A PLAIN PERSON'S GUIDE TO THE WORLD HEALTH ORGANISATION'S NOISE AND HEALTH REPORT

The World Health Organisation (WHO) report published on 10th October, updating its earlier noise guidelines, contains a wealth of information. It includes probably the most comprehensive body of research on noise and health ever assembled in one place. It ought to be the driver of future policy on noise. Whether it will be depends largely on how much pressure governments and industry come under to follow its findings. But, first of all, it is important to understand what it is saying – and what it is not saying. This short article aims to be a plain person's guide to the report.

Has this kind of report being published before?
The report updates the guidelines produced by WHO in 1999 and night guidelines it published in 2009.

Does it only apply to Europe?
It applies to all European countries (not just those within the European Union). It was published by the WHO European office but they hope and expect is will influence noise policy across the world.

Who wrote it?
The work was done by WHO staff supervised by some of the biggest names in noise and acoustics. Each section of it was carefully peer-reviewed.

Did they do research of their own?
No, they pulled together and analysed all the research that had been done into noise and health.

Are all aspects of noise covered?
Not quite. It covers environmental noise. It deals with road, rail and air noise and, for the first time, wind farm and recreational noise. It doesn't include neighbour noise.

Are its guidelines legally binding?
No. However, given the extent of the health problems associated with noise that report found, it will be difficult for governments to dismiss the guidelines out of hand.

How big a problem is noise in Europe?
WHO has not calculated how many people are exposed to noise above their new recommended safe thresholds but indicate that it will be between 100m and 200m, the big majority of these exposed to traffic noise. A 2016/17 survey, quoted by WHO, found that 32% in Europe have some problem with noise (rising to 49% in the cities and suburbs) and that 15% rate noise as one of the top five environmental problems.

Is WHO saying over 100m Europeans will suffer bad health due to noise?
The report is not saying that. It argues that the health of a percentage of these people will be affected, the exact percentage dependent on the particular noise source.

What health effects are included?
It looked at all the health impacts for which there is evidence. This included 'annoyance' and 'self-reported' sleep disturbance.

What are the key recommended limits?

Road	**53Lden**	**45Lnight**
Rail	**54Lden**	**44Lnight**
Aircraft	**45Lden**	**40Lnight**
Wind Turbines	**45Lden**	**no recommendation***
Leisure	**70 LAeq**	

* WHO felt that there was insufficient evidence to make a recommendation

What metrics were used?

Lden averages the noise out over an 8 hour day, a 4 hour evening and an 8 hour night, with 5 and 10 decibels added to the evening and night figures respectively to account for generally lower background levels at those times. **Lnight** averages the noise just during the night period. **LAeq**, as used by WHO in this report, is an annual average.

What is the methodology the WHO used?

It can probably be summed up in the word 'bench-marking.' It is critical we know what this means if we are to understand its recommendations. When 10% of people said they were annoyed by a particular noise source (during the day) at a given level, that level became the bench-mark, became health threshold, the new health guideline.

So, for example, the report found that 10% of people were annoyed by aviation noise at 45Lden. This, therefore, became the bench-mark, the relevant health guideline. WHO acknowledged that 10% could be a relatively small number in any one place but argued that spread across Europe it amounted to a considerable number of people and so should be the benchmark. As we'll show in some tables further on, WHO is *not* saying that *most* people will be annoyed or experience health problems from aviation noise at 45Lden. But what it *is* saying is that, in its view, *enough* people will do so for it to be the recommended guideline.

WHO's night time guidelines, generally, are lower because the evidence showed that regular sleep disturbance can have a worse impact on health than annoyance. Therefore the benchmark was set at a lower level. The recommended threshold was the level at which 3% of people were 'highly sleep-disturbed'.

Was the noise measured inside or outdoors?

WHO is talking about levels of outdoor noise. Indoors, the noise can be 10 decibels lower even if the window is open; 15 decibels lower with a half open window; and 25 decibels less if the window is shut.

In the next few pages we look at each noise source in a more detail

What are the ROAD TRAFFIC findings?

Recommended guidelines:

Road **53Lden** **45Lnight**

At present over 100 million people in Europe are exposed to traffic levels of 55Lden and 72 million to night time levels of 50Lnight (both limits higher than the WHO is now recommending). Because WHO found 10% of people are annoyed at levels of 53Lden (and therefore their health might be affected) and the benchmark 3% are 'highly sleep-disturbed' at 45Lnight, these are recommended as the safe noise guidelines.

The levels at which people are highly annoyed by road noise

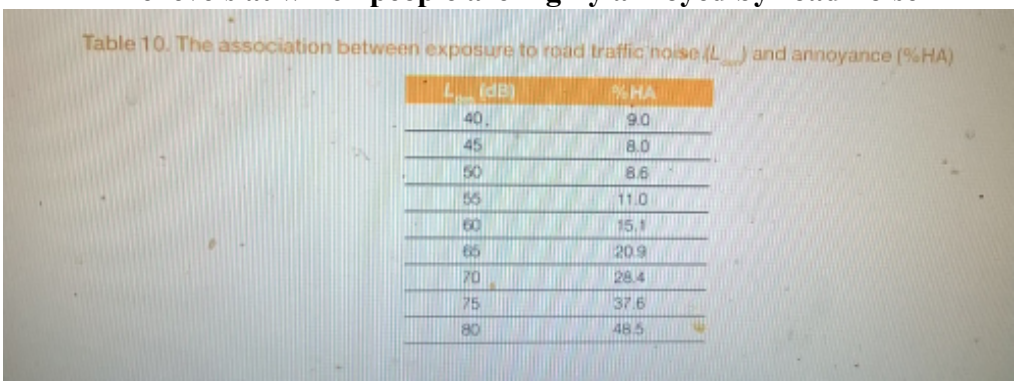

Table 10. The association between exposure to road traffic noise (L_{den}) and annoyance (%HA)

L_{den} (dB)	%HA
40	9.0
45	8.0
50	8.6
55	11.0
60	15.1
65	20.9
70	28.4
75	37.6
80	48.5

These figures show – as do the road and rail ones which follow – that a lot of people are not highly annoyed by noise. But equally they show, and this is the point WHO would emphasise, that, across Europe, noise at relatively low levels is a problem for many people, sometimes to the detriment of their health.

What are the RAIL findings?

Recommended guidelines:

Rail **54Lden** **44Lnight**

At present 17 million people in Europe are exposed to rail noise above 55Lden, with 15 million exposed to night noise above 50Lnight. Because WHO found 10% of people are annoyed at levels of 54Lden (and therefore their health might be affected) and the benchmark 3% are 'highly sleep-disturbed' at 44Lnight, these are recommended as the safe noise guidelines.

The levels at which people are highly annoyed by rail noise

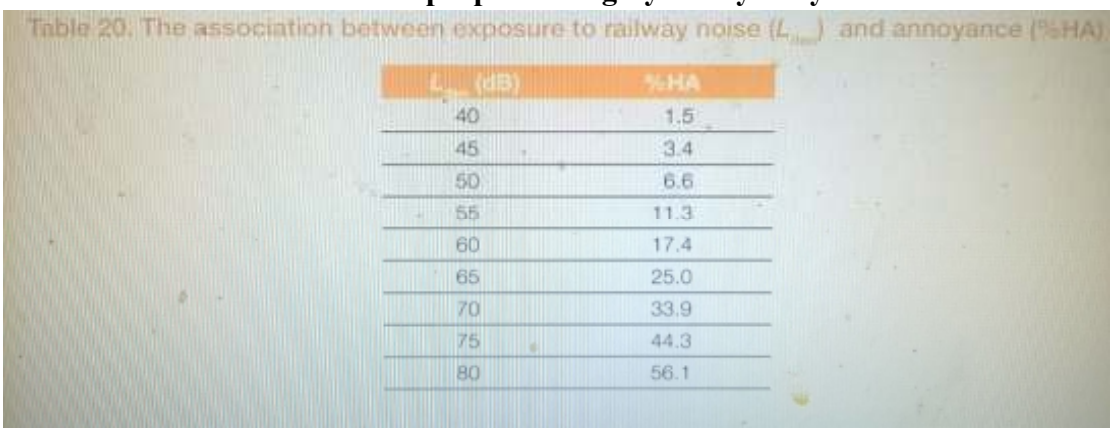

Table 20. The association between exposure to railway noise (L_{den}) and annoyance (%HA)

L_{den} (dB)	%HA
40	1.5
45	3.4
50	6.6
55	11.3
60	17.4
65	25.0
70	33.9
75	44.3
80	56.1

What are the AIR findings?

Recommended guidelines:

Aircraft 45Lden 40Lnight

At present 3 million people in Europe are exposed to aircraft noise above 55Lden, with 1.2 million exposed to night noise above 50Lnight. Numbers would be higher if the new recommended guidelines were to be used but the numbers would still be less than for road or rail noise. However, WHO report confirms that people start to get highly annoyed by lower levels of aircraft noise when compared with road or rail. Because WHO found 10% of people are annoyed at levels of 45Lden (and therefore their health might be affected) and the benchmark 3% are 'highly sleep-disturbed' at 40 Lnight, these are recommended as the safe noise guidelines for aircraft noise.

The levels at which people are highly annoyed by aircraft noise

Table 30. The association between exposure to aircraft noise (L_{den}) and annoyance (%HA)

L_{den} (dB)	%HA
40	1.2
45	9.4
50	17.9
55	26.7
60	36.0
65	45.5
70	55.5

What are the WIND TURBINE findings?

Recommended guidelines:

Wind Turbines 45Lden no recommendation for night

There is a lot less research into wind turbine noise than road, rail or air. There are not reliable figures yet for the numbers exposed across Europe. However, WHO found that, like aircraft noise, people start to get highly annoyed by wind turbine noise at lower levels than road or rail noise. Because 10% of people are annoyed at levels of 45Lden (and therefore their health might be affected) that is recommended as the safe noise guideline for wind turbine noise. WHO has stressed that, because there is not yet enough research to make a recommendation about night noise from wind turbines, it does not mean that they are not causing problems. The WHO has recognised that there is research currently being done which may fill the gap and one of the report's recommendations is that more wind turbine research is undertaken.

What are the LEISURE noise findings?

Recommended guideline:

Leisure 70 LAeq

Leisure noise is harder to define precisely than the other noise sources. WHO is clear that it does not include neighbour noise (the problems with people making noise in

their homes or gardens). WHO broadly defines leisure noise recreational noise, including noise from personal audio devices. There is less conclusive research into recreational noise than other noise sources but earlier work by the WHO found that in 2015 1.1 billion young people worldwide could be at risk of hearing loss due to unsafe listening practices and, among people aged 12–35 years in middle- and high-income countries, nearly 50% listen to unsafe levels of sound through personal audio devices and around 40% are exposed to potentially damaging levels of sound at nightclubs, bars and sporting events. In light of existing evidence the WHO recommended that over the course of the year the noise from leisure sources should average out at no more than 70 decibels. It added one important caveat, though: a warning that very high levels of noise at a particular time – for example music at a rock concert – has the potential to damage hearing.

Does the WHO Report recommend solutions?

Under each section it looks as possible solutions. There are more proven solutions for some noise sources than for others. The report gives the very strong impression that it wants to see its report lead to action.

Our turn now……..

The WHO has done it job. It is over to us now – Governments, industries, communities, campaign groups – to make sure we use it to create a quieter and healthier future.

The full report:
http://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf?ua=1

John Stewart
(author of *Why Noise Matters*)