

# Transport and the Quality of Life

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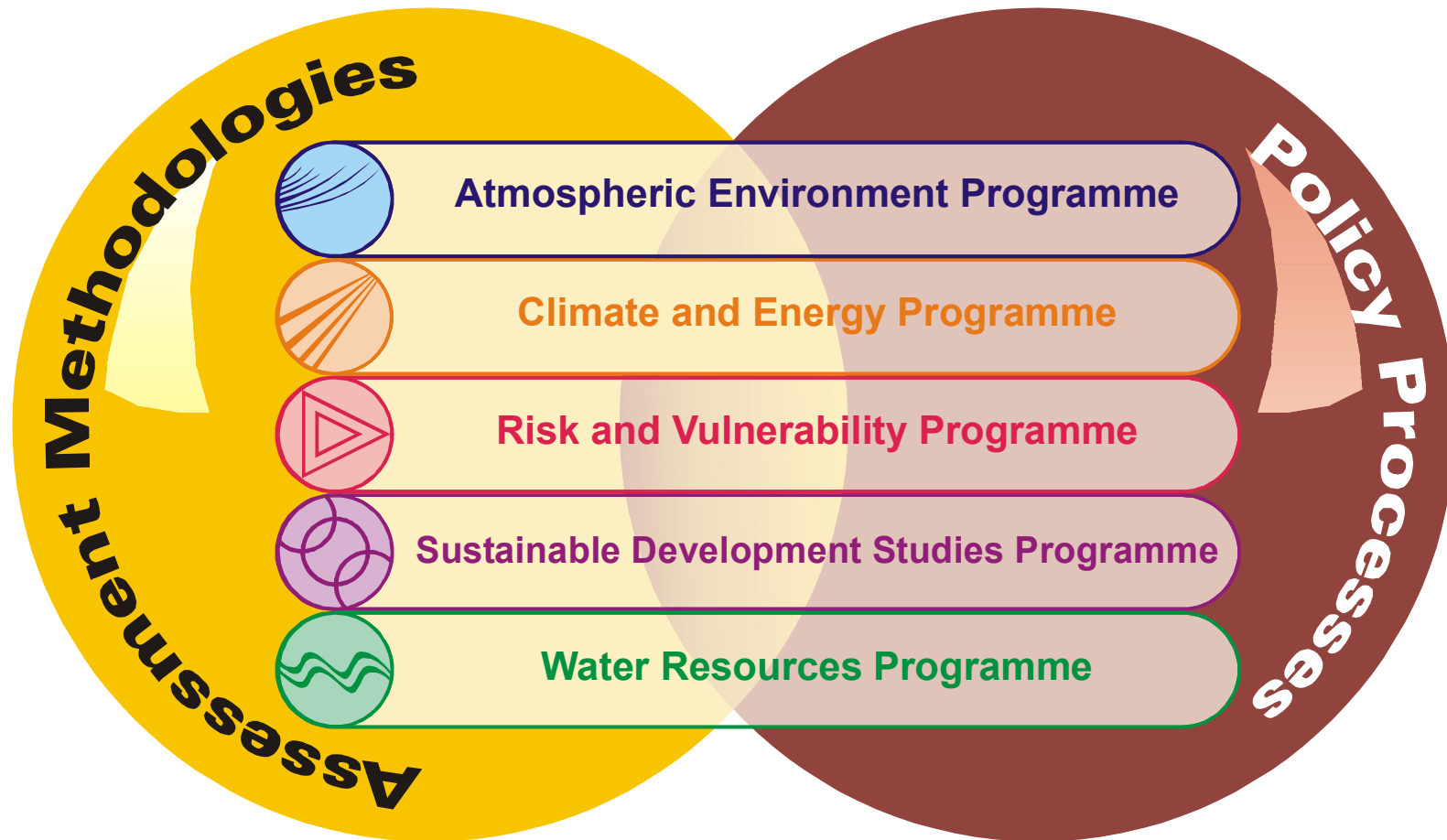
# The Stockholm Environment Institute (SEI)

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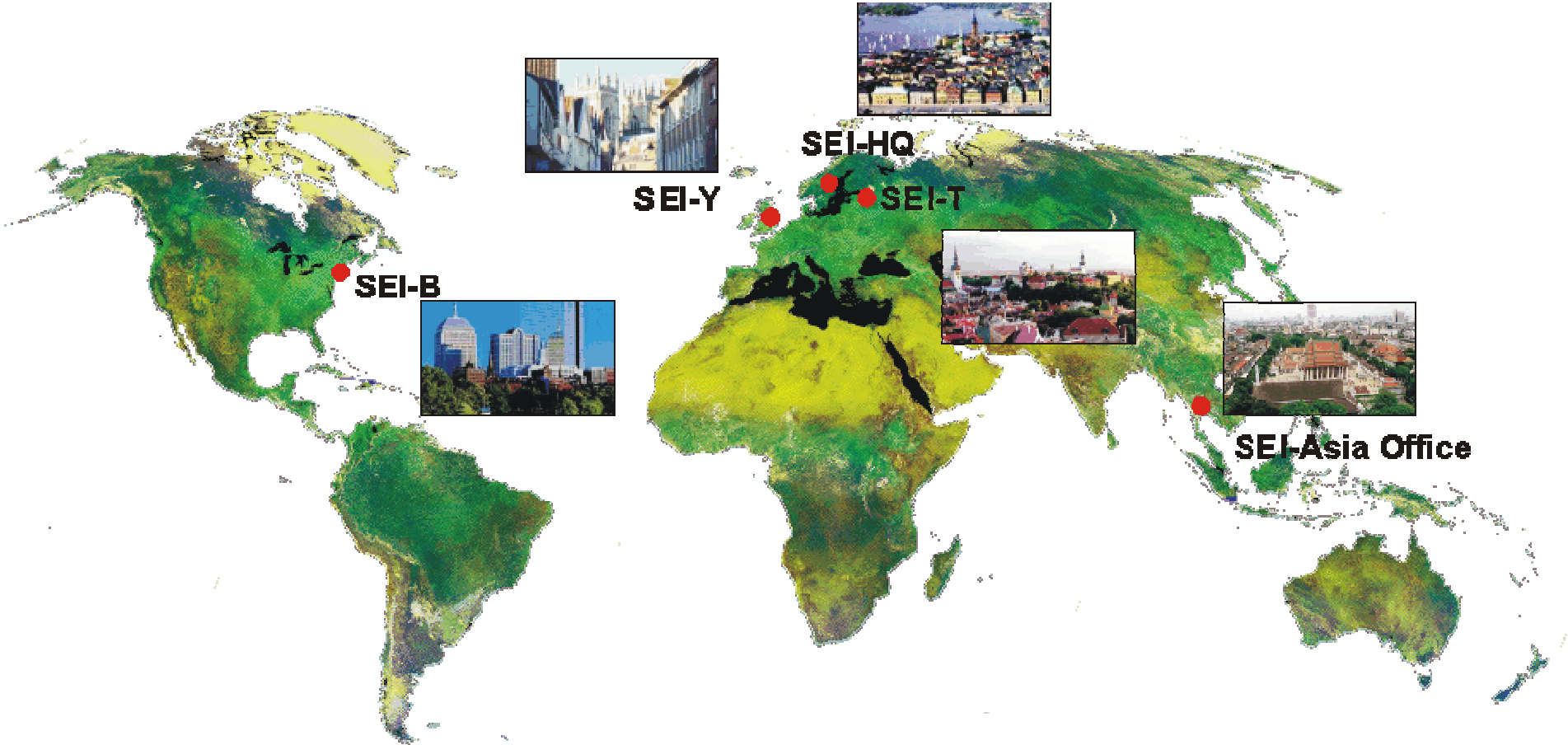


## ***Mission***

*SEI's mission is to support decision-making and induce change towards sustainable development around the world by providing integrative knowledge that bridges science and policy in the field of environment and development.*



# The SEI Centres



# Transport Focus

- York Intelligent Travel (16% decline in car use)
- Vision Zero
- Low carbon transport study for Y&H RA
- Air Quality in UK cities
- APMA

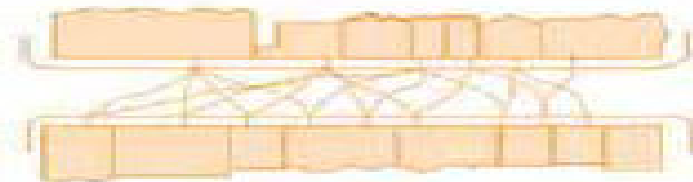
# Quality of Life

- Communities and Neighbourhoods (Donald Appleyard)
- Road safety
- Links with strong economy and inward investment (Basle)
- Air quality, noise and health
- Obesity/active travel

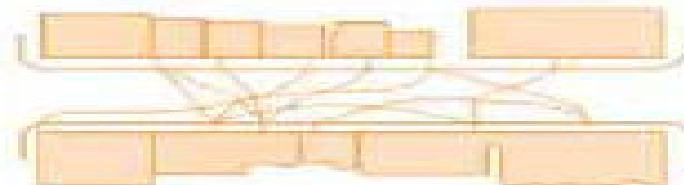
## Traffic flow affects social interaction



Light motorised Traffic  
3.0 friends per person  
6.3 acquaintances



Moderate motorised Traffic  
1.3 friends per person  
4.1 acquaintances

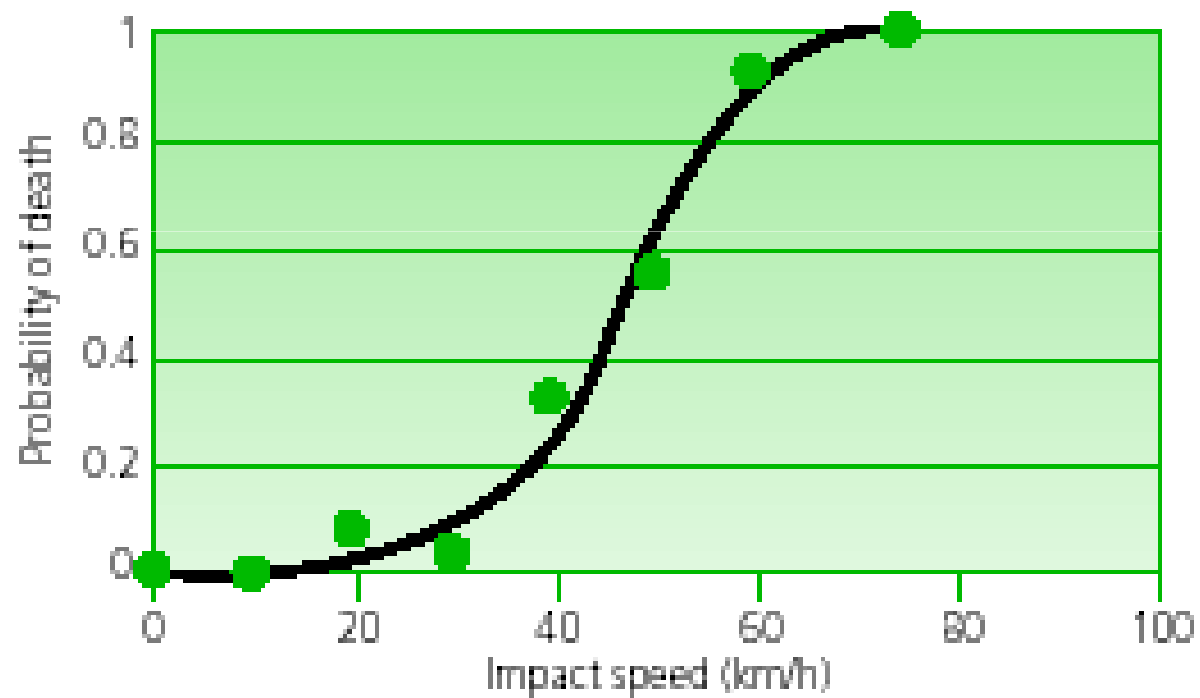


Heavy motorised Traffic  
0.9 friends per person  
3.1 acquaintances

----- Social interaction

FIGURE 3.3

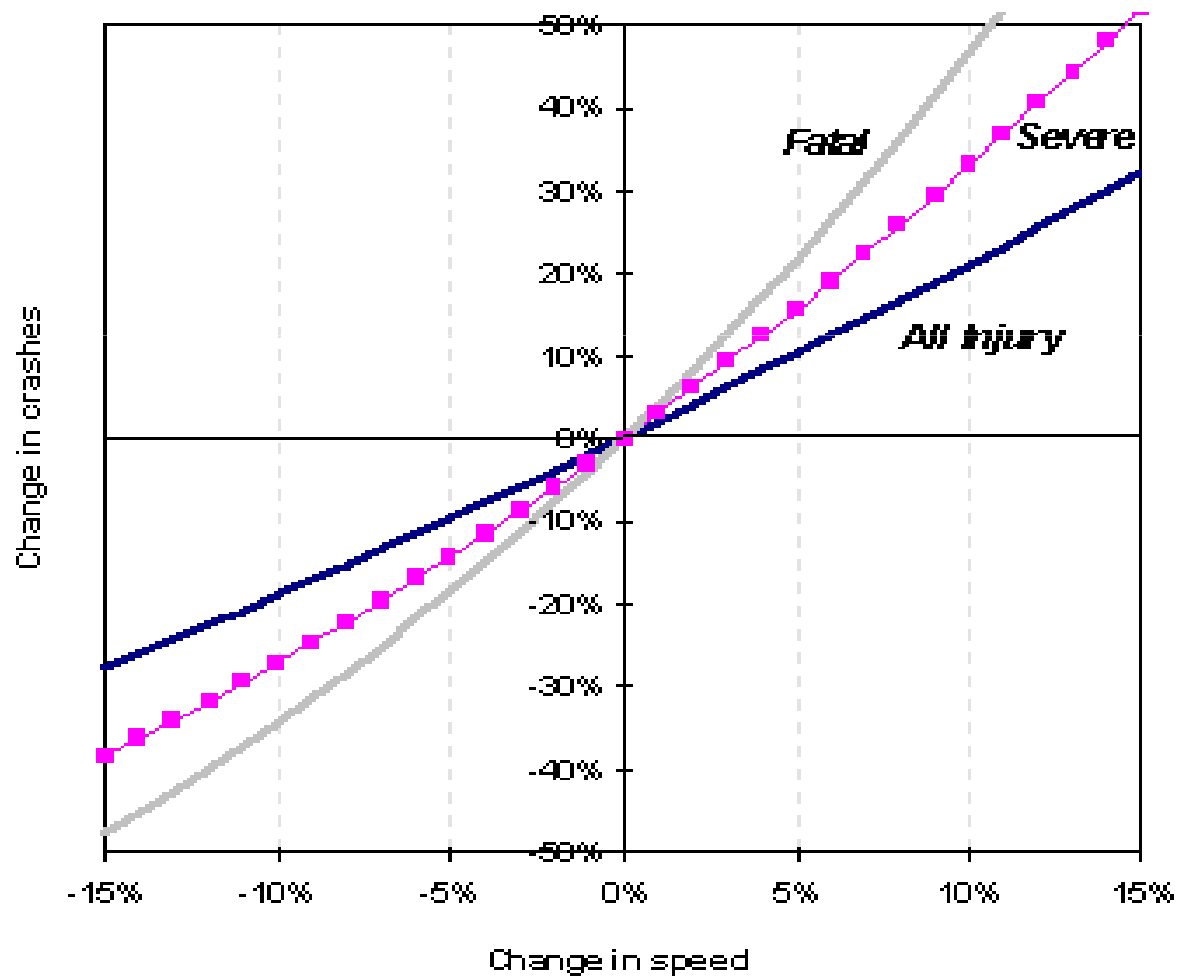
Pedestrian fatality risk as a function of the impact speed of a car



Source: reproduced from reference 49, with the permission of the publisher.

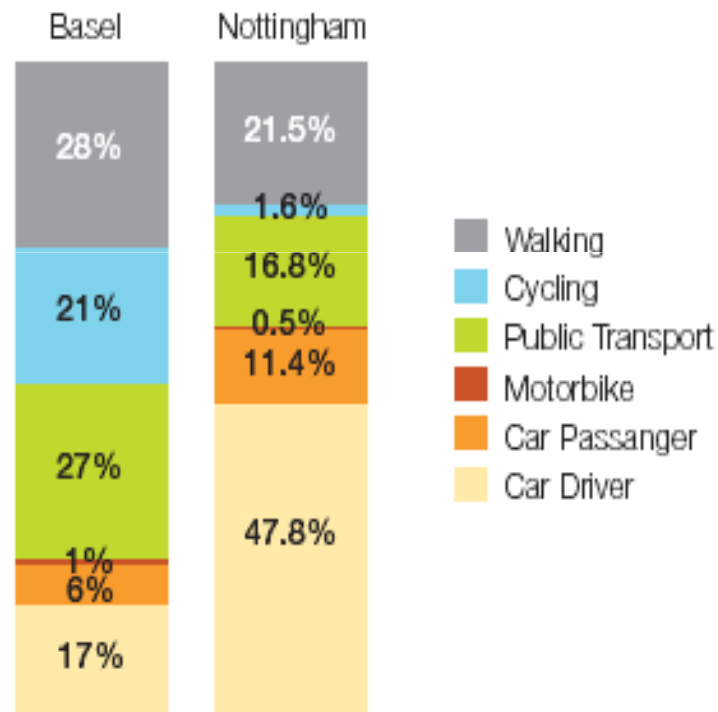


- Pedestrians have a 90% chance of surviving car crashes at 30km/h or below, but less than a 50% chance of surviving impacts at 45 km/h or above (50).
- The probability of a pedestrian being killed rises by a factor of 8 as the impact speed of the car increases from 30 km/h to 50 km/h (51).



## Mode travel choice in Basel, Switzerland and Nottingham, UK

% trips per person (Socialdata)



## **Premature deaths due to particulate matter**

Germany 65,088

Italy 39,436

France 36,868

UK 32,652

Poland 27,934

Spain 13,939

Netherlands 13,123

Hungary 11,067

Belgium 10,669

Czech Republic 7,996

Austria 4,634

# Air pollution and health

- How many die and/or hospitalised in York as a result of air pollution
- Greater impact on children and the elderly
- Links with cardiovascular disease
- Growth in traffic large enough to cancel out gains from technology

**Table 1.1**

**Maximum average of pollutant concentrations breathed in by cyclists and motorists in one hour on the same journey at the same time**

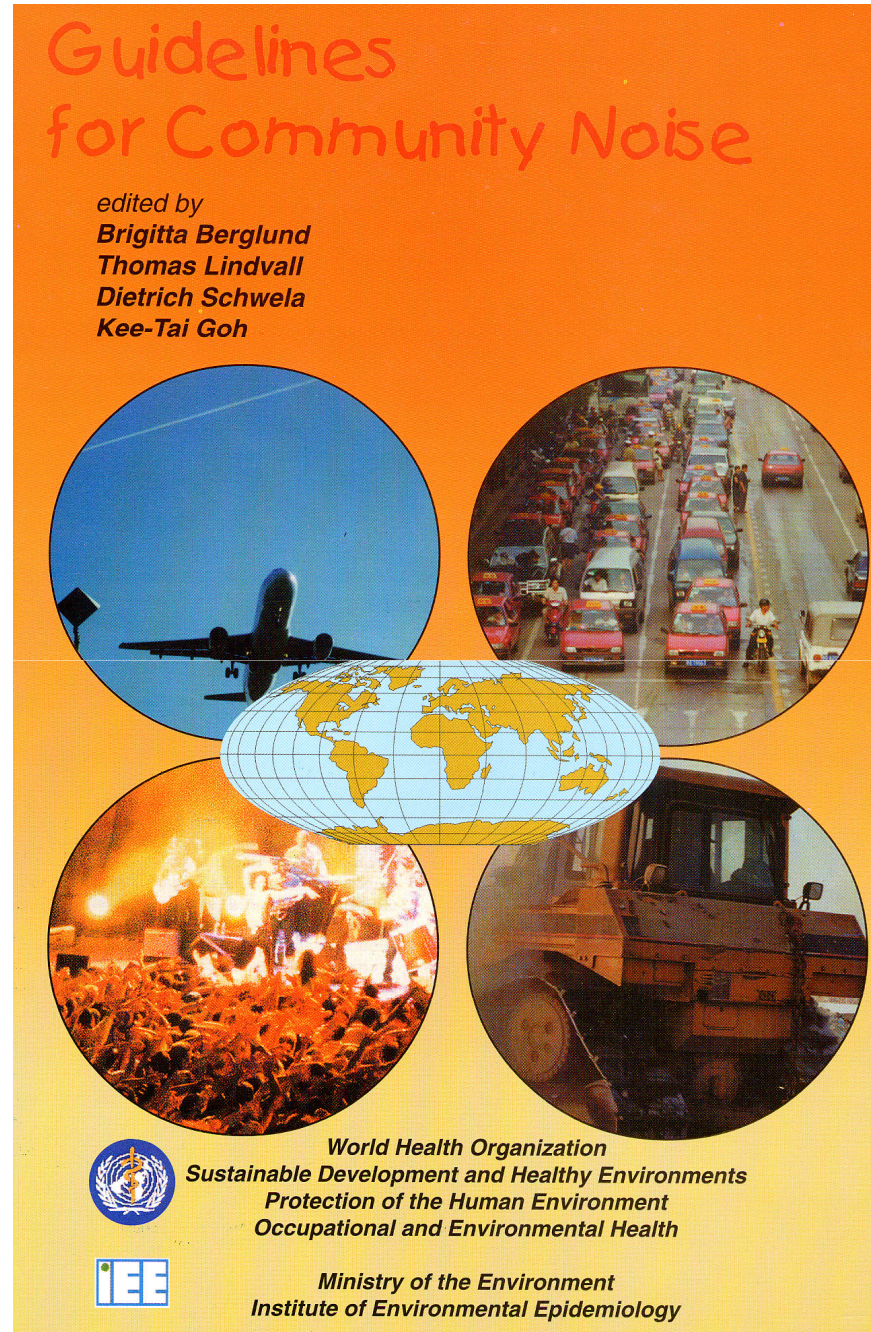
	Cyclists ( $\mu\text{g}/\text{m}^3$ )	Motorists ( $\mu\text{g}/\text{m}^3$ )
Carbon monoxide (CO)	2 670	6 730
Nitrogen dioxide ( $\text{NO}_2$ )	156	277
Benzene	23	138
Toluene	72	373
Xylene	46	193

*Source:* The exposure of cyclist, car drivers and pedestrians to traffic-related air-polluants, Van Wijnen/Verhoeff/Henk/Van Bruggen, 1995 (Int. Arch. Occup. Environ. Health 67; 187–193)

# WHO

## Guidelines for Community Noise

Geneva, 2000



# Direct Health Effects:

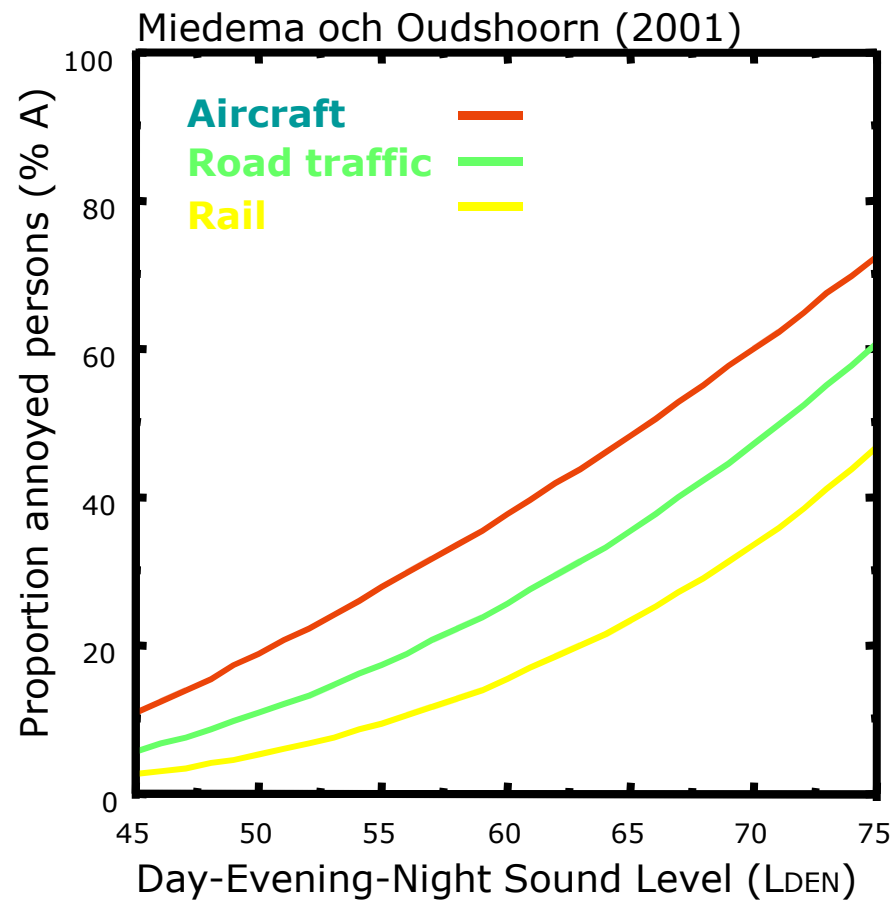
- Annoyance
  - Interference with communication
  - Sleep disturbance
  - Performance, productivity and human development
  - Social behaviour
- [Possible to measure directly on human beings]



# Effects of Noise on Performance

- Direct performance effects:
- Chronic effects on cognitive development, memory and reading in children
- Chronic effects on motivation in children

# Annoyance: % A = f (LDEN)



# Sleep

S L E E P

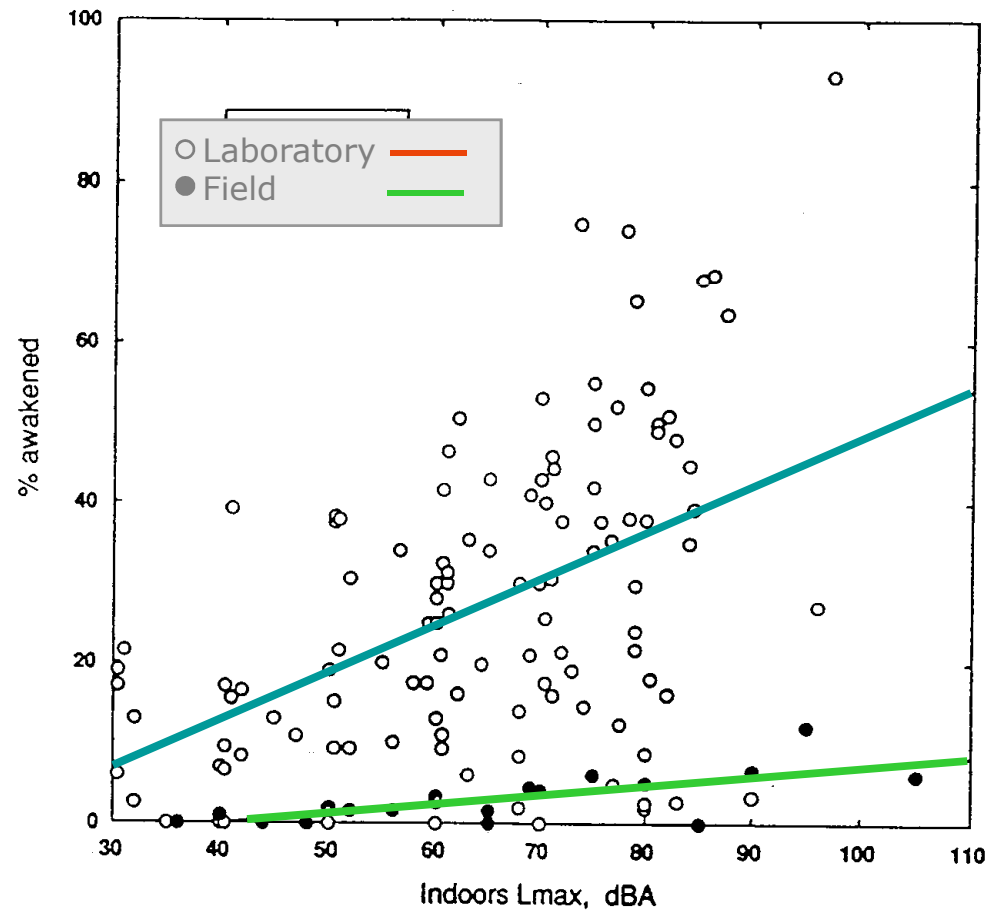
J. ALLAN HOBSON



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# Sleep Disturbance: LAB - FIELD



# Long Term Health Effects

- Hearing Impairment
- Psychophysiological Effects, mainly cardiovascular effects (ischaemic heart disease, hypertension) and stress effects
  - [Risk assessments of effects]

# **Vulnerable Groups**

- **Children and adolescents**
- **Hearing impaired persons**
- **The Elderly**
- **Shift and night-time workers**
- **Persons with diseases/in rehabilitation**

# Target 24 of Health for All Strategy

- “By the year 2000, cities, towns and rural communities through the region should offer physical and social environments supportive to the health of their inhabitants”

**[WHO European Member States, 1991]**

# WHO Guideline Values

Specific Environment	Critical Health-Effects	LAeq dB	Hours	LAmx dB fast
Outdoor living area	Moderate annoyance, day & evening	50	16	-
Schools and preschools, indoors	Speech intelligibility	35	During class	-
Dwelling inside bedrooms	Sleep disturbance, nighttime	30	8	45



# WHO Guideline Values

Specific Environment	Critical Health-Effects	LAeq dB	Time in Hours	LAmix dB fast
Industrial, commercial shopping and traffic areas, in- & outdoors	Hearing impairment	70	24	110
Music in headphones, impulse sounds from toys, fireworks and firearms	Hearing impairment in children	-	-	120
Outdoors in parkland and conservation areas	Disruption of tranquillity	Low		

**Ministerial Conference London 1999**

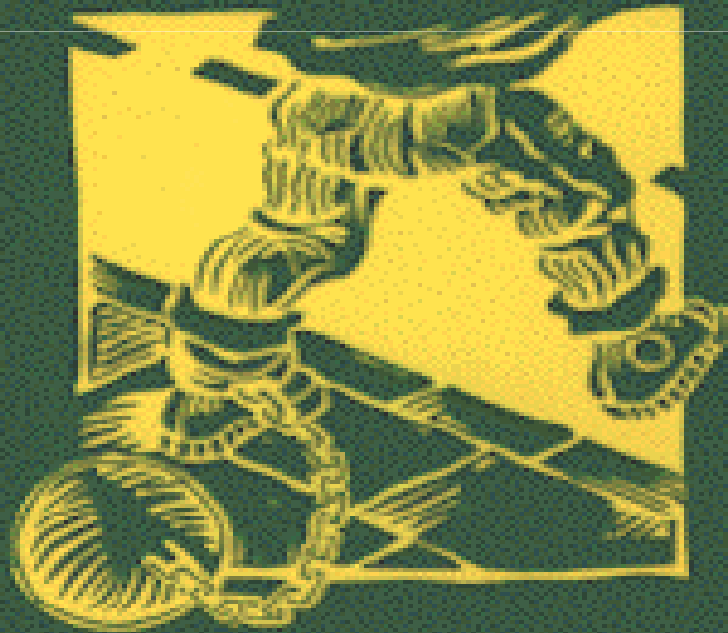
## **Annex 4, Health Targets for Transport, Environment & Health**

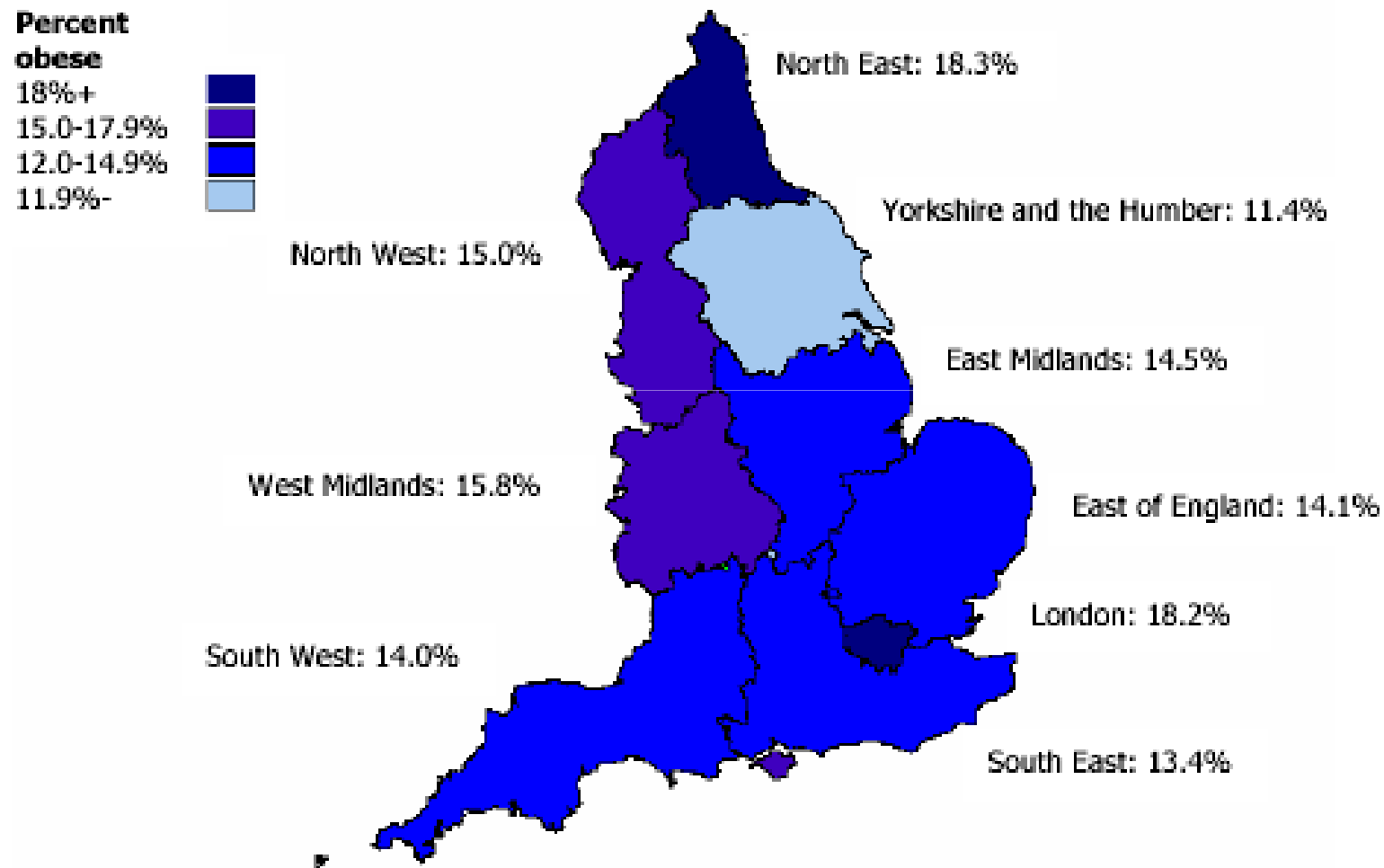
- **Reverse the noise pollution trend of increase by**
  - **noise emission measures**
  - **noise immission measures**
- **Protect existing quiet areas and promote quietness**

# *One False Move ...*

A STUDY OF CHILDREN'S  
INDEPENDENT MOBILITY

EDITED BY  
JOHN ADAMS  
JOHN WHITEHEAD

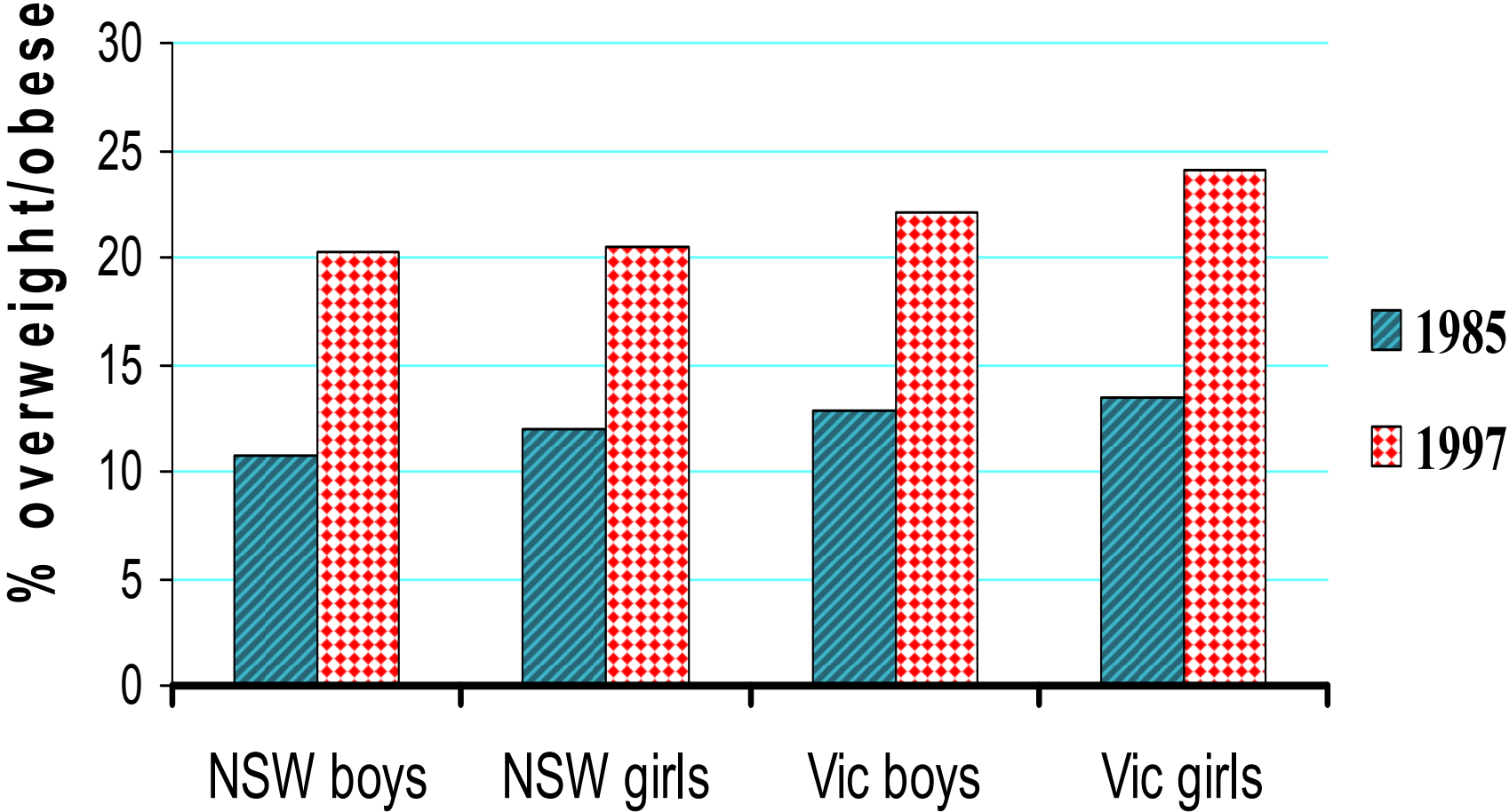




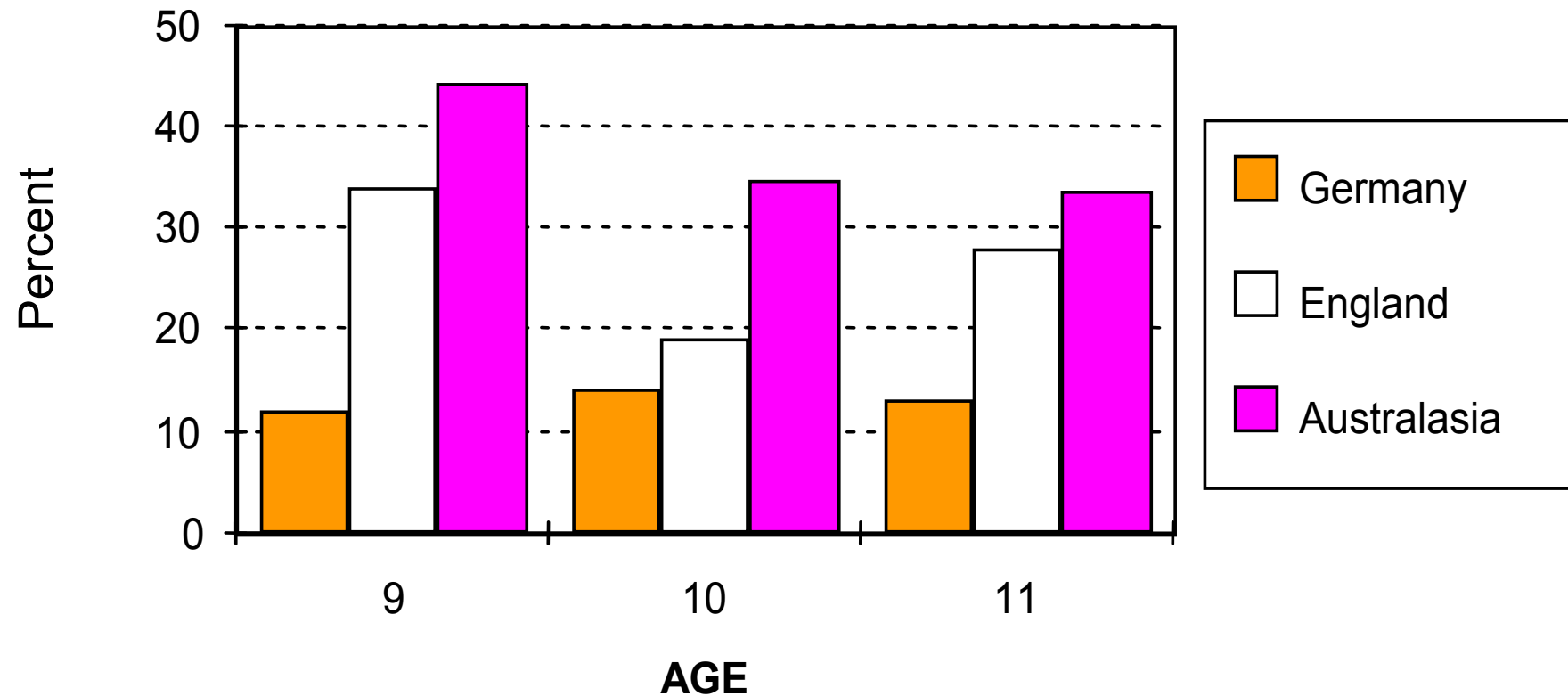
**Figure 5:** Obesity among children aged 2-10, by Government Office Region, 2001-2002

# Sharp Rise in Obesity and Overweight among Children in NSW and Victoria, 1985-1997

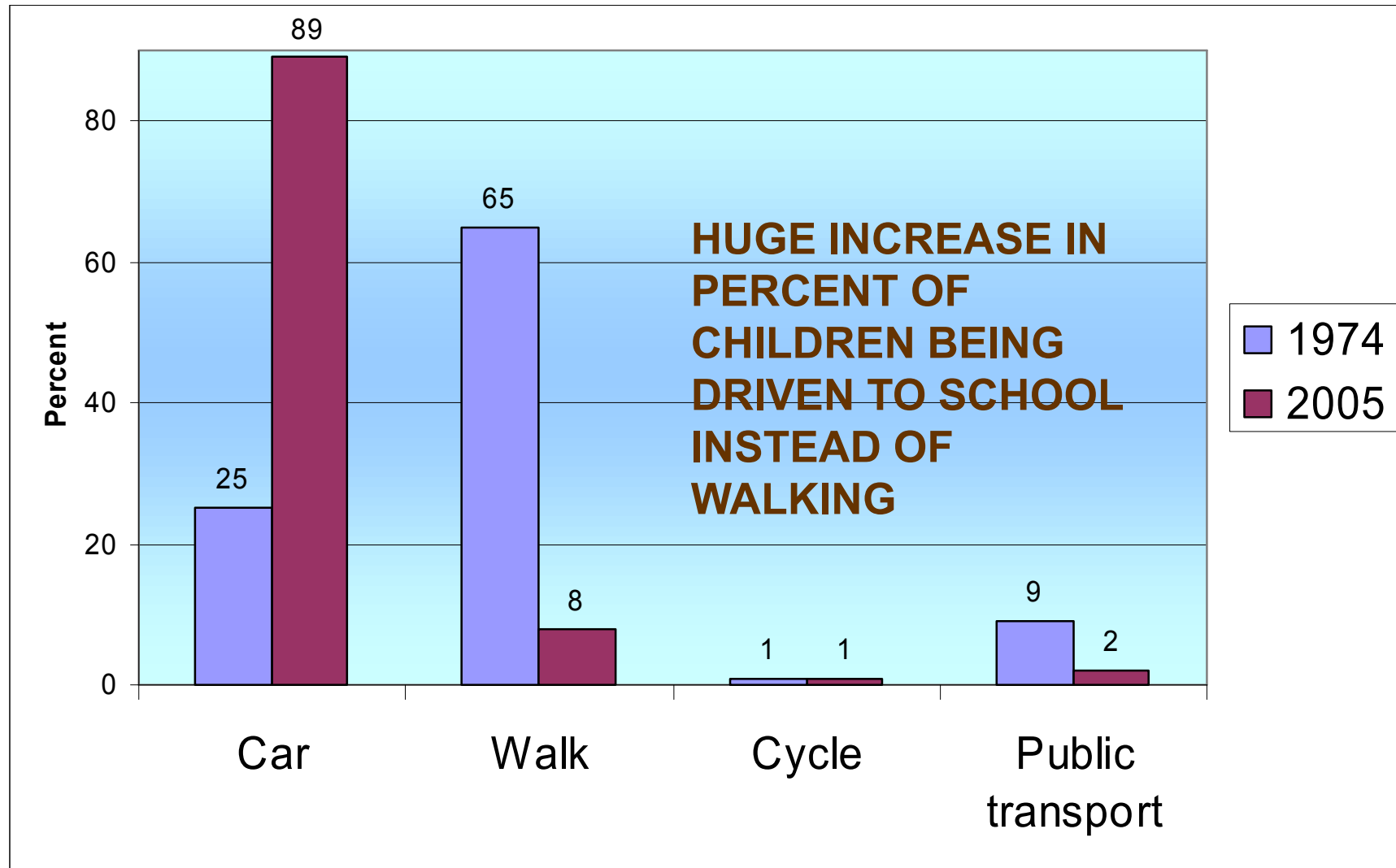
What does this bode for the future health of Australians?



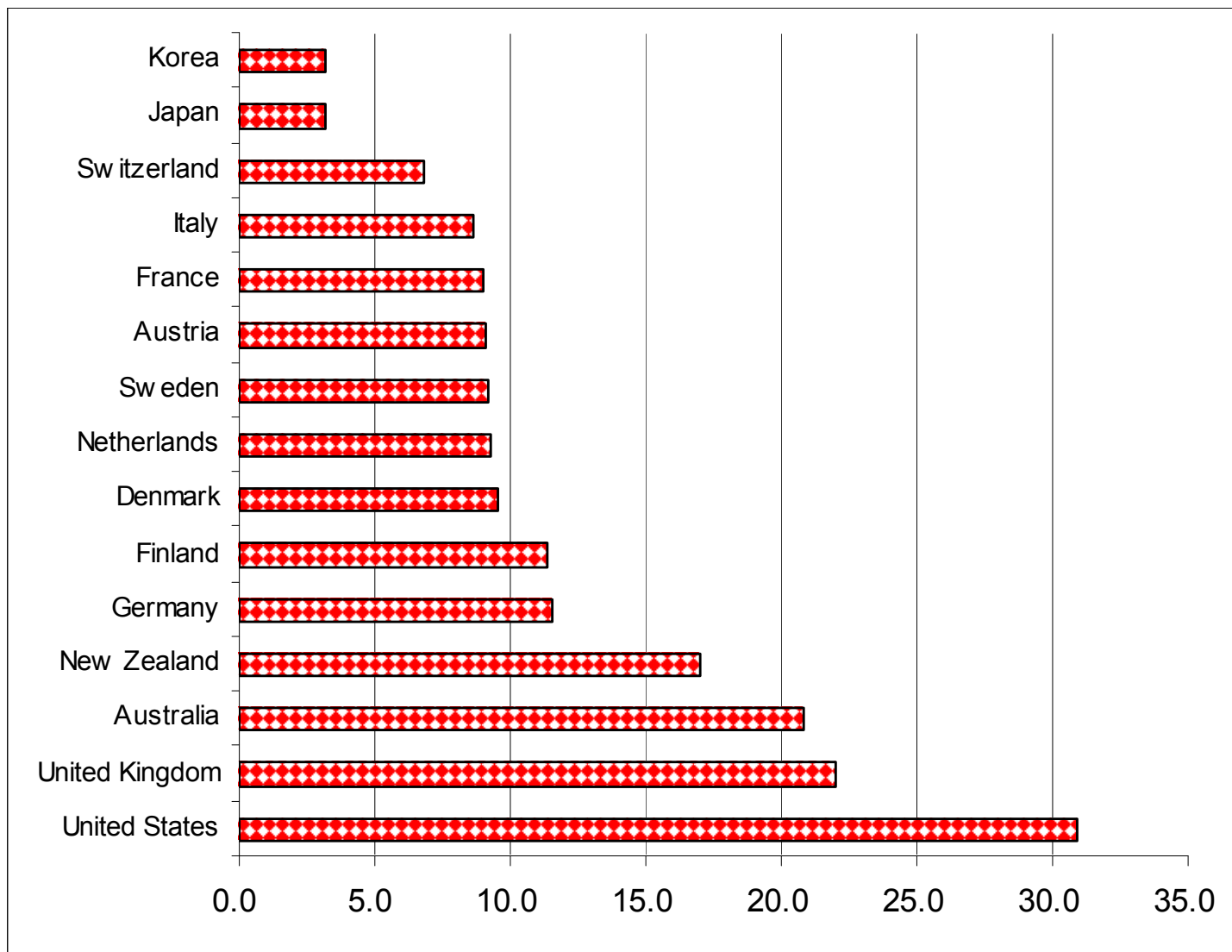
## Percent of children driven to school by car in 1990s in Germany, England and Australasia (Tranter, 1996)



## Modes of transport to primary school in Melbourne, 1974 and 2005 (Source: Peddie & Somerville, 2005)



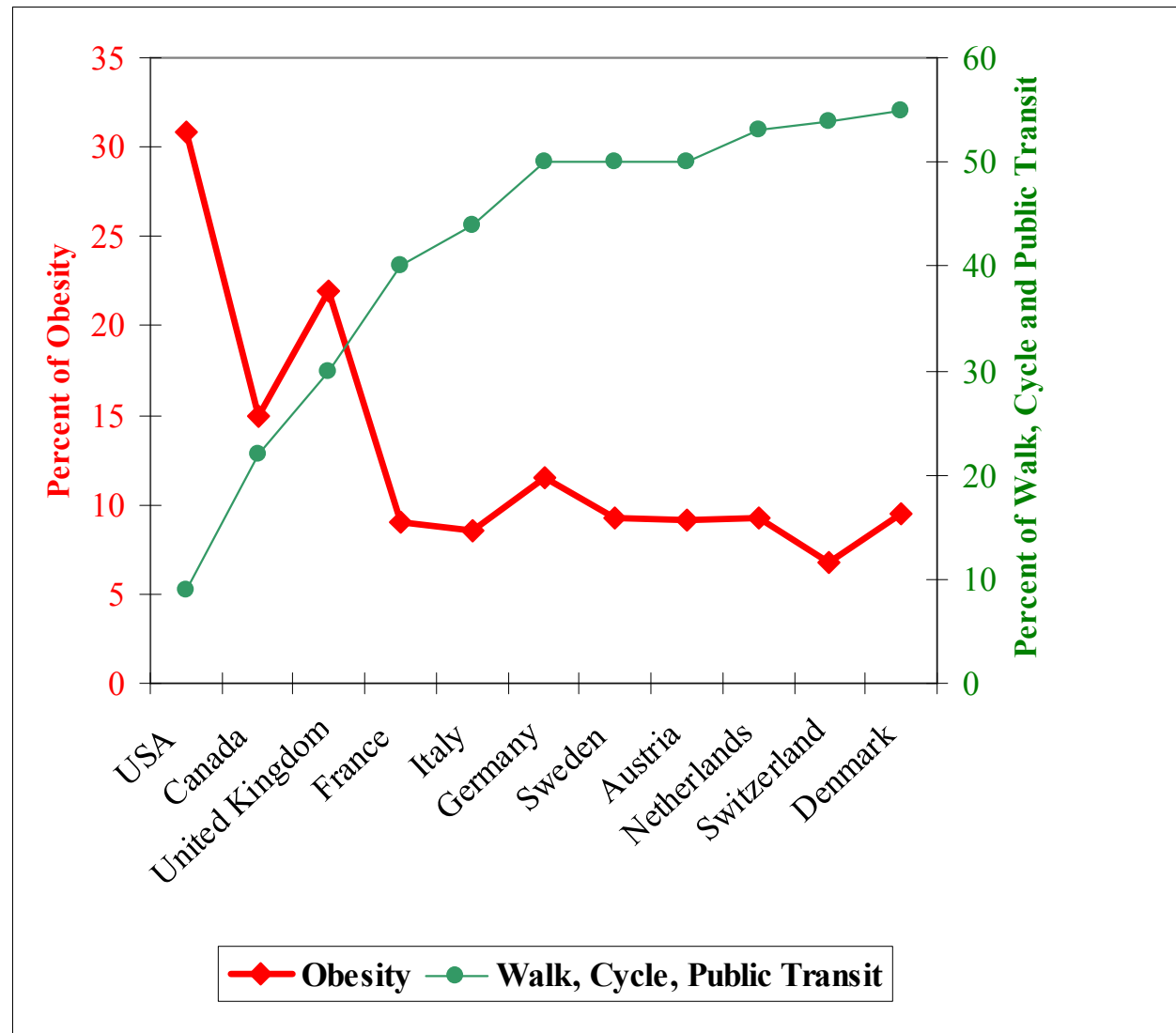
# Obesity Rate by Country



Sources: Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; World Health Organization, International Obesity Task Force; Organization for Economic Cooperation and Development, Public Health Statistics.



# Obesity falls sharply with increased walking, cycling, and transit use!



Source: Pucher and Dijkstra, "Promoting Safe Walking and Cycling to Improve Public Health, *Am Journal of Public Health*, September 2003.

***What action should they take?***

Ensure the needs of pedestrians and cyclists are given priority when developing or maintaining streets and roads. Use one or more of the following methods:

- restrict motor vehicle access (for example, by closing or narrowing roads to reduce capacity)
- re-allocate road space to cyclists and pedestrians (for example, by widening pavements and introducing cycle lanes)
- consider selective road-user charging schemes
- introduce traffic calming schemes
- create safe routes to school (for example, via traffic-calming measures near schools and by creating walking and cycle routes to schools).

# What can York do?

- Not add to road space
- General system-wide 20mph speed limit
- Reallocate highway space to people, bikes and buses
- Eliminate rat-running
- Vauban as model for new developments