

[time 00:00] **CLAUDIA HAMMONDS (CH):** Hello, I'm Claudia Hammonds. Thanks for downloading the '*All in the Mind*' podcast from BBC radio 4. This week, a story that will interest anyone who lives under a flight path, a tale of redemption, and some new research which might mean the psychology textbooks need rewriting yet again. Here's the program:

[time 00:17] **(CH):** The sun might have been tempting you to eat outside in the last few days. But maybe you live in a part of the country where your barbecues are blighted by aircraft noise, and where you're woken in the morning by the roar of planes overhead. Some people insist that the noise affects their mental health.

[time 00:33] **Chris:** It's the disturbance that it causes to your life and your well-being. Soon I realized I was in trouble, I was reacting to it. Not to the extent that I had to be hospitalized, but certainly to the extent I had to actually get help for it.

[time 00:48] **(CH):** The evidence for the link between aircraft noise and depression has been patchy. But now a new study suggests there is a link, but a rather curious one.

[time 00:57] **(CH):** Sometimes a single individual can turn around someone's life. Today we have a story of redemption, the '*All in the Mind*' award finalist who spent 26-years in prison before meeting the support worker who changed everything for him.

[time 01:11] **(CH):** And, if you've ever stuck your tongue out at a young baby and watched it copy you back, you've observed early imitation, a key concept in developmental psychology. But, is a new study about to overturn what psychology textbooks have been telling us for years?

[time 01:27] **(Catherine):** That was quite sensational to think that newborn babies could come into this world and understand their bodies, understand actions that they are able to produce to match other people, and up until this point we take it as fact that newborns can imitate.

[time 01:40] **(CH):** And welcome to my guest today, Doctor Catherine Loveday, a cognitive neuroscientist at the University of Westminster. Now, on the news today Catherine, people might have heard about the discovery of a blood test which can test to see which antidepressants might work for a particular individual. It sounds quite extraordinary. The work's from Kings College, London. How does this work?

[time 02:02] **Catherine:** Illness is the holy grail of psychiatry, really. It's trying to find a biological measure for what is essentially a psychological condition or psychologically experienced condition. Um, so what they've done here is that they've actually found this marker. They've found that there are high levels of these two substances, which occur in everybody but above this particular threshold they seem to indicate a different type of depression or a different severity of depression, which means that people respond differently to the antidepressants. So I think this has really important implications for, both the way that we treat depression, but also what the biological mechanisms underpinning depression might be.

[time 02:43] **(CH):** And so sometimes people will try one type of antidepressant and wait weeks and weeks, and sometimes months, to see whether it has any effect. And then if it doesn't, move onto something else. So, this could really make a difference, people could make - if you could work out straightaway what type of drug they might respond to.

[time 03:00] **Catherine:** I think the difficulty with these drug treatments for depression is that they do take a long time to kick in, and I think it's something that always puzzles people. The

drugs don't have an immediate effect. They take two to three months sometimes to really impact. So, it's very difficult if you're trying to decide on a treatment, someone with depression. You've got to wait, you know, maybe three to four months to know whether that's actually kicking in and whether it's going to make a difference. And so the idea with this is that you could jump ahead of some of that if you just – test indicates that you're not going to respond to the drug very well, then we can move forward and try a different type of treatment

[time 03:37] **CH**: Now this is just an initial small trial at the moment, isn't it? What would have to be done before this could be available more widely?

[time 03:44] **Catherine**: Now, I think it just needs to be tested on a much wider, larger group of people before we can draw any really big firm conclusion. But it's, I think, really exciting work.

[time 03:53] **CH**: So, might this suggest that there are different types of depression, if some people will respond to say SSRIs, a very common form of antidepressant, and other people won't at all, because of this information is going on?

[time 04:06] **Catherine**: Yeah, and that was one of my first questions about it, really, is whether this is just a mark of severity, how bad the depression is, or whether it may indicate different routes by which that depression has come about, so different underlying causes for the depression.

[time 04:19] **CH**: Thanks, Catherine, and do stay with us. Now, I live on a street where there are some planes overhead, but they're quite high and they don't bother me that much. But for those who live directly under flight paths, the noise can cause annoyance, affect sleep, and even affect cardiovascular health. But what about the impact on long-term mental health?

[time 04:37] **CH**: This is a sensitive topic, which is coming to the fore with the current redesign of many flight paths in the UK, as part of a strategy to improve the efficiency of flight routes, and to allow our skies to accommodate more planes in the future. As a result, some communities, often miles away from airports such as Edenborough, Heathrow and Gatwick, have woken up to find themselves under new flight paths, often in intense narrow corridors. Next month sees the UK's first public seminar to examine aviation noise and mental health.

[time 05:08] **CH**: So, what is the evidence when it comes to airplane noise and depression? I asked Charlotte Clark, reader in environmental and mental health epidemiology at Queen Mary University of London. She told me that so far it's been patchy, and that most studies have only looked at short-term factors, such as disturbance and irritation.

[time 05:27] **CHARLOTTE CLARK (Charlotte)**: "Yeah, well when you start to look at it, there's lots of evidence for annoyance, and this is really what policy-makers and airports have focused on. We've done a lot of work trying to focus on how we measure annoyance, and we know that that's quite well understood. But, actually we're now starting to think, do we need to unpack what we think of as annoyance. So you tend to ask, 'are you bothered, disturbed or annoyed by it?' We know that you get different responses, so younger people less annoyed, older people less annoyed, also young people less sensitive to noise, particularly aircraft noise."

[time 06:01] **CH**: You've been attempting to draw together all the data on how aircraft noise might affect our mental health. How much good research is there out there?

[time 06:09] **Charlotte:** Oh, I wish there was more. I think that we've really been trying to look at this. Of course we think it's important for mental health. But actually, the data, if you want to get really good studies of this, is not so good at the moment.

[time 06:20] **CH:** Why do you think that is? Why is it being neglected? It seems like an important topic, an important topic when decisions are being made about airports.

[time 06:27] **Charlotte:** Yeah, and I think important topics like this often fall into the category of people who will say, 'well don't we already know that', for one, which makes it very difficult. We hope to protect the precautionary approach that we think that is important. But actually, then as a researcher, that gets really difficult to actually get research funded, and that's a sort of Catch 22 a bit, I think.

[time 06:47] **CH:** So until now, when it comes to the long term effects, we've had to rely on anecdotal evidence. Chris lives several miles from Heathrow Airport, and was used to some flights passing his home. But two years ago he was woken by noise and discovered that there was a new concentrated flight path right over his house, and that from now on there would be regular interruptions to his daily existence.

[time 07:10] **Chris:** I had moved there, or we'd moved there, to destress our lives, and what – and this was the last thing we kind of wanted, because it was intrusive into our lives. We didn't ask for it. The airport had come to us. (long pause for jet noise)

[time 07:29] **Chris:** It actually blights your home. It's the intrusion, principally, it's the disturbance that it causes to your life and your well-being, and it's difficult to relax. We're on edge subconsciously, to some extent. There's an anticipatory element to it, when you didn't know quite when they were going to stop or when they were going to start again. And you then find out that you're actually powerless. You have no power to deal with it. You can't control it. (long pause for jet noise)

[time 08:04] **Chris:** I'm meticulous in trying to get well, and doing everything I can to ensure that I do. And very soon I realized I was in trouble, I was reacting to it. I was actually in a process of despair because, I think if you work through a whole cycle - there is a cycle from, you know, perhaps despair, anger, frustration, whatever you want to call it, a whole series of stages. And then you end up, and you realize you cannot do anything. It's hopeless. And when there's no hope, that's when I think you become depressed, and that's when I was finding I was slipping back. Not to the extent that I had to be hospitalized, but certainly to the extent I had to actually get help for it.

[time 08:51] **CH:** So how common is Chris' experience? Well, at last, a long term study has been conducted, following a million people living near Frankfurt Airport over five years. It's called the NORAH study, and the project leader is epidemiologist Professor Andreas Seidler, from Dresden University.

[time 09:11] **Dr. Seidler:** We did find a steep increase in the risk of developing depression for people that are exposed to moderate aircraft noise levels. Moderate noise level - that means noises around 50 to 55 decibels. That is about the noise of having a conversation at home. So, not very loud noises. Particularly, if you think about that these noises were measured outside the house. So, if there is aircraft noise outside that is about as loud as a conversation at home, that already leads to a 17% increase in depression risk, according to our studies.

[time 09:55] (CH): Now, this is correlational data, isn't it? So, we can't know for certain that it was the aircraft noise which led to the depression.

[time 10:02] Dr. Seidler: That's right. It is a case-controlled study. We try to adjust for potential confounders. But, for sure, there has to be further research and see if depression is really caused by traffic noise.

[time 10:20] (CH): Nevertheless, your results are quite distinct from analysis of this five years' worth of data. You've reported a dose-response relationship, between aircraft noise and depression. So for each 10 decibel rise in noise levels above that conversation level you mentioned of 50 decibels, the risk of depression goes up by 9 percent. But then something curious happens; when the noise gets really loud, the rate of depression seems to go down again. Why's that?

[time 10:46] Dr. Seidler: We also were surprised about this finding, but we think that could have something to do with coping behavior. Highly annoyed people might move away from areas with very high aircraft noise levels and, on the other hand, rather noise-insensitive people might not get a depression, even from high noise levels. We know such a phenomenon from occupational medicine. When particularly healthy, robust people work at particularly stressful, exposed workplaces, we call this a healthy worker effect. So, our decline in depression risk for very high aircraft noise might be explained by a kind of healthy resident effect.

[time 11:32] (CH): And I wonder whether perhaps what we need are better ways of assessing how annoying a sound is, rather than just how loud it is. Do we need more precise measures, if you like?

[time 11:42] Dr. Seidler: Right. It's not only noise level but, I think, it's other noise characteristics. One very interesting finding of our study was that even people living in very quiet environments, but that are exposed to a few single loud events at night – just a few planes flying above them – even those people have increased risk of developing depression or of developing cardiovascular diseases.

[time 12:12] (CH): Now the Aviation Environment Federation has concluded that, with this new research of yours, the evidence base is improving, but is still classed as insufficient in total. It sounds as though there's still more we need to know. Would you say that?

[time 12:26] Dr. Seidler: I think so. You rightly said that, that it's inconclusive research until now. So, our study is the first very large study that finds a clear relationship. So we have to know more.

[time 12:42] (CH): And there are many people presumably who will not develop depression, who live with the noise, it's just that the risk is increased.

[time 12:49] Dr. Seidler: That's right. However, it's more than 10 percent of all people that develop depression. So it's a very frequent disease, and so low-risk increases are of public health relevance.

[time 13:03] (CH): Andreas Seidler. Catherine, were you surprised that so few studies have been done on this?

[time 13:07] **Catherine:** Yes, although I think they're difficult studies to do, because you have to wait for an opportunity. We obviously can't expose people to these high levels and wait for them to get depressed, you know, deliberately. So we have to look for naturalistic opportunities, and those are very hard to control. So, I think it's hard research to carry out, but I think it's absolutely vital. And I'm probably quite biased when it comes to this, because I can't bear – I literally can't bear any noise at all when I'm trying to sleep or trying to work.

[time 13:36] **(CH):** Well, Chris mentioned anticipating when the planes might come. Can you see how a preoccupation with noise like this would take its toll on the brain?

[time 13:44] **Catherine:** Yes. I think for various reasons. One is that during the day, when you're trying to focus on something, I think it increases your cognitive load. It's something to think about; it's something to try and ignore; it's something to try and – it just takes up brain-space.

[time 13:57] **(CH):** And I guess that's the issue, isn't it, that you've got no control over the noise, and so that makes you feel helpless. And we know that helplessness can be associated with depression.

[time 14:04] **Catherine:** Stress in and of itself is difficult to deal with, but when you can't, when you've got no way of controlling that or doing anything about it, we know that has a much more significant effect on people's brain and their mood and their health and everything.

[time 14:18] **(CH):** Thanks, Catherine. And for details of the public seminar coming up on aviation noise and mental health, do go to the '*All in the Mind*' webpage. [time 14:25]

Transcription created on 6/10/2016, from file copied from: <http://www.bbc.co.uk/programmes/b07dlxxw>
(Highlights, footnotes and minor edits may have been added by aiREFORM)