

Planning for the Health of Wales
One Day Conference
Thursday 28 October 2010



Noise, Health, Planning and Policy

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OUTLINE

- **Noise and Health impact– concepts**
- **Research project for Defra.**
**Estimating Dose-Response Relationships
Between Noise Exposure And Human Health
Impacts In The UK**
- **Latest UK position**

Noise and Health – concepts



**World Health
Organization**

WHO definition of Health

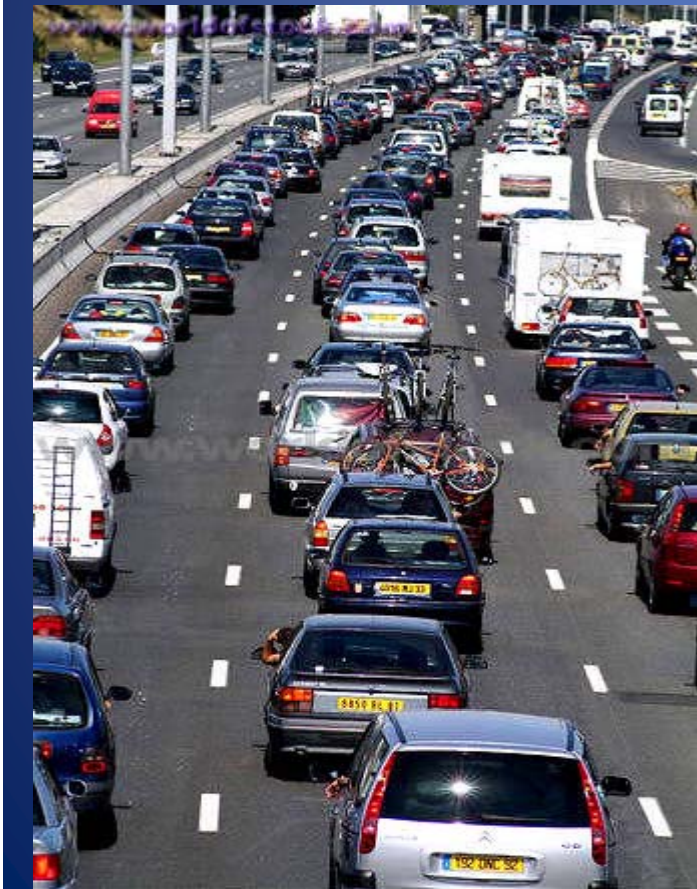
Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

What is Health ??



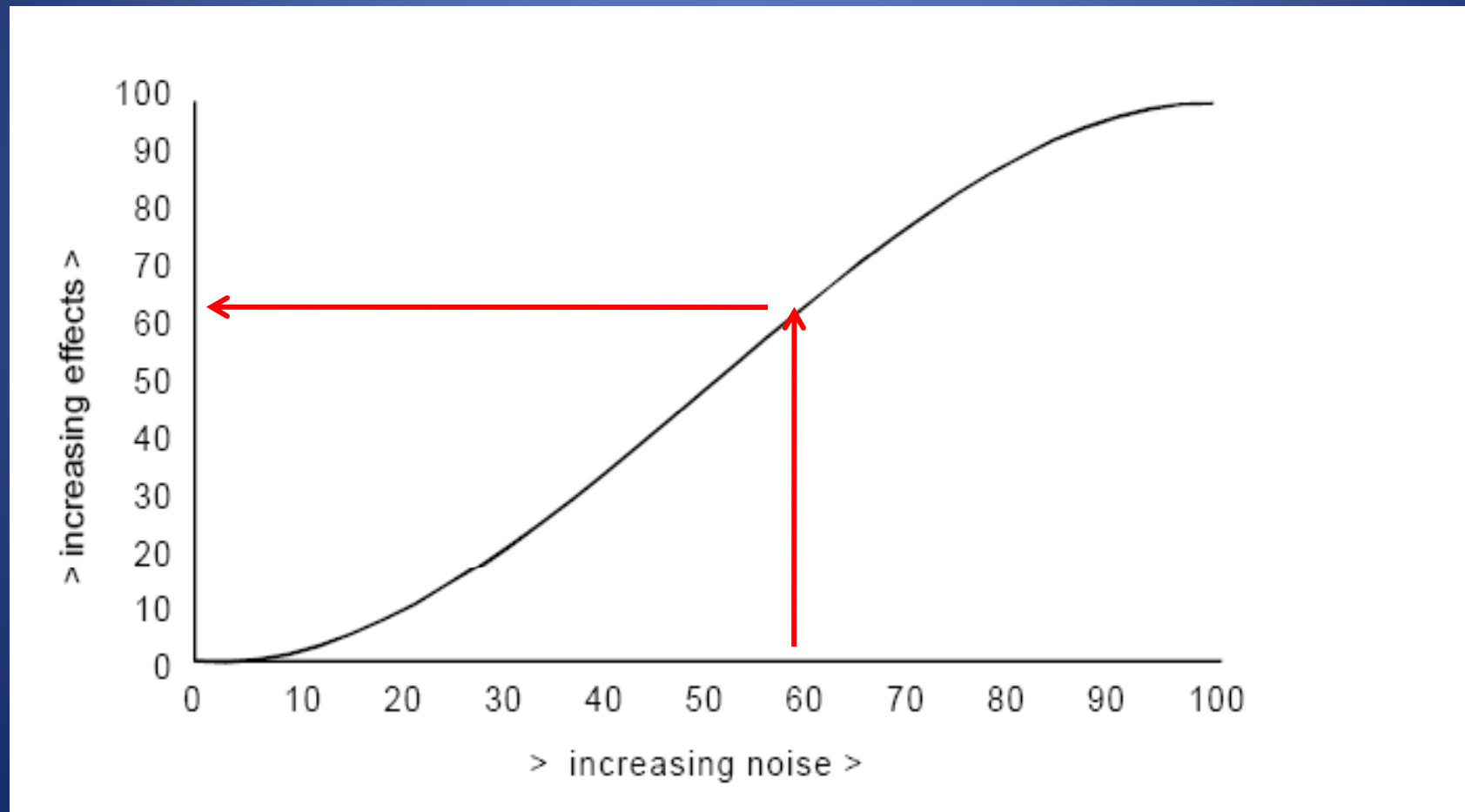


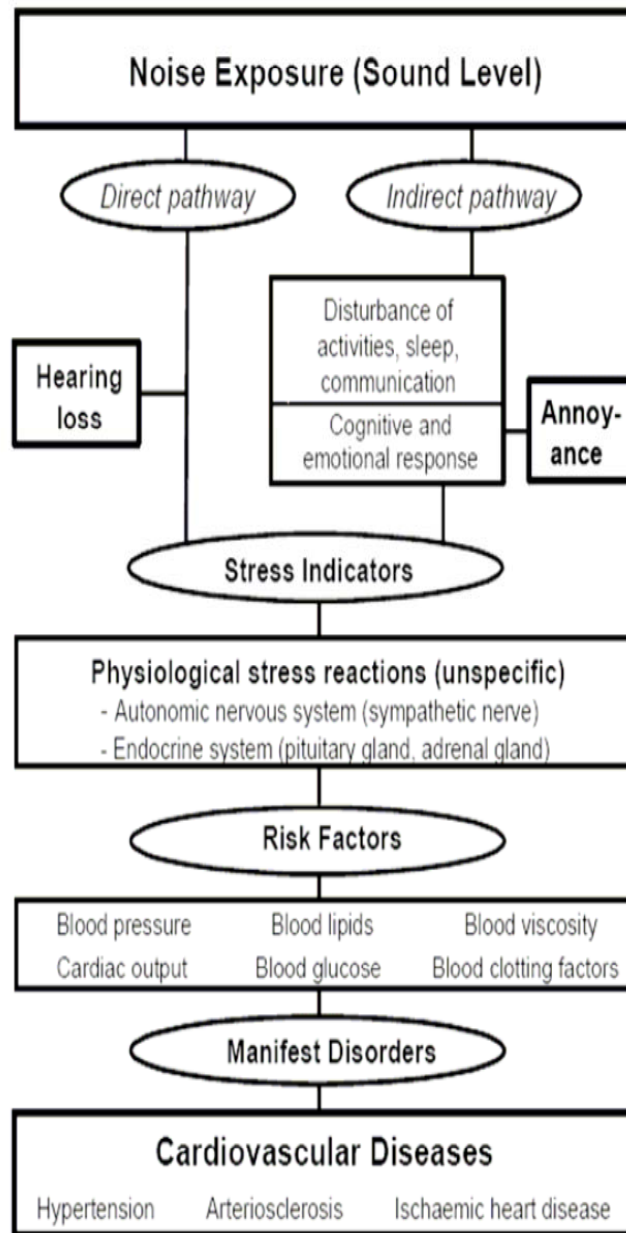
Healthy ???

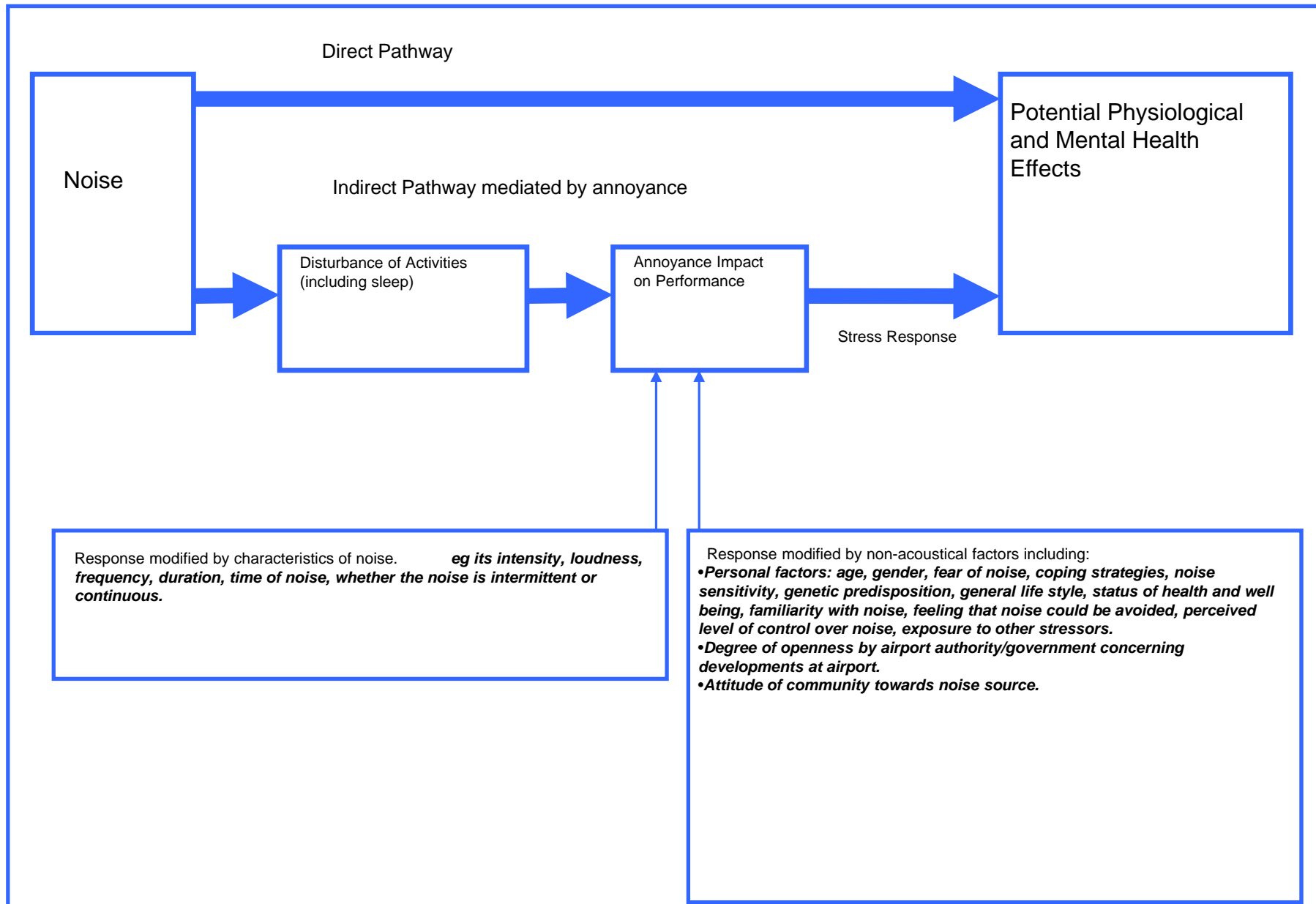


General aim of research on Noise and Health

Relate Exposure...to Effect...guide Policy







Background

Research project – review.

**“Estimating Dose-Response Relationships between
Noise Exposure and Human Health in the UK
funded by UK Department for Environment, Food and
Rural Affairs DEFRA**

**Interdepartmental Group on Costs & Benefits IGCB
Noise Subject Group IGCB(N)**

Timescale ..AUGUST 2008 to JULY 2009

FINAL REPORTS – published July 2009

- “Estimating Dose-Response Relationships between Noise Exposure and Human Health in the UK”
- Executive Summary 3 pages
- Project Report 20 pages
- Technical Report - Full Report 170 pages
-
- <http://www.defra.gov.uk/environment/quality/noise/igcb/publications/healthreport.htm>

PURPOSE OF PROJECT –

provide basis for updated IGCB[N] Methodology

Economic Valuation of Health Impact

£ £ £ £ £ £ £ £ £ £ £ £ £ £..???



EXISTING APPROACHES TO VALUATION IN UK NOISE POLICY

DfT Transport Analysis Guidance – WebTAG

Annoyance Response Relationships for Road and Rail Traffic Noise

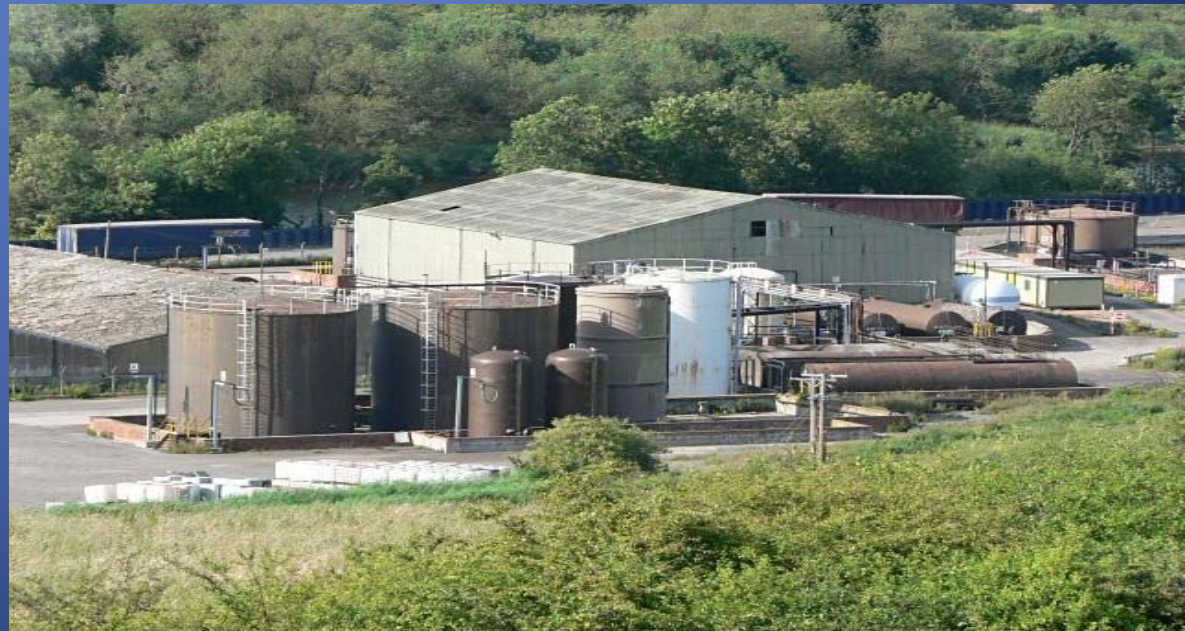
$L_{Aeq, 18hr}$ dB and % annoyed

Monetary valuation of changes in noise level
(per household, 2002 prices)

Policy Appraisal – TRANSPORT, INDUSTRY



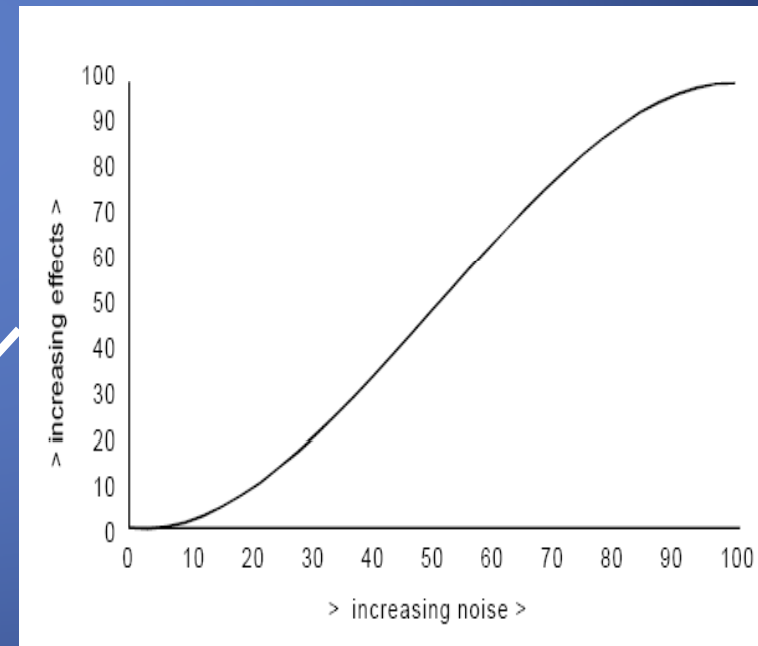
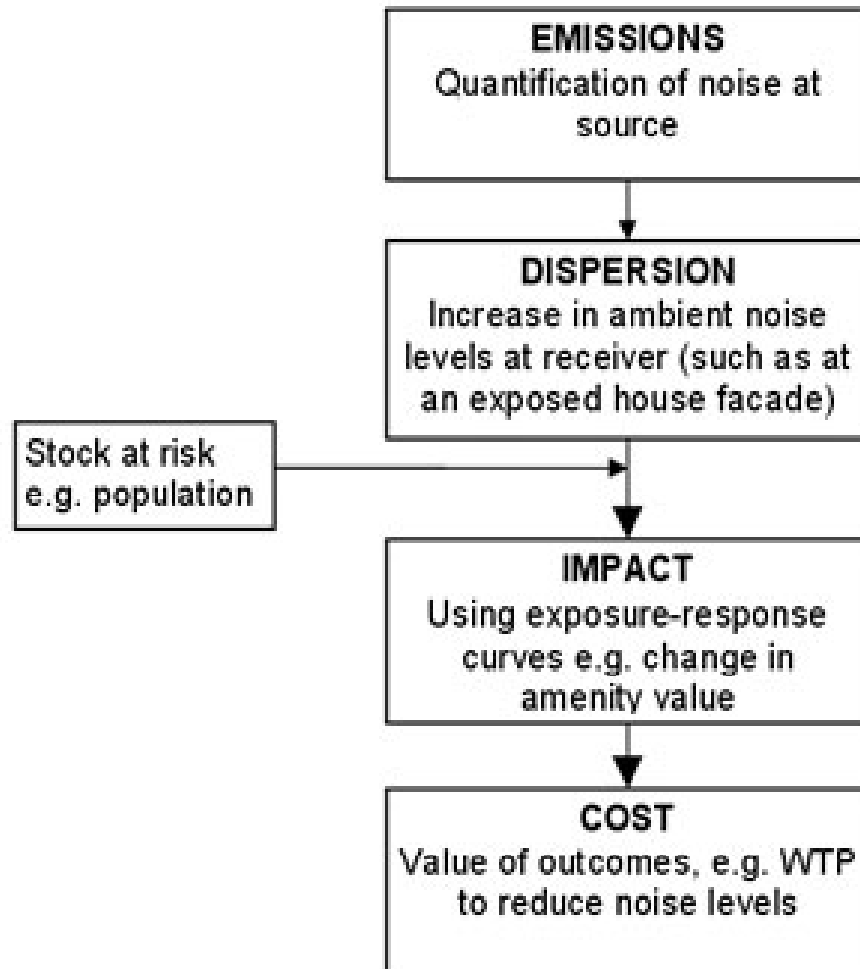
The Proposed High-Speed Link



Interdepartmental Group on Costs & Benefits

IMPACT PATHWAY APPROACH

Figure 1: Impact-pathway approach.



PROJECT AIMS

Identify the potential adverse health impacts and review the current state of evidence for each of the impacts.

Where a robust evidence base exists, to develop robust dose-response functions for the impacts of noise and health which could be applied to policy appraisal in the UK

AIMS

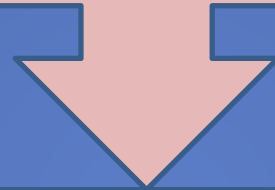
Identify emerging adverse health impacts that should be kept under review; and

Identify any structural challenges to developing a robust dose-response function

PROJECT DESIGN

PHASE 1

GENERAL REVIEW – ALL HEALTH EFFECTS

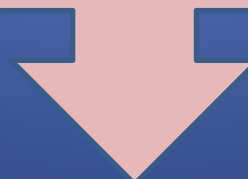


SPECIFIC CRITERIA - RELEVANT TO ECONOMIC VALUATION



PHASE 2

Focused analysis - 2 key health outcomes
Cardiovascular effects, sleep disturbance



Phase 2 Phase 1 review

Annoyance

Mental health

Cardiovascular – IHD, Acute myocardial AMI

Awakenings/sleep

Self-rated sleep disturbance

Cognitive Performance by School Children

Hearing Impairment/tinnitus

HIGH LEVEL RESULTS

CARDIOVASCULAR

Babisch in Germany and **van Kempen et al** in The Netherlands ...provide **the most robust assessments to date of the increased prevalence of acute myocardial infarction and other cardiovascular effects** in populations resident in areas with higher environmental noise sound levels

Exposure-effect relationship. Myocardial Infarction – Lday [16-hour].
Wolfgang Babisch UBA Report 2006

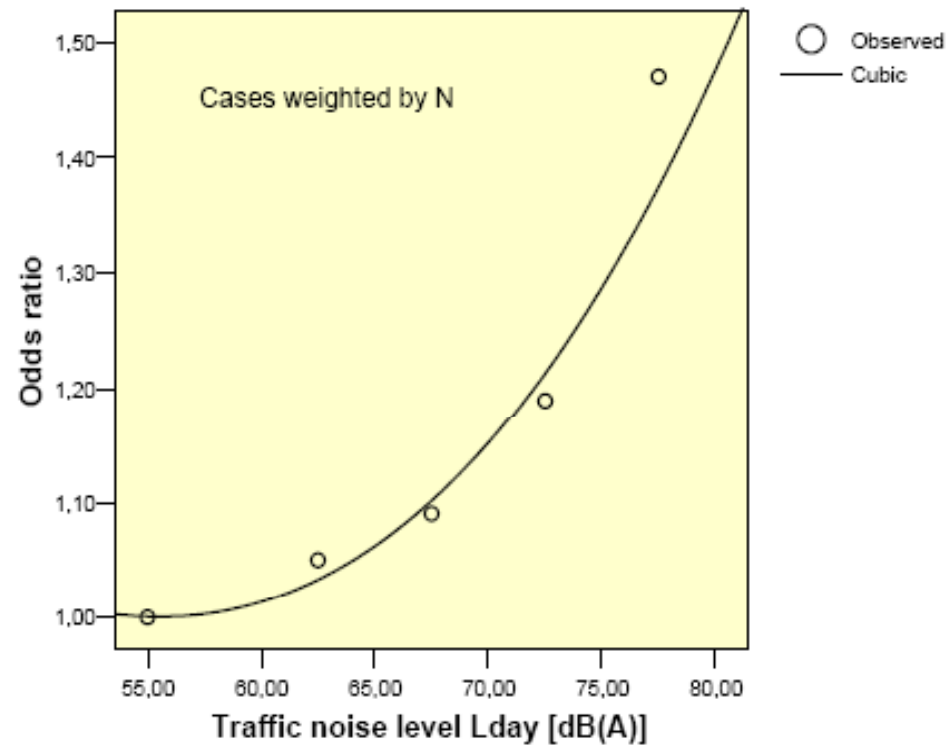


Figure 10. Polynomial curve fit (N-weighted data points) of the association between road traffic noise and incidence of myocardial infarction.

$$OR = 1.629657 - 0.000613 \cdot \text{Noise}^2 + 0.000007356734623455 \cdot \text{Noise}^3 ; R^2 = 0.96$$

(no significant linear term in the equation)

SLEEP disturbance



- Noise and **transient** sleep disturbance - well developed area with statistically robust data and dose-response relationships
- **no consensus** on any single dose-response relationship which could be used **to inform cost benefit analysis, monetary evaluation** of adverse health effects, policy etc.
- no quantitative link yet established between acute or **transient** sleep disturbance caused by noise **and any long term adverse health effects.**

POSSIBLE METHODOLOGY FOR ECONOMIC VALUATION

Based on Babisch 2006 dose-response function for AMI and Lday

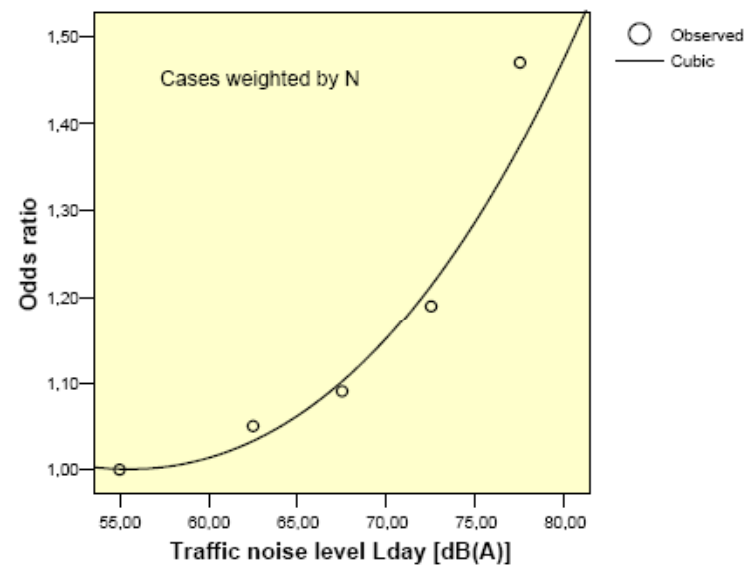


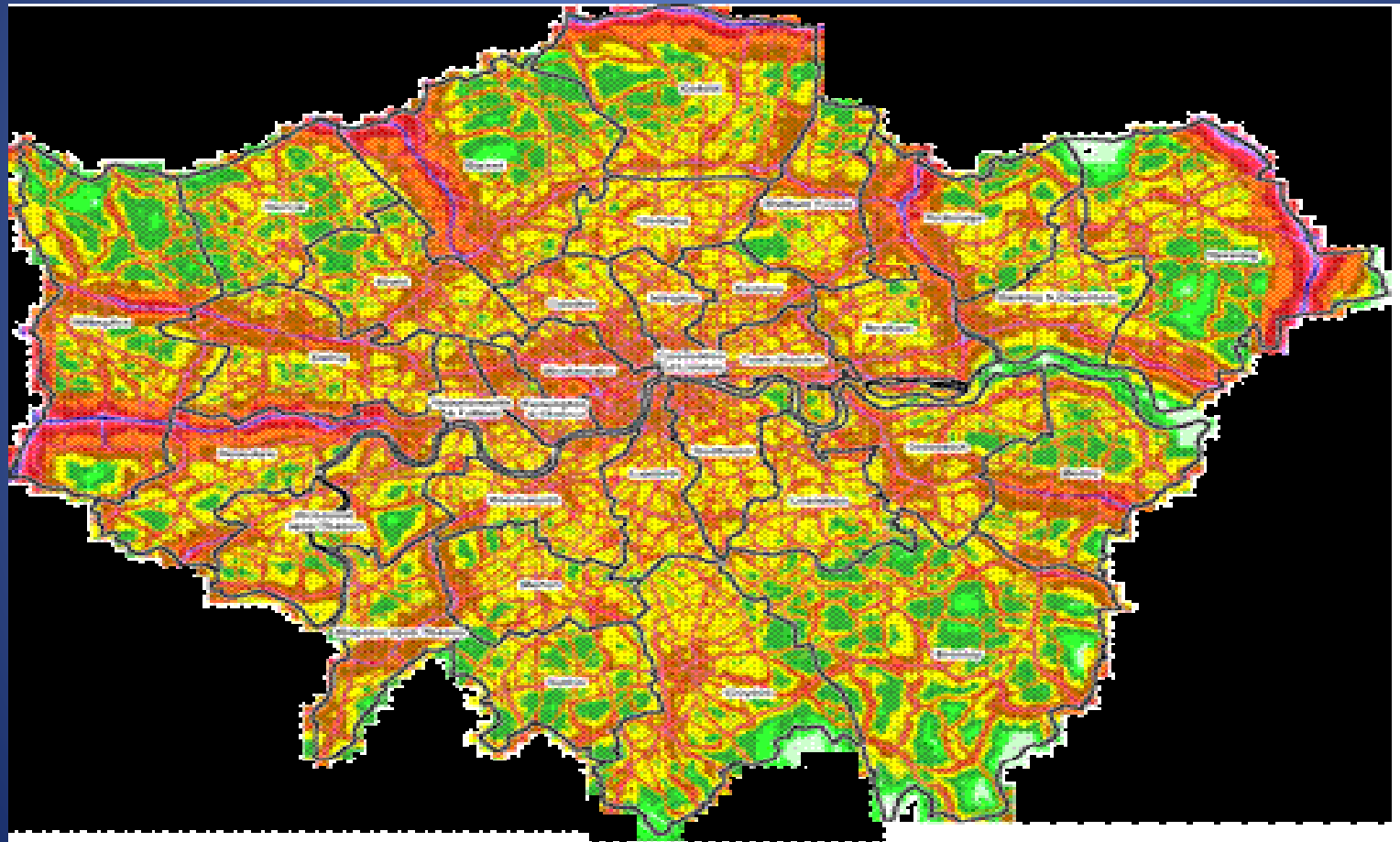
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Example – Greater London

Population 8 million



Hypothetical Noise Action Plan

ZERO population exposed above

L_{day} 70dBA, road traffic noise



	NO Action plan	Action plan... And ACTION
Traffic Noise-related AMI CASES. total	108	72
Non-Fatal	78	52
Fatal	30	20
DALYs	90	60
Population 8 million		

Effect of Action Plan.... And Action

Reduction [annual basis] of 30 DALYs

x 78,500 euros per life year =

2.355 million euro – annual basis

**** Possibly 10 times - based on life expectancy**

LATEST DEFRA POLICY POSITION

- Based on BEL review, the IGCB(N) recommends the following to reflect health impacts of noise in policy appraisal:
- The use of the IGCB(N) methodology to value acute myocardial infarction (heart attack) impacts of noise monetarily
- The continued use of the Department for Transport's WebTAG monetary values to reflect the amenity (annoyance) impacts of noise
- The use of the IGCB(N)'s values to reflect the increased risk of hypertension (high blood pressure) impacts with rising noise levels
- The use of the IGCB(N)'s values to reflect the increased risk of sleep disturbance with rising noise levels

NEW DEFRA PROJECTS OUT TO TENDER

- Estimating the **productivity** impacts of noise
- The economic value of **quiet areas**
- Quantifying the links between health effects and environmental noise related **hypertension**
- January 2011 – March 2011

Conclusions

- Basics of Noise and Health outlined
- DEFRA 2009 review project outlined
- **Cardiovascular effects** – valuation methodology for impact of acute myocardial infarction AMI
- Non-monetised impact of **hypertension and sleep disturbance**
- New linked DEFRA projects in 2011

- **THANK YOU - DIOLCH**

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