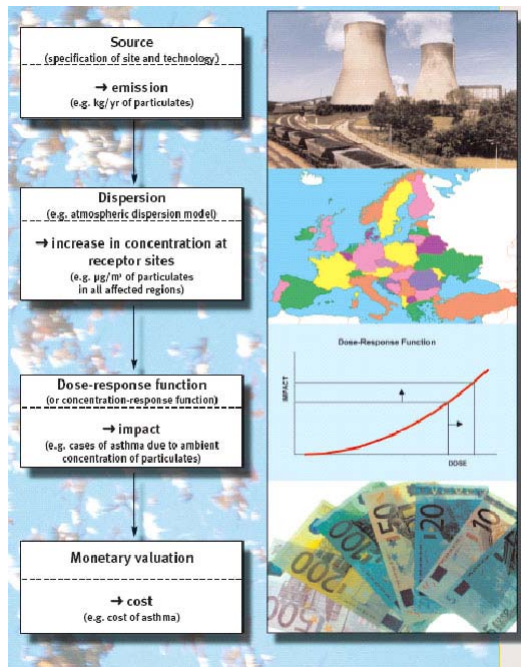


The Cost of Inaction: Human Health Impacts from Pollution

Ståle Navrud

Department of Economic and Resource Management
Norwegian University of Life Sciences (UMB)



DAMAGE FUNCTION APPROACH

Source:
Externe EU Project Series
<http://www.externe.info/externpr.pdf>

Dose-response functions	Pollutant / Burden	Effects
Mortality	PM ₁₀ , O ₃ , SO ₂ , NO _x	Reduction in life expectancy
	Benzene, Benzo-[a]-pyrene 1,3-butadiene, Diesel particles	Cancers
Morbidity	PM ₁₀ , O ₃ , SO ₂	Respiratory Hospital adm.
	PM ₁₀ , O ₃	Restricted Activity Days
	PM ₁₀ , CO	Congestive heart failure
	Benzene, Benzo-[a]-pyrene 1,3-butadiene, Diesel particles	Cancer risk (non-fatal)
	PM ₁₀ (Particulate matter < 10 μm) PM _{2.5} (Particulate matter < 2.5 μm)	Cerebro-vascular hospital adm Cases of chronic bronchitis Cases of chronic cough in children Cough in asthmatics Lower respiratory symptoms
	O ₃	Asthma Attacks Symptom Days

Relative importance of health impacts

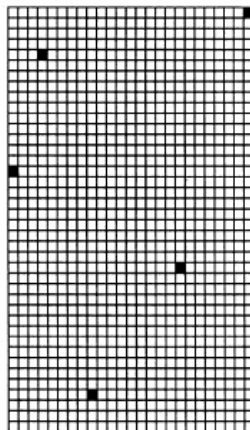
- **Cost of Inaction**
 - Welfare loss from health impacts of air pollution from electricity generation about 1 % of GDP in most EU15-countries (ExternE)
 - Health costs constitute 61-77 % of total costs of air pollution in Poland = 0.8-1.0 % of GDP
- **Benefits of Action**
 - CBA of 1990 Clean Air Act (US EPA 1999)
 - Health impacts constitute 96 % of total benefit
 - CBA of CAFE ?

Values for Premature Deaths VSL and VLY

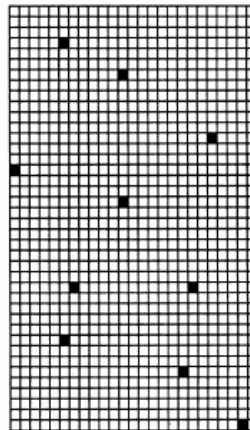
	Method	Value
US EPA	Collection of studies; mostly Hedonic Wage	\$ 6.1 million No age adjustment No cancer premium
EC DG ENV	Best estimate from UK Contingent Valuation transport	€ 1.4 million 0.7 adj. for age 70+ + 50% cancer prem.
UK DEFRA Contingent Valuation study	Contingent Valuation survey	Value of Life Year (based on 1 month) £ 27,630

Suppose there are two people:

Person 1:
Chance of death
= FIVE in 1,000
over the next ten
years.



Person 2:
Chance of death
= TEN in 1,000
over the next ten
years.



Which person is the most likely to die in the next ten years?

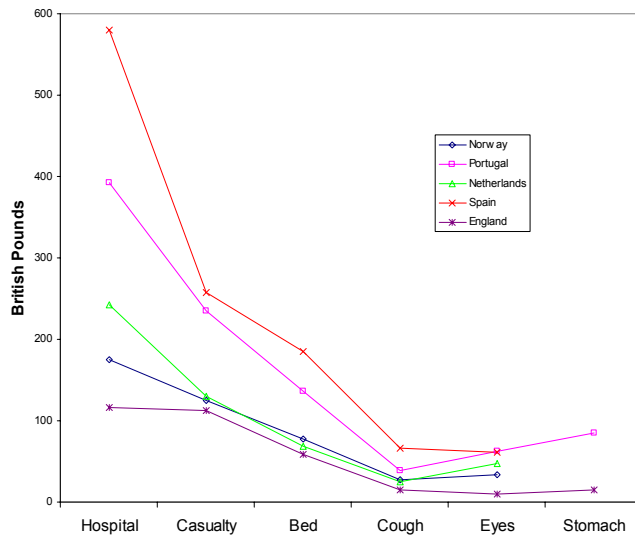
1. Person 1

2. Person 2

Press the Blue Key to Continue

Morbidity

Contingent Valuation Study in 5 countries of willingness-to-pay of a "standard respondent" to avoid episodes of respiratory illnesses from air pollution



Source:
Ready, Navrud, Day,
Dubourg, Machado,
Mourato, Spanninks,
Vázquez Rodriguez 2003

Specific Challenges

- Latency (discount rate)
- Nature and size of risk
- Age and health status
- Risk of chronic illness
- Children vs. adults
- Transfer of values between countries