

# Environmental Tobacco Smoke



## Environmental Tobacco Smoke


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## What is ETS?

**Environmental Tobacco Smoke**  
 or  
**Second hand smoke**  
 or  
**Passive smoking**



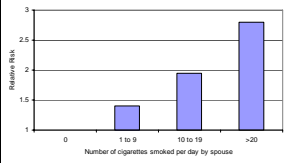
- Complex mixture of aerosols and gases, over 4000 components:
  - Mainstream Smoke (MS) is the smoke exhaled from the lungs of smokers during active smoking.
  - Sidestream Smoke (SS) is generated from the smouldering cigarette
  - Sidestream smoke dominates ETS and is considered to be more harmful



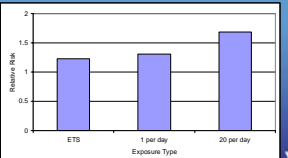
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## ETS Concerns


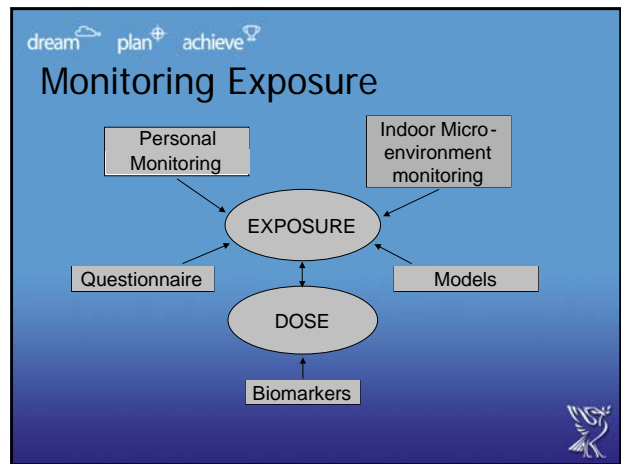
- Lung cancer
- Childhood illnesses
- Exacerbation of asthma
- Heart Disease



AK Hackshaw, MR Law, NJ Wald. The accumulated evidence on lung cancer and environmental tobacco smoke. *BMJ* 1997;315:980-988




M R Law, J K Morris, N J Wald. Environmental tobacco smoke exposure and ischaemic heart disease: an evaluation of the evidence *BMJ* 1997;315:973-980

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## ETS Markers for Air Sampling

- Carbon Monoxide**
  - Not specific to ETS
  - Easy to measure
- RSP**: Respirable suspended particles
  - Often not a well defined size fraction: PM<sub>2.5</sub>, PM<sub>3.5</sub> and PM<sub>10.0</sub>
  - Many other sources e.g. vehicles, cooking,
- ETS Specific Particles**
  - Varying ETS specificity
  - Sampling and analysis more complex
- Nicotine**:
  - ETS specific
  - Relatively easy to sample and analyse
  - Problems with absorption onto surfaces
- 3-ethenyl-pyridine**
  - 3-EP is tobacco specific
  - Similar to nicotine but reduced absorption problems




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## Case Study – Monitoring of ETS markers in pubs and bars



- Prior to July 2007 legislation pubs chose what policy to apply
- 2 Control options: **Non-smoking areas** & **Ventilation**.  
 But little research on their effectiveness.
- We examined this using area monitoring in Manchester pubs





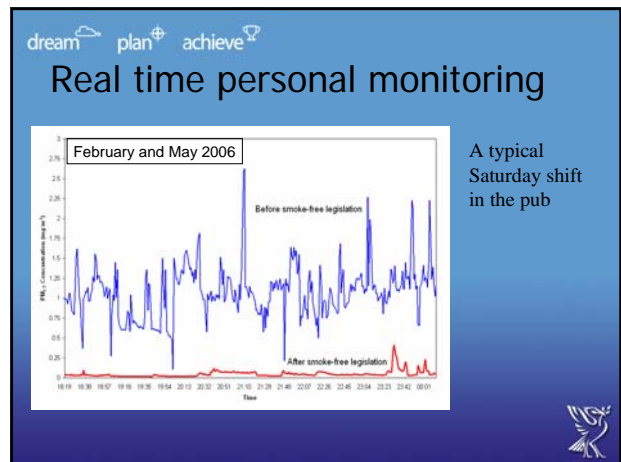
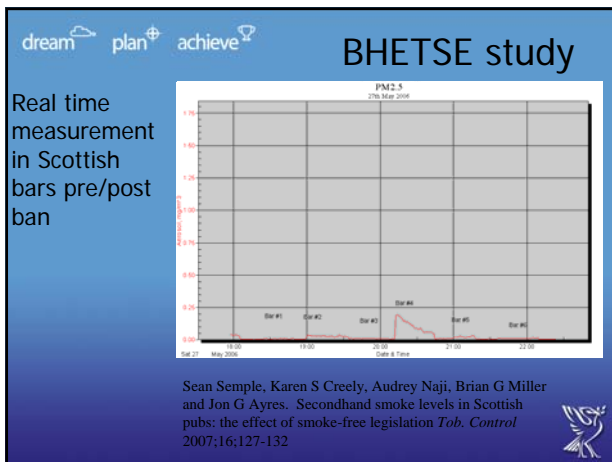
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## Real Time Measurements

- Over last 5 years equipment has improved allowing real time measurement of fine particles
- Practical for personal & area monitoring (0.5kg)
- Accuracy fine for ETS work ( $1\mu\text{g}/\text{m}^3$ )
- Allow shorter survey periods
- Not ETS specific so have been most useful for before/after & smoker/non-smoker studies



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## Current ETS work

- DoH funded Smokefree07 study of bars and bar staff before and after Smokefree legislation in England
- combines
  - air sampling
  - personal measurement
  - Cotinine measurement
  - Questionnaire survey
- 4 site study:
  - London
  - Liverpool
  - Cumbria
  - North East

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## Conclusions – ETS measurement

- Air sampling of RSP, ETS-particles and nicotine are useful markers but with limitations.
- Nicotine absorption can hinder comparisons between different areas
- RSP has other indoor sources but where cigarette sources are strong or changing real time measurement is useful
- Biomonitoring is useful but where the exposure occurs is not indicated
- Combination of measurement strategies required to suit the study purposes**