

# Air Quality and Health

**Dr Liz Robin**  
**Director of Public Health**  
**Cambridgeshire County Council**

## Scale of the problem

It is estimated that **long-term exposure to man-made air pollution in the UK** has an annual effect equivalent to:



**28,000 to  
36,000  
deaths**

Over the following 18 years a **1  $\mu\text{g}/\text{m}^3$  reduction in fine particulate air pollution in England** could prevent around:



**50,900** cases  
of coronary heart disease

**16,500** strokes



**9,300** cases of asthma

**4,200** lung cancers

**Behavioural risk factors**

Dietary risks

Tobacco smoke

Low physical activity

Alcohol & drug use

**Metabolic risk factors**

High systolic blood pressure

High body mass index

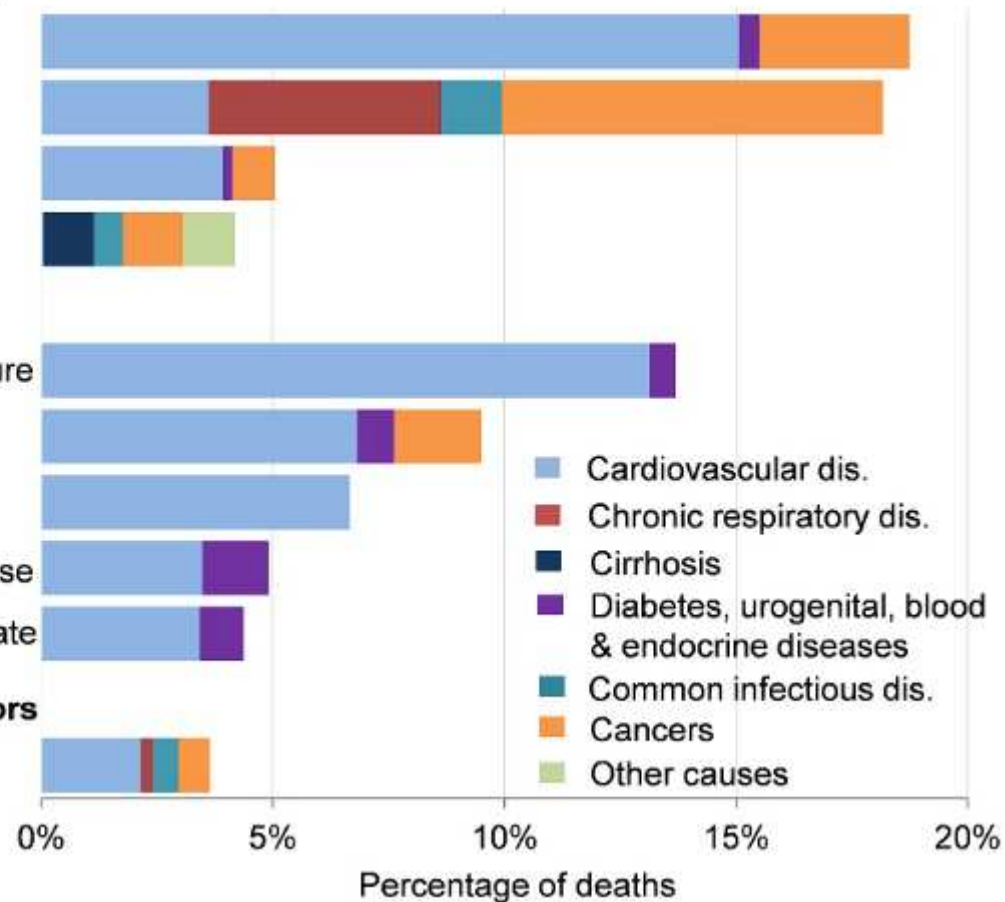
High total cholesterol

High fasting plasma glucose

Low glomerular filtration rate

**Environmental risk factors**

Air pollution



# The Key Air Pollutants



- ◆ Air pollution is a complex mix of particles and gases of both natural and human origin.
- ◆ Particulate matter (PM) and nitrogen dioxide (NO<sub>2</sub>) are both major components of urban air pollution.
- ◆ Currently, there is no clear evidence of a safe level of exposure below which there is no risk of adverse health effects. Therefore, further reduction of PM or NO<sub>2</sub> concentrations below air quality standards is likely to bring additional health benefits.

## Health effects of air pollution

### short-term effects

exacerbation  
of asthma

cough, wheezing  
and shortness  
of breath

episodes of high air  
pollution increase  
respiratory and  
cardiovascular hospital  
admissions and mortality

### long-term effects

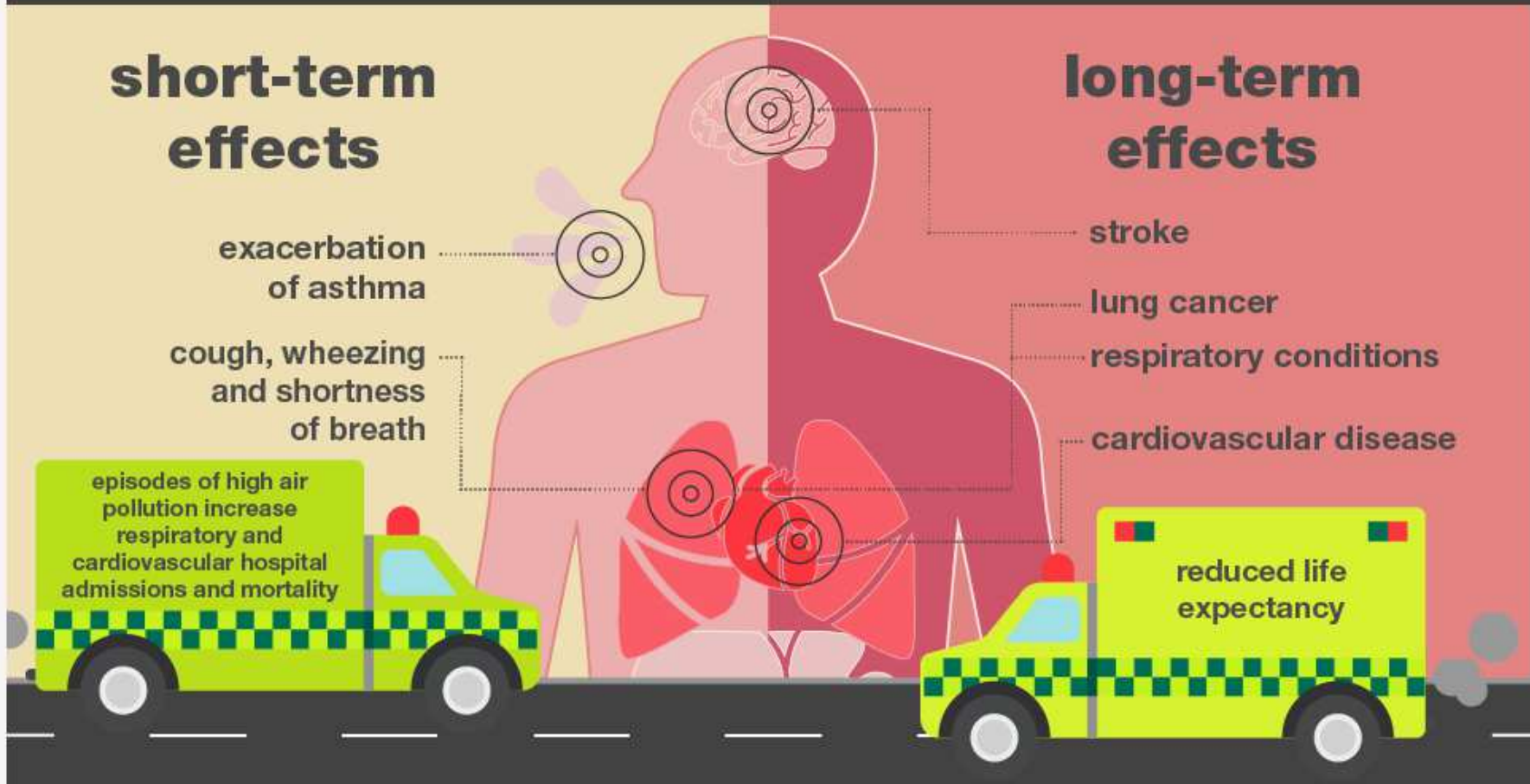
stroke

lung cancer

respiratory conditions

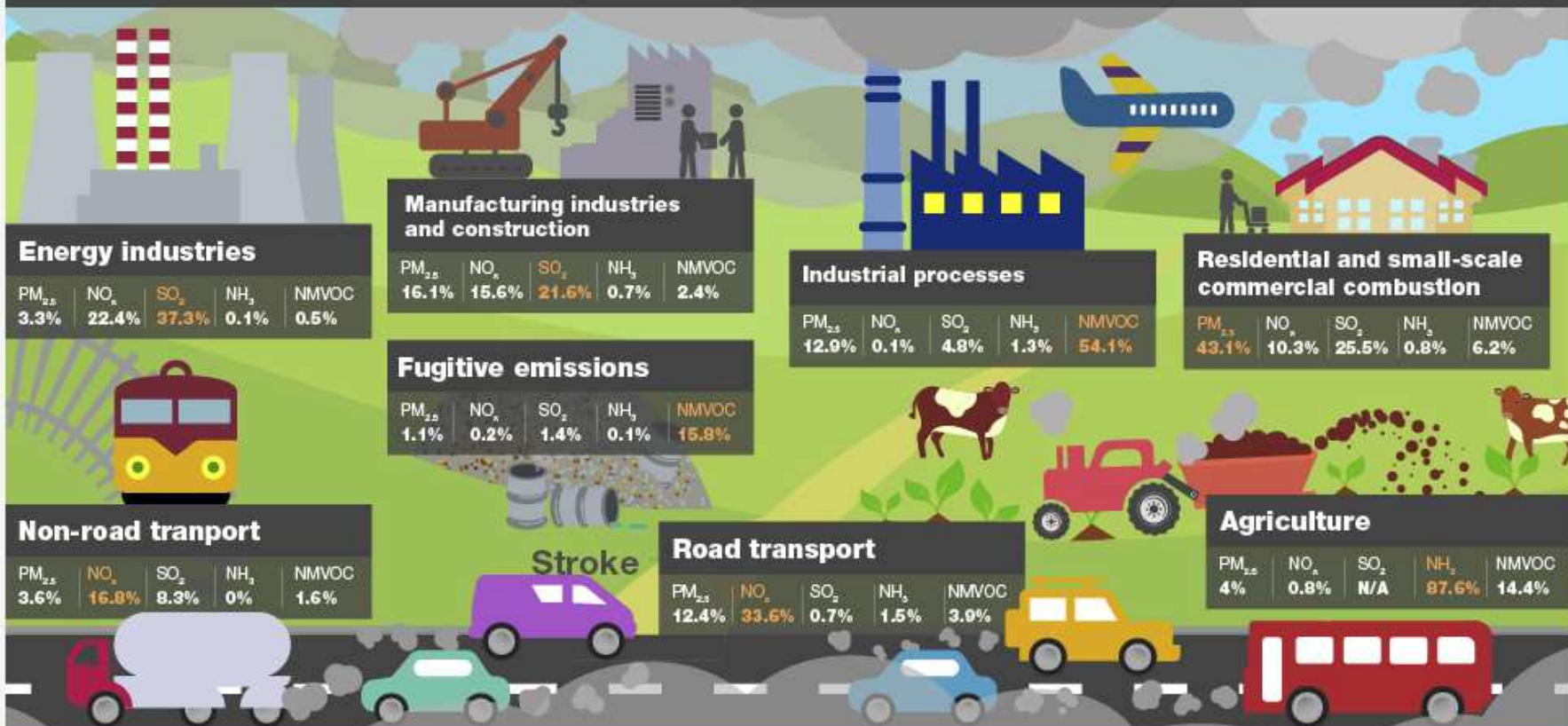
cardiovascular disease

reduced life  
expectancy





## Sources of air pollution



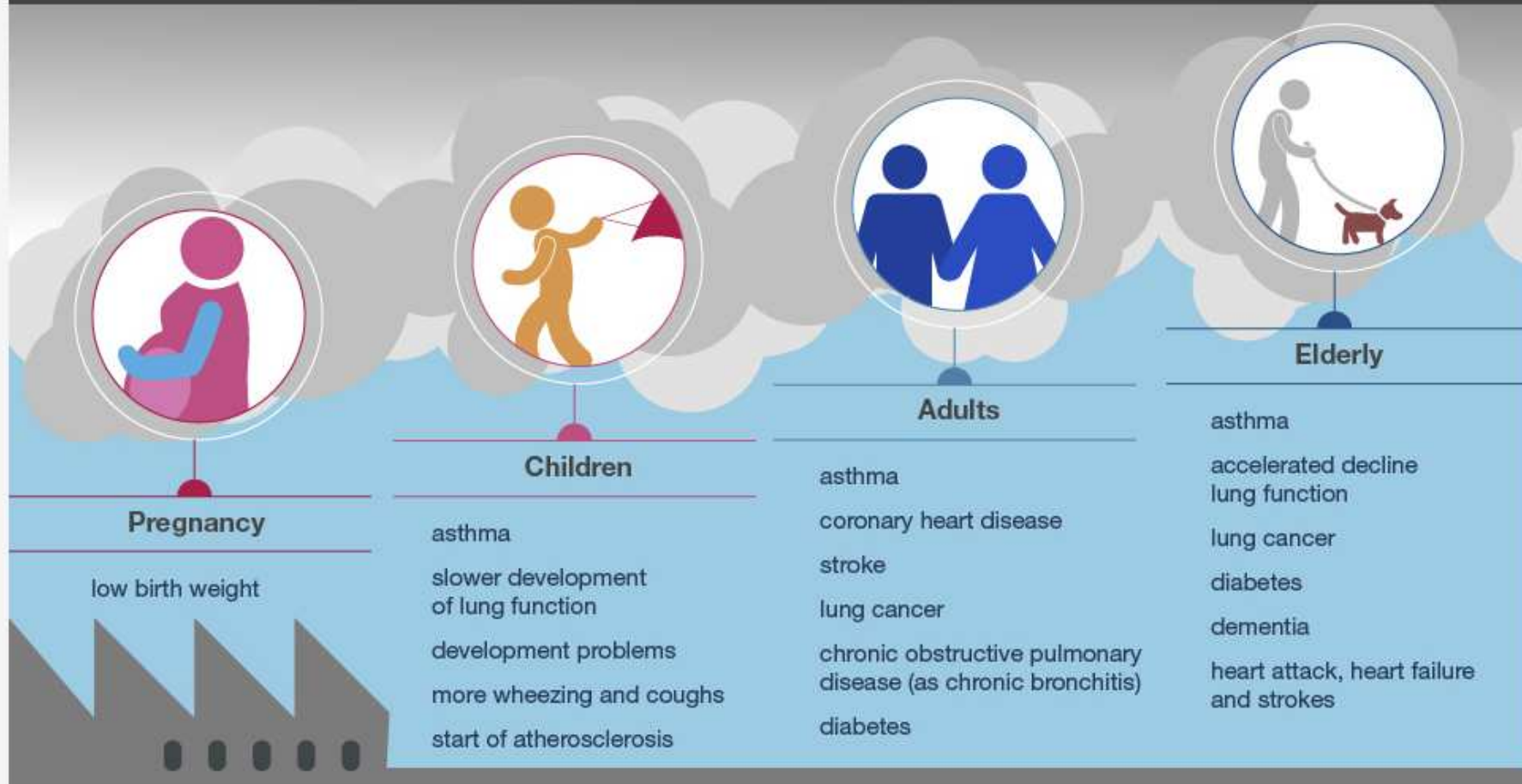
**Pollution substances:**

SO<sub>2</sub> - Sulphur dioxide  
NO<sub>x</sub> - Nitrogen oxides

NH<sub>3</sub> - Ammonia  
PM<sub>2.5</sub> - Primary particulate matter

NMVOCs - Non-methane volatile organic compounds

## Air pollution affects people throughout their lifetime



## Air pollution affects everyone but there are **inequalities in exposure** and the **greatest impact on the most vulnerable**

older people  
(65 and older)



pregnant women



communities with  
poorer air quality  
(eg. those situated  
closer to main roads)

children



those with  
cardiovascular  
disease and/or  
respiratory disease





# Health and Wellbeing Co-benefits



- ◆ Air pollution is not an issue that occurs in isolation. Pollution can be associated with other environmental hazards that affect health, and it can contribute to health inequalities. However, measures that improve air quality can also offer wider public health and wellbeing co-benefits, including:
  - ◆ an improvement in overall environmental quality,
  - ◆ increased physical activity,
  - ◆ noise reduction,
  - ◆ greater road safety and
  - ◆ climate change mitigation.
- ◆ Multiple interventions, each producing a small benefit, can act cumulatively to produce significant overall benefits.

## Create opportunities and promote active travel

Addressing air pollution by providing **good quality infrastructure** and **public transport** and encouraging people **to walk** and **cycle** rather than drive can help people to become fitter and healthier.

