing their occupational duties: 45% said they suffered from confusion and difficulty in thinking, 55% said they had difficulty concentrating and 49% said they had memory loss.

These are people who were considered to be fit and well when they were accepted for the job. It is therefore possible that passengers are also being affected. Frequent flyers, the elderly, pregnant women, babies, children and those with underlying health issues could be at risk.

We urge the airlines and regulators to apply the precautionary principle and protect airline workers and passengers from harmful health effects by fitting bleed air filters and contaminated air detectors without delay.

ACKNOWLEDGMENTS

Grateful thanks to all the crew who have completed surveys for providing this personal information and also to colleagues at the Aerotoxic Association for their help in gathering and compiling this data.

APPENDIX

A selection of crew comments

Cabin crew

- i. Since I started flying I have never felt so unwell. My quality of life has changed beyond recognition. My personality was always joyful and positive—I am so negative now and cannot shake off an impending sense of doom. I have constant headaches and cannot stop crying.
- ii. I feel horrible all of the time and have been otherwise healthy and active my whole life. Over the last four years I have had Bell's Palsy and vertigo—simultaneously for 6 months now; more recently Brown's syndrome with double vision.
- iii. I live in a constant state of confusion, somewhat like attention deficit disorder (ADD) and Alzheimer's combined. I feel betrayed by my company.
- iv. I suffered an air quality incident and have been out of work for 20 months. Very little improvement—having trouble getting my bills paid and very depressed.
- v. We were working a flight this year on which passengers complained of numerous headaches. A

- vi. passenger threw up. I started feeling confused, went to the bathroom and was sick myself. I find my symptoms are worse on the B777. The memory loss and lack of ability to concentrate is debilitating particularly if I am Senior Cabin Crew Member on the day. I also find my kidneys affected and my vision distorted. Dizziness and headache are a sure thing. I often feel intoxicated and can't form sentences easily. I like to think that, having a first degree, I'm reasonably intelligent and yet more often than not on the B777 I feel almost retarded in flight. It really upsets me and then I get depressed that it affects me this way on *every* single trip!
- vii. Within 5 hours of flying my entire body begins to ache and movement is extremely painful.
- viii. Previous good health changed when I started flying. I now suffer from asthma, skin rashes, food reactions, constant eye irritations etc. I am getting closer to retirement and no longer fear repercussions from airline management.
- ix. I've had recurring insomnia ever since I started working. My memory is also very poor for a 29 year old woman.
- x. When I was off on maternity leave for 18 months with no flying I had no symptoms.
- xi. The constant fatigue and exhaustion I feel have greatly affected me over the last year, to the extent that I have no quality of life.
- xii. I have been involved in two air quality incidents in the past 7 years. I have experienced significant memory loss since the second one.
- xiii. I was treated as a liar by my airline with regards to all of my symptoms due to the fact that I constantly made complaints about the smell of vomit/oil in the passenger cabin of each aircraft.
- xiv. I was off work for 3 months, diagnosed as having a transient ischaemic attack (TIA). It all went downhill from there. I do not smoke, drink alcohol and am not overweight. I was in good health and exercise. I suffered from debilitating nausea, diarrhoea, vomiting and lacked energy and appetite. The doctors could not figure it out either—I was given all kinds of tests and they also found two tumours in my brain. I went back to work for about 4 months and then got some of the symptoms again.
- xv. I feel that my health is quickly deteriorating. I fly on prescribed antidepressants and have less stamina and more short spells of sickness than ever before.
- xvi. I have been very, very ill for the 5 years and more. I have been very shabbily treated by my manager. There have been days I couldn't have told you

- what my name was! I suffer the most horrendous pain in my joints and muscles.
- xvii. I've had blood tests showing high levels of petroleum-related chemicals, nickel, cadmium and damage to enzymes and mitochondria, and neurological tests showing some damage to nerve endings.
- xviii. The flight deck seems generally unwilling to report or investigate fumes. I suspect that captains are being discouraged from using the reporting procedure.
- xix. Regular blood tests appeared to show that the composition was more abnormal after my working month and generally improved the month I wasn't working (part time).
- xx. Four years ago I became ill with a bad wheezy chest, which I ascribed to—maybe—a 'flu virus. I had never had 'flu before and rarely catch a cold. This illness lasted from March until I ended up in hospital in July. Asthma was diagnosed. I firmly believe it was caused by flying as these symptoms still affect me sometimes when I am on an aircraft.
- xxi. Constant tiredness and lack of co-ordination. Unable to think clearly, cannot concentrate.
- xxii. I started flying in 2006 with a charter airline. Experienced some numbness in toes after approx. 6 months of flying on the A330. Feeling of numbness faded away during 6 months away from flying. I then moved to BA. About 6 months ago the numb feeling came back along with intermittent muscle pains, always in the 24 hours after a long haul flight. I was referred to a neurologist by my GP, who found no signs of any muscle condition.
- xxiii. Midwife said she could not believe how many problems I had for my age (26). It was quite unusual.
- xxiv. Twice within the last 6 months I've operated back to base horizontally, having spent the previous 24 hours with nausea and vomiting. These incidents have not been officially reported. Both times I was operating on the B777.
- xxv. Am off sick at the moment with unexplained pains in my chest and back, pains in my arms, out of breath by just going up the stairs, am seeing a thyroid specialist as blood tests show high level of hypothyroidism.
- xxvi. I often feel vaguely unwell on the B777—dizzy and prone to headaches. Can quite often detect a faint acrid smell in the air.
- xxvii. Since operating on B777 aircraft I have suffered increasing respiratory problems (shortness of breath on board) and nose bleeds.
- xxviii. Unable to physically get out of bed some days ... severe pain in arms and legs, chronic fatigue and struggle some days to remember my name. Typically after working sectors I felt as if coming down with 'flu. Remember quite often smelling fumes in bunk areas on the B747 during crew rest.
- xxix. I go to work sick so that I won't get pulled up by my manager. I love my job to pieces but I have put my name down for part time as my body has changed so much since I started flying.
- xxx. Diagnosed with aerotoxic syndrome. BA have denied any problems. Have noticed continued fuel smell on the B767 on push back.
- xxxi. There is such a fear of reporting sick that many crew go in to work when they should not. I feel constantly tired, I also find that I often come down with sore throats and cold symptoms, particularly after being on the B777 aircraft. The crew often feel tired, dehydrated and sickly on this aircraft.
- xxxii. I have had the worst symptoms on the Boeing 777 and 767. After about 10 minutes on board my nose and throat feel swollen and dry and I have severe dehydration. I no longer fly longhaul. On B777s regularly for about one year I suffered terrible sleep disturbance, depression, mood swings and a general feeling of being detached from life. I am also extremely worried about the numerous cases of cancer and infertility people suffer in this job and feel strongly that thorough research needs to take place.
- xxxiii. I experienced toxic fumes on the Airbus 319 about three years ago, did not know what it was at the time until I saw a television programme on toxic fumes—I had all the symptoms: sore eyes, nausea, hard to breathe, flight deck on oxygen feeling the same, company telling us if symptoms continue to go to hospital.
- xxxiv. Despite being constantly sick with numerous complaints, because of the draconian sickness policy at British Airways I am scared to call in sick and so go to work ill, so my body just seems to get worse and worse.
- xxxv. Since flying on the B777 I mostly feel short of breath, exhausted, with aches in feet, legs and back, dry skin and nose bleeds, and after flight constant sneezing. I have now been told my thyroid is failing.
- xxxvi. Over the last two years I have had bouts of vertigo, which have increased in length each time. The last attack lasted for 7 weeks. On some occasions this has led to sudden loss of vision and blurred vision.
- xxxvii. I have administered oxygen to myself on landing as

- I felt so dizzy and out of breath, I also know that many of my colleagues are sneaking puffs of oxygen as they feel faint, out of breath and dizzy but have already been sick so often they are afraid of reporting sick for duty due to airline supervisors' pressure and lack of sick pay.
- xxxviii. Ever since I started flying I have noticed that I experience extreme fatigue after flying duties. I have also suffered ongoing sinus problems and an increase in contracting cold and 'flu viruses. Over the years I have noticed an impairment in simple mental processes such as memory, mental arithmetic and sometimes even finding the words to speak! Before flying I considered myself fairly intelligent and articulate (educated to degree level).
- xxxix. I collapsed at work and was rushed to hospital after landing. I had been on the B777.
- xl. The B777 is particularly bad. On every single trip on this aircraft I have at least one nosebleed and my eyes are always bloodshot. This takes about 24 hours after operating to clear.
- xli. Over the years my memory has become worse in all areas. I find it difficult to concentrate, I suffer more frequently from dizziness and imbalance. I find it more and more difficult to find the right words.
- xlii. The company I work for are constantly telling me that I am the only one with a problem, but I know of others who are too afraid to speak out. Two flight crew have been incapacitated recently. My GP is worried about my health. I was made an example of last year as I kept reporting problems and submitted an Air Safety Report. This led to me being grounded for 6 months—presumably as a warning to the other crew to keep quiet! Also, the flight crew will not put anything to do with fumes in the tech. log.
- xliii. Have had 2 fume events so far within a year, both on old Airbus A320s during engine startup.
- xliv. Under specialist surveillance for very poor memory, hospital said there is strong evidence of quite rapid memory loss/deterioration without any underlying reason that they could find.
- xlv. My skin condition (a type of eczema), which appeared 3 years ago out of the blue, has started coming back, which is strange as I had been off for 15 months on maternity leave, during which the skin problem seemed to have cleared, but since going back to work three months ago it seems to be returning.
- xlvi. All my allergy and auto-immune tests have come back negative. My consultant says he believes I am an “intrinsically healthy person” and all my health problems have been caused by “external factors.” My GP believes all my health problems have been caused by flying and has written aerotoxic syndrome on my medical certificate.
- xlvii. Never been so ill since started flying. Had operation to clear sinus. Diagnosed asthmatic. Blocked ears. Chest infection approx. 5 times. Diagnosed to have allergies. (Have been flying 2 years.)
- xlviii. I started to suffer constant headaches whilst flying on shorthaul for just over a year. Most days, especially on early morning flights on the B757, we were subjected to a lot of fumes in the cabin and when asked we were told by the flight deck that it was normal upon APU startup. My IBS/headaches, along with very weak legs, just got worse. A few years later I suffered a brain haemorrhage and I had to have 2 operations. Every day I still suffer from headaches and severe back/leg pain. I have now been given a walking stick, a blue badge and was awarded DLA due to my health and mobility problems. I used to be a fit, healthy and vibrant person until I started my flying career, I feel like an old lady now but I'm not! (Aged 37.)
- xlix. Up until now I presumed that the symptoms were just part of flying and the lifestyle. (23 year-old who has only been flying 2 years and has developed tremors.)
- i. Constant tiredness and lack of co-ordination. Unable to think clearly, cannot concentrate. (35 year-old In Charge Crew Member on long haul aircraft.)
- ii. Am now considering leaving flying as I am so fed up of feeling tired and unwell.
- iii. Have had quite severe headaches over the last 10 years when flying on the B757.
- iiii. Was diagnosed as asthmatic last year after a bout of feeling ill, with a severe cough and chest infection which continued for months.
- lv. Heart palpitations after flights for the last 15 years.
- lvi. The dizziness and nausea are now occurring on virtually every flight on the B777. During the last flight I operated I ended up secretly using the oxygen as I felt so light headed. I rarely feel 100% well.
- lvii. I have been diagnosed with depression since 2004 and take regular medication, I have headaches on a regular basis, nose bleeds when flying on the Boeing 777. I have had no feeling in the left of my right hand and little finger for some years. I take sleeping tablets every night and go through phases of not being able to get out of bed. I have a fear of

- going out and, although I do, I prefer to stay indoors where I feel safe. Bouts of diarrhoea come and go. I become very anxious when alone in hotel rooms, I end up in floods of tears.
- lvii. Even when feeling ill I have to go in to work, otherwise I fear “they” will manage me out of my job.
- lviii. Progressive idiopathic neuropathy in my feet started about 10 years ago and is now beginning in my hands.
- lix. Due to sickness policies introduced over the past two years, many crew now feel pressurized to fly when they are not 100% fit.
- lx. I was diagnosed yesterday with severe hypertension. Treatment initiated immediately and off work now.
- Pilots*
- lxi. No will to continue or take part in the flight, short term memory problems, word-finding difficulties, a general slowing down of reactions and thinking times, a tingling in my finger tips. I also drove down the wrong side of the road twice, just after filling up with petrol and smelling the fumes. One day on the flight deck I breathed in a lot and suffered mentally for the short remainder of the flight. I then discovered, through a colleague, exactly what organophosphate (OP) poisoning is. On reading up I found I had many of the symptoms. I am still flying even though my company knows I am claiming to be poisoned by OPs. I ensure that whenever the aircraft smells, I use a combination of speedbrake and power that prevents idling and acts to prevent the fumes entering. I am putting my, and my passengers’ health ahead of fuel economy. My health is permanently affected but I feel there is little I can do to prove it.
- lxii. I recently experienced several fume events on Q400 aircraft within the last month, three cabin crew were affected. After repeatedly grounding the aircraft, eventually the airline I worked for boroscoped the engine and found oil traces in the compressor and oily water in one of the air conditioning packs. The engineering investigation found a leaking labyrinth/bearing seal and the aircraft is now having an engine change.
- lxiii. Multiple events of oil fumes in flight deck on start up in the A340-500 plus one severe fume event causing immediate aerotoxic symptoms. Rolls Royce carried out a fleetwide modification to front engine oil seal and most fume events stopped. Management and medical department refuse to acknowledge aerotoxic syndrome is a potential problem and provide information to crews.
- lxiv. I have suffered these symptoms increasingly over the last few years and recently experienced a fume event. I am wondering if any research into the *cumulative* effects of constant exposure to small amounts of organophosphates has been conducted.
- lxv. Flew the BAe 146 1997 to 2000—was poisoned by contaminated air. Lost job and stopped flying for several years. Regained licence in 2005, poisoned again by contaminated cabin air in 2006. Again lost job and stopped flying for several years. Have just regained licences and now plan to stay in GA so contaminated bleed air poisoning is not a possibility.
- lxvi. The UK CAA withdrew my pilot Class 1 medical certificate in 2006 since I was found to be long term unfit, due to “cognitive and autonomic impairment ... this impairment may have been caused by exposure to cabin fumes.”
- lxvii. Lost consciousness during the flight and was brought to the hospital. An Air Safety Report was filed and the aircraft (a BAe 146) air conditioning was checked for oil contamination. It was found that the pack contained fresh engine oil! 5 years later I still have some symptoms, which keep me from the normal life I used to live. Before I started my flying career I used to be a long distance runner and did a lot of sports, never smoked in my whole life.
- lxviii. I have experienced several smoke events on the Airbus fleet. On cold mornings before the first flight of the day, oil pools develop in the engine from contracting oil seals. Some of this oil burns and creates a large plume of blue smoke, which is distributed first to the pilots and then to the rest of the cabin. The other source of toxic smoke is oil seeping from pack seals.
- lxix. My first apparently inexplicable symptom occurred 9 years ago when I experienced strange thought patterns, feelings of detachment and confusion. At about the same time I developed a heart arrhythmia which grounded me for a year. I was seen by an airline doctor, two heart specialists, an internist and my family doctor—after a battery of tests no one was able to diagnose the problem.
- lxx. I experienced a smoke event within the cabin during take off. Both pilots donned oxygen masks as a precaution. The flight was turned around and landed safely in 9 minutes. Neither my First Officer nor I had any symptoms but I did admit one flight attendant to the hospital later that night for toxic fume symptoms.