Ozone
Human Health Impacts

Royal Society Workshop 23/24th May

Introduction – Ross Anderson
Epidemiology – Heather Walton
Health impact assessment – Ross Anderson
Mechanisms – Frank Kelly

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Health Impacts
Key questions

- Does ozone have effects on humans?
  - Laboratory evidence
  - Population evidence

- What is the population health impact, now and in the future?

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How might air pollution affect health?

Acute effects

- Transient effects
- Exacerbation of other disease

Chronic effects

- Added risk factor for chronic diseases
- Induction of chronic disease

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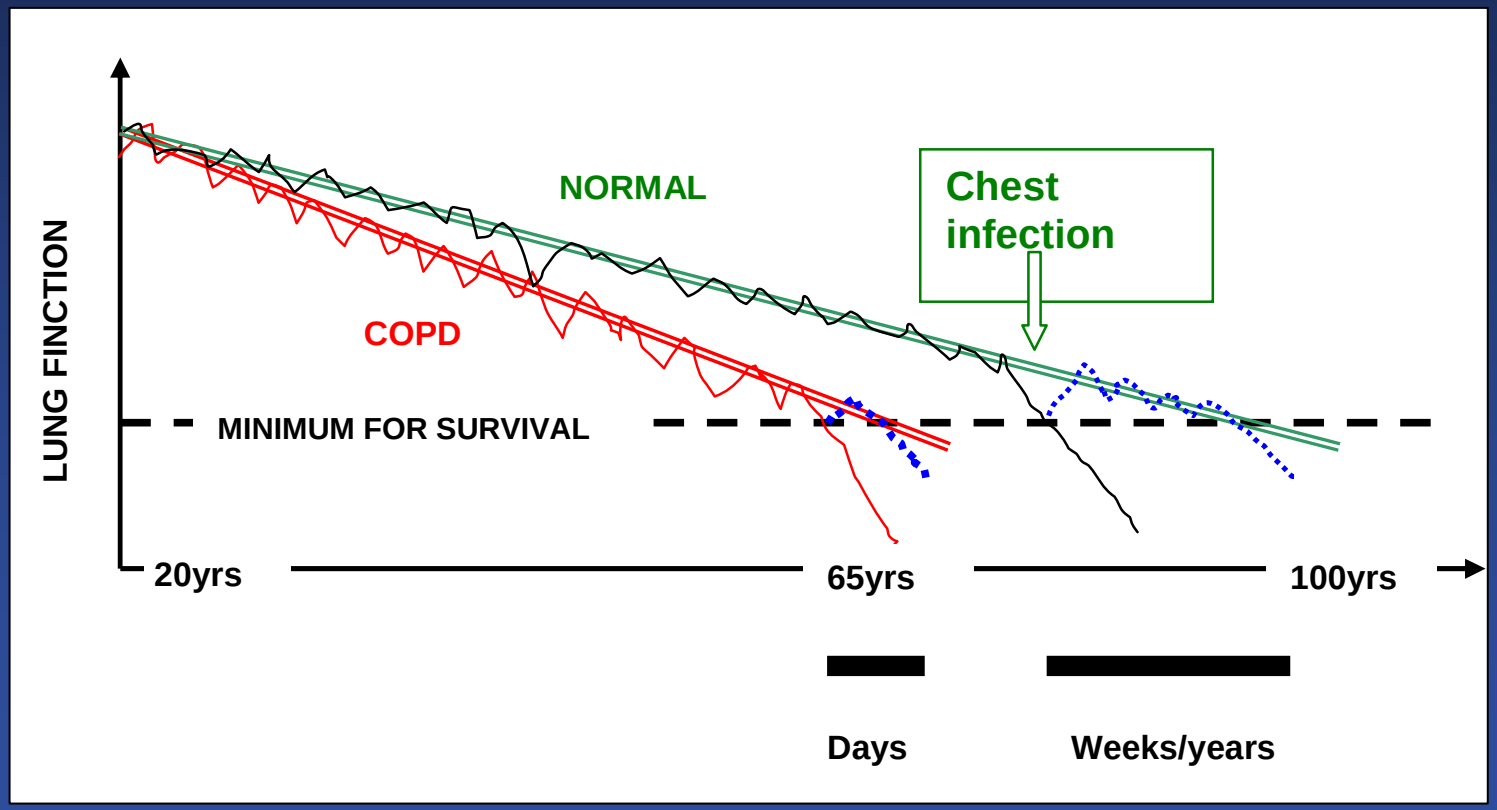
Model of acute and chronic effects of air pollution



What types of evidence are available?

- Lab studies (in vitro, animals, humans)
  - *Experimental (can infer cause and effect)*
  - *Relate to mechanisms*
  - *Show potential for adverse health effects*
  - *Less suitable for chronic exposures, complex mixtures, vulnerable subgroups*
- Epidemiological studies
  - *Observational (associations only)*
  - *Relate to real people and environments*
  - *Exposure is to mixtures and sources*
  - *Methods restricted by community exposure*

EVIDENCE FROM POPULATIONS

ASSOCIATIONS:
Air pollution and health

EXCLUDE:
Chance, Bias Confounding

OTHER EVIDENCE (Lab studies)

APPLY:
Scientific reasoning

Temporality
Dose response
Consistency
Coherence
Plausibility
Experiment

Size of effect
Specificity

JUDGEMENT:
Causality

"Precautionary principle"

POLICY

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