HOW ENVIRONMENTAL NOISE AFFECTS HUMAN HEALTH

A very brief introduction to the science

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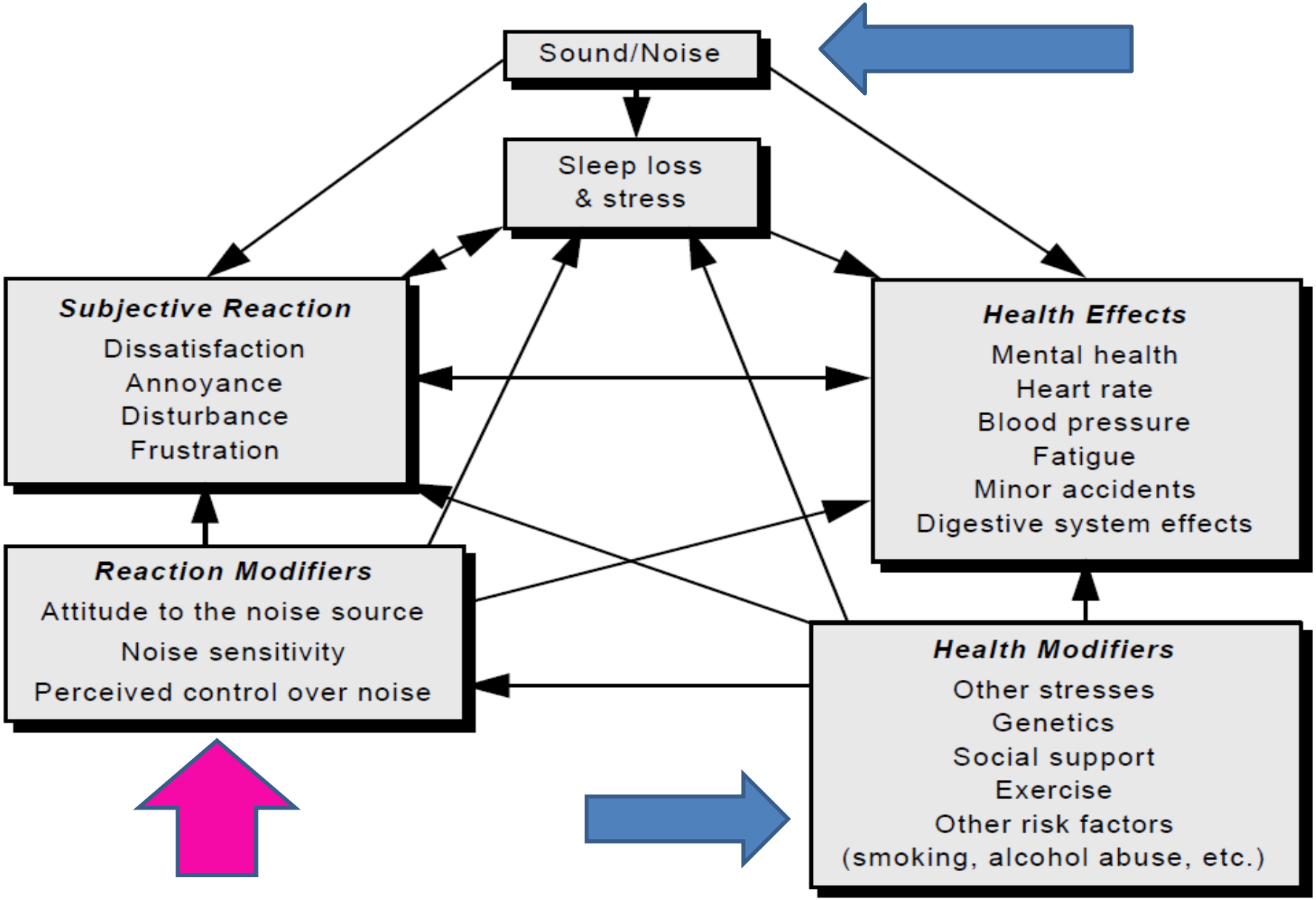

Model of “causal connections” between noise, community reaction modifiers and health effects. From R F S Job. ICA Trondheim. 1995

“Simplified” Noise Reaction Model

Sound exposure

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Disturbance of intended activities

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Stress indicators

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Biological risk factors

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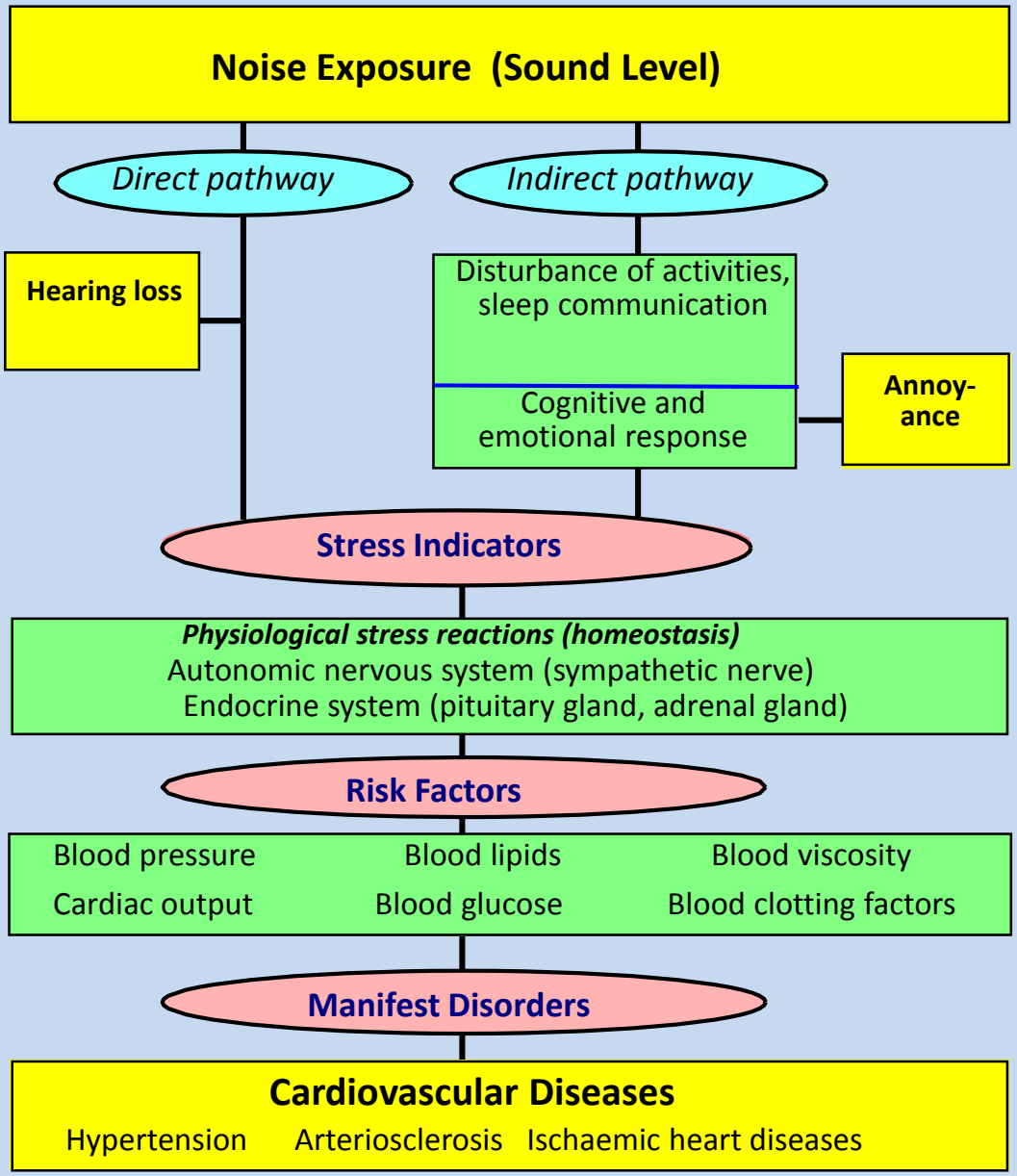
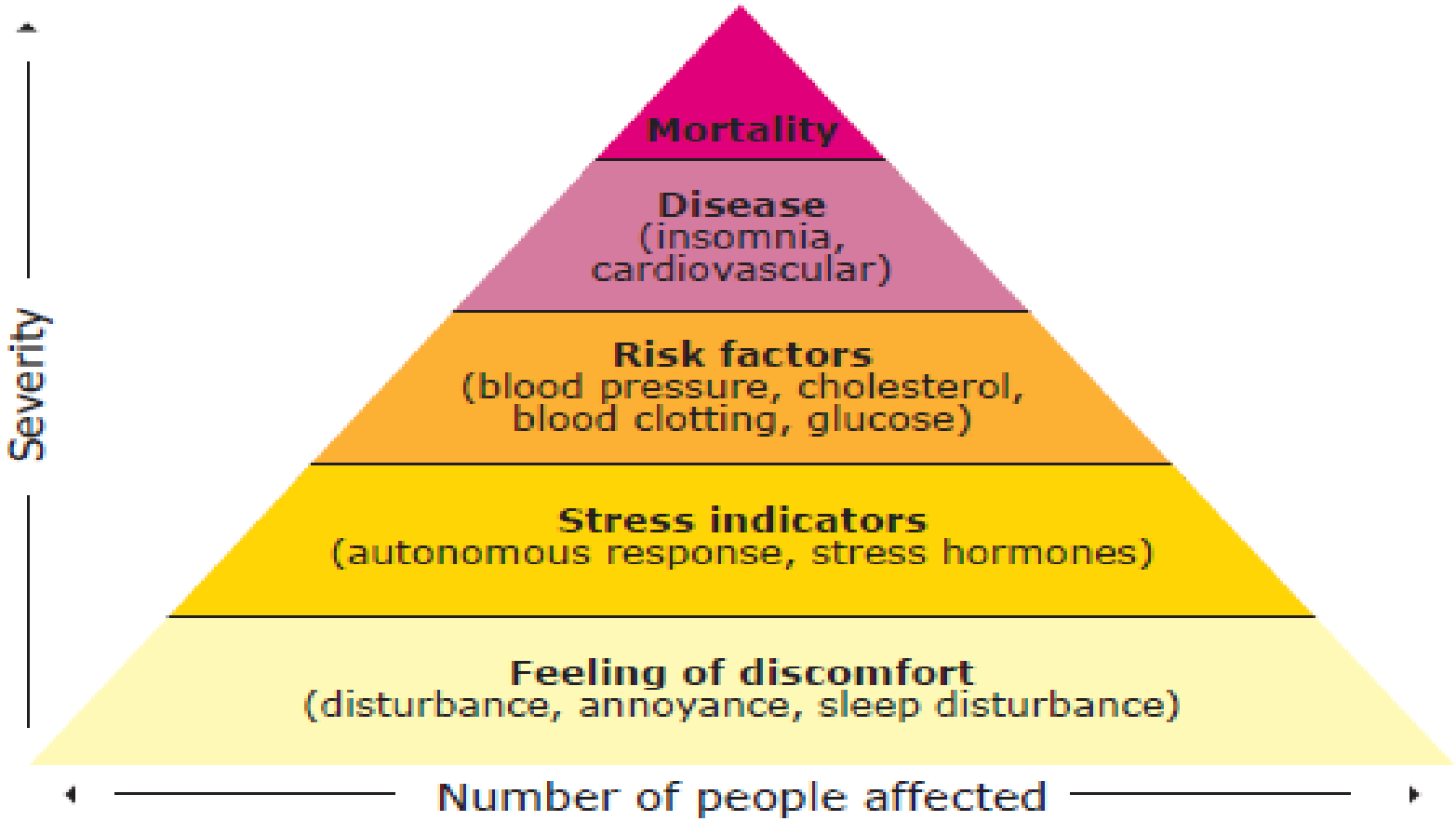
Cardiovascular diseases



Source: Babisch, 2002

Figure 1.1 Pyramid of effects (WHO 1972 — modified)[iv]



Source: Babisch, W, 2002[xvii].

http://www.eea.europa.eu/publications/good-practice-guide-on-noise EEA Tech 11 2010

STRENGTH OF SCIENTIFIC EVIDENCE * FOR VARIOUS EFFECTS OF NOISE

* Using accepted World Health Organisation WHO criteria

IARC evidence categories

International Agency for Research on Cancer

World Health Organization

http://www.iarc.fr/

'Sufficient': a relationship has been observed between noise exposure and a specific health effect . Chance, bias, and confounding factors can be ruled out with reasonable confidence;

"Limited': an association has been observed between noise exposure and a specific health effect. Chance, bias, and confounding factors cannot be ruled out with reasonable confidence;

'Inadequate': the available studies are of insufficient quality, lack the consistency or statistical power to permit a conclusion regarding the presence or absence of a causal relationship;

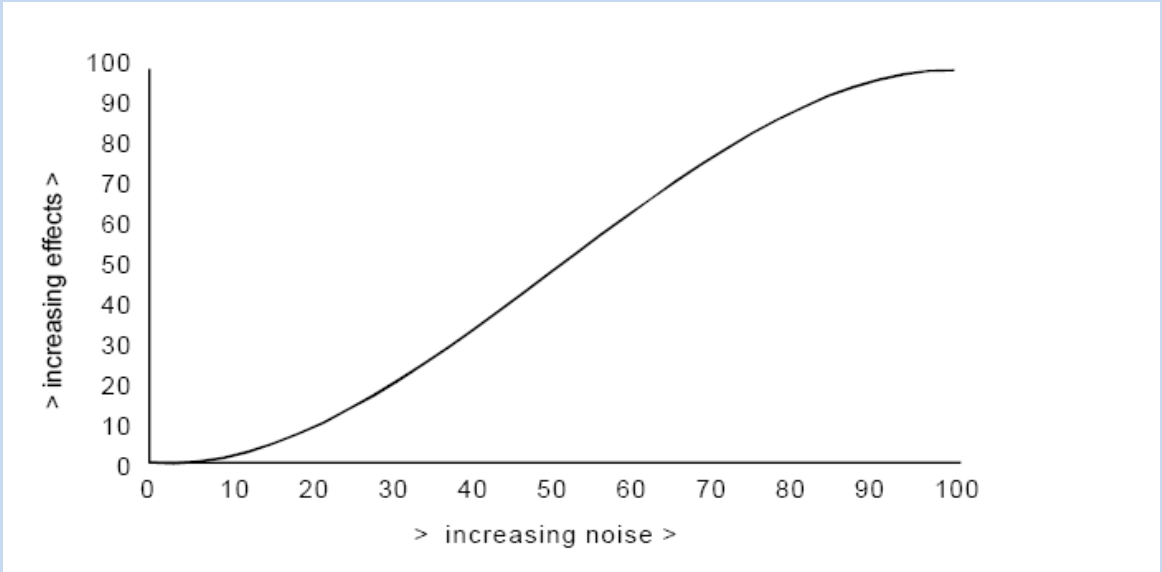
'Lacking': several adequate studies are mutually consistent in not showing a positive association between exposure and health effects

Effect	Strength of evidence	Comment
Annoyance	Sufficient	Complex interaction with other health effects and non-acoustic factors
Cardiovascular – IHD, AMI, hypertension	Sufficient	Importance of; **confounding factors**, e.g air pollution **modifying factors ,** e.g. length of residence
Sleep - awakenings	Sufficient	A certain number of spontaneous awakenings is normal
Sleep – self reported disturbance	Sufficient	Subject to bias
Cognitive performance - reading age	Sufficient	Primary school age only Less evidence for other cognitive effects, memory etc .. Long term ?
Mental Health, psychiatric disorders	Lacking, Inconclusive	Some evidence of symptoms, but not of severe clinical disorders
Sleep - long term effects	Lacking, Inconclusive	Complex mechanisms underlying long-term effects, many factors
Hearing impairment	NONE at environmental noise levels < 75 dBA	

Exposure – response relationships

examples ..... Issues

* ANNOYANCE
* CARDIOVASCULAR EFFECTS



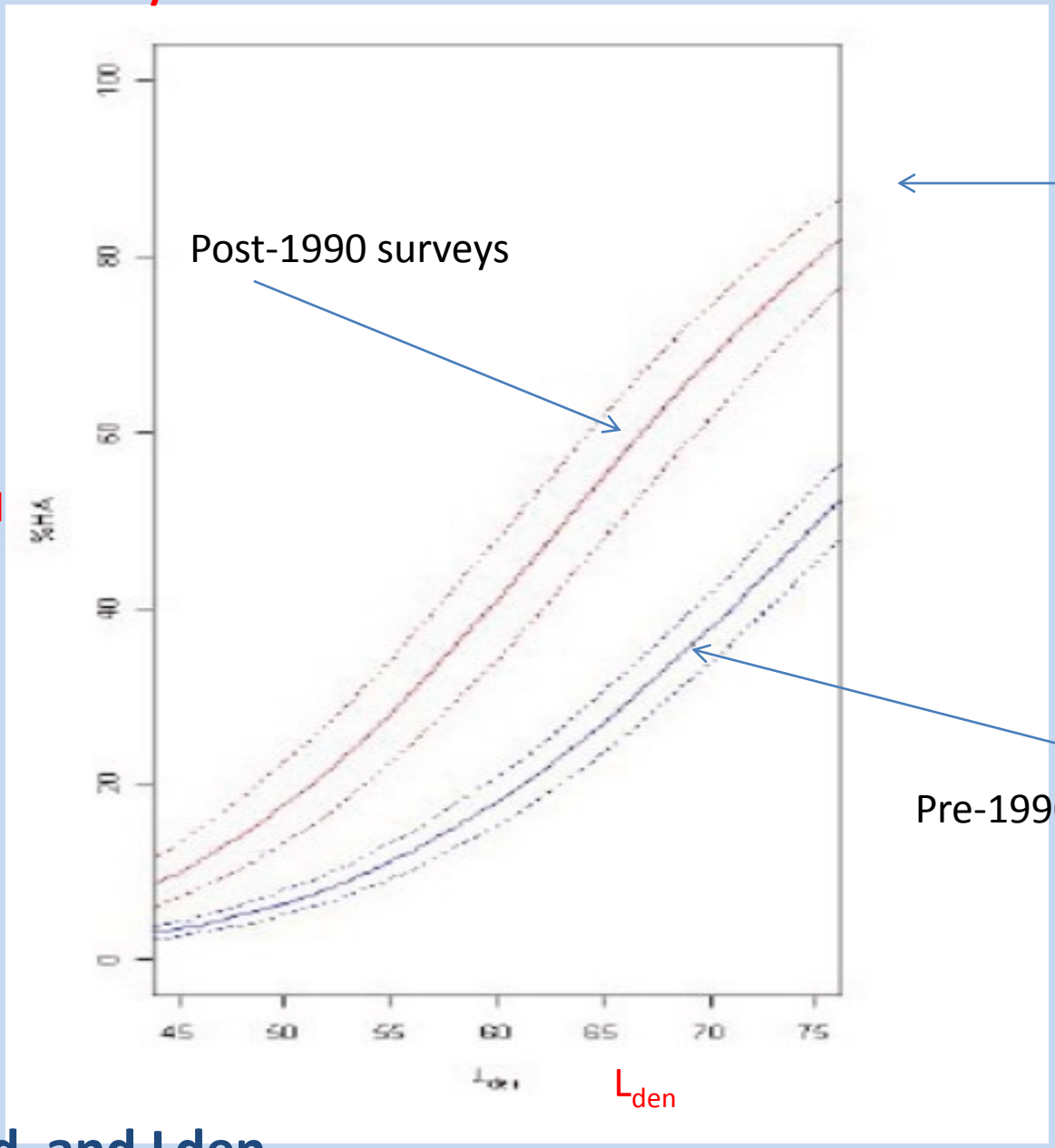
ANNOYANCE

Annoyance - *"any feeling of resentment, displeasure, discomfort and irritation occurring when a noise intrudes into someone's thoughts and moods or interferes with activity*".
NPL Report CMAM 16 1998

"Annoyance is an emotional state connected to feelings of discomfort, anger, depression and helplessness "
EEA Good Practice Guide 2010

Measured by Social Survey questions and Category Rating scales

EEA 2010 . *Good practice guide on noise exposure and potential health effects.*
EEA Technical Report 11/2010



%Highly Annoyed and Lden