

Summary Report of the Webinar on Night Flights

21 October 2021, 18.00 – 19.00

1. Dirk Schreckenber: The impacts of night flights on health

See [presentation slides](#)

Health effects of noise:

1. Hearing related, such as hearing impairment or tinnitus;
2. Stress related:
 - a) Short-term effects, such as physiological activation, annoyance, sleep disturbance, disruption of activities, disrupted communication;
 - b) Long-term effects, such as annoyance, sleep disturbance, cardiovascular disease, metabolic disease, mental health problems, cognitive development in particular in children.

The **WHO 2011** Environmental Burden from Environmental Noise report estimated the healthy (disability-adjusted) life years (DALYs) lost per year in Western Europe due to transportation noise, which includes air plane noise:

Health effect	Number of DALYs lost
Sleep disturbance	903.000
Annoyance	587.000
Ischaemic heart disease	61.000
Cognitive impairment of development of children	45.000
Tinnitus	<u>22.000</u>
TOTAL	1.618.000

Thus, from the 1.6 million DALYs lost, over 900.000 (= 56%) were due to sleep disturbances.

The **WHO 2018** Environmental Noise Guidelines for the European Region identified

- Five critical health outcomes:
 1. Annoyance;
 2. Sleep disturbance;
 3. Cardiovascular diseases;
 4. Cognitive impairment;
 5. Hearing impairment and tinnitus.
- Two recommendations for the noise exposure level:
 1. $L_{den} = 45$ dB, sound level for the day, evening and night (= an entire day);
 2. $L_{night} = 40$ dB, sound level for the night.

Long-term effects of night-time aircraft noise

A study of Porter et al (2000) identified, as consequences of night-time aircraft noise,

- acute responses such as awakening and acute annoyance;
- total night effects such as sleep fragmentation and reduced sleep duration;
- next day effects such as sleepiness and performance decrements; and
- chronic effects such as physical and mental health effects leading to chronic annoyance and a reduced quality of life.

The HYENA study from Järup et al (2008) found that night-time aircraft noise increases the risk of hypertension in the long term.

A study of Münzel et al (2021) identified a number of stress-related, long-term adverse health consequences of night-time aircraft noise, including

- depression, annoyance;
- cardio metabolic diseases (hypertension, atherosclerosis, insulin resistance, obesity); and
- blood vessel diseases (RAAS activation, vasoconstriction, inflammation, oxidative stress).

A further study of Münzel et al (2021) showed that night-time aircraft (and railway) noise increases in the long term the

- sympathetic activation, which is a physiological stress response;
- blood pressure, which is a risk factor for heart diseases;
- arterial stiffness which is an indicator for atherosclerosis; and
- markers for oxidative stress and inflammation, which are risk factors of metabolic diseases.

Noise effects on sleep

Noise has been shown to

- fragment sleep and reduce sleep continuity;
- reduce sleep duration.

We need 7 to 9 hours of sleep per night in order to recover. We may awake several times per night without noticing and thus being unable to self-report such awakenings on the following day. Night-time noise will however lead to additional awakenings when the body is not ready to awake. This leads to disturbances and physiological reactions.

It is important to also take account of the (maximum) noise level during single noise events, not only of the average noise. For example, an average $L_{\text{night}} = 38.3$ dB can result from a LAS, max of 66 dB(A) at each of 4 single events, 63 dB(A) at each of 8 single events, or 60 dB(A) at each of 16 single events..

The case of Frankfurt Airport: New runway and implication of a night flight ban

In October/November 2011 an only 6 hours night flight ban from 23.00 to 5.00 h was put in place at Frankfurt airport, called 'mediation night'. Residents however protested, since they had expected a real ban on night flights. This led to a court decision in 2012 that a total ban on night flights should be implemented. Finally a night-flight ban called 'realistic' by the authorities was put in place: flight ban from 23.00 to 6.00 h + a less frequent use of certain runways during the

'shoulder hours': from 22 to 23 h two northern runways are used less, from 5 to 6 h two southern runways are used less. Nevertheless, 17 flights are still allowed during 23 to 5 h.

The authorities' manoeuvres led to distrust in the population who now request a flight ban for the whole of the night.

Did sleep disturbances decrease due to the night flight ban at Frankfurt airport? - NORAH study

Self-reported sleep disturbances

- did basically not change during 22 to 23 h;
- decreased during 23 to 5 h for noise levels of $L_{pAeq} > 42.5$ dB, but remained unchanged for lower noise levels;
- increased slightly during 5 to 6 h, perhaps due to the preceding quiet night.

The physiological sleep quality did virtually not improve before/after the implementation of the night flight ban.

2. Martin Kessel: Effects of the night flight ban

See [presentation slides](#)

A night flight disturbs the 8 hours of rest and sleep recognised by WHO as time to recover. Clinical studies confirm evidence of health risks caused by night flight noise.

With a night flight ban, the night flights concerned have to be 'squeezed' into the day.

In Frankfurt we had our own night flight control system: As soon as a single flight infringed the night flight ban by one minute, we protested before the authorities.

No airline went bankrupt because of the night flight ban at Frankfurt airport. On the contrary, Lufthansa cargo expanded its facilities at Frankfurt airport despite the night flight ban and made a EUR 1 billion profit in 2021.

A night flight ban is a business restriction just as any other restriction applied to the aviation business, such as the slots system at airports.

Of the night flight freight, more than 95% are mass transport but no urgent goods. Only 5% are overnight courier freight.

In the EU, 240 airports have no problems with night flight bans, only 25 have such problems. An EU regulation could establish the same conditions for all airports, thus ensuring fair competition.

Night flight bans with a duration of at least 6 hours (23 to 5 h) have been established in Zurich, Geneva, Basel, Frankfurt, Düsseldorf, Berlin, Munich, Hanover, Stuttgart, Paris-Orly and several others.

However 6 hours is too little, 8 hours of sleep are needed. The worst effect comes from noise between 5 and 7 h in the morning.