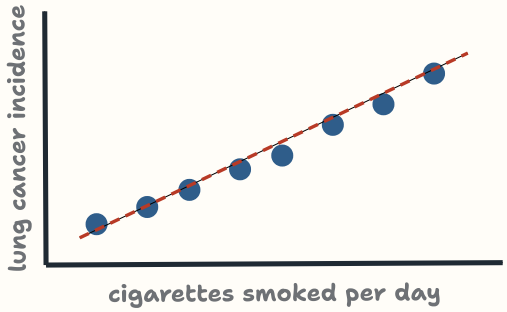
Smoking, Pollution and Lung Disease Data

A positive correlation between smoking and lung disease does not prove causation; a mechanism and controlled repeated studies support it.

A correlation is not proof of cause: a mechanism and controlled studies are needed



positive correlation

smoke: tar (carcinogens)

mutations in lung cell DNA

uncontrolled division: cancer

repeated studies: laws

mechanism + evidence supports causation

Key terms

risk factor	something that increases the likelihood of a disease developing.
correlation	a link between two variables; it does not prove one causes the other.
causal relationship	a change in one variable directly causes a change in the other, supported by a mechanism.
incidence	the number of new cases of a disease in a population over a given time.
carcinogen	a substance, e.g. in tar, that causes mutations and can lead to cancer.
statutory restriction	a law passed by government, e.g. smoking bans in public places, based on evidence.

I can...

- [ ] Interpret data on effects of pollution and smoking on incidence of lung disease
- [ ] Analyse and interpret data on risk factors
- [ ] Evaluate how experimental data led to statutory restrictions
- [ ] Recognise correlations and causal relationships

EXAM TRAP

For correlation questions, give both halves: describe the correlation and say it does not prove causation. Then name a specific other variable (age, air pollution, occupation) that could differ.

4 marks: what earns them

1. Positive correlation: the more cigarettes smoked, the higher the incidence; but correlation alone does not prove causation
   Not: smoking causes lung cancer with no mention of correlation; the graph goes up with no link stated
2. Other variables (e.g. age, air pollution, occupation, family history) may differ between groups and could affect incidence
   Not: other things with no example or effect; the sample was small alone
3. A causal link is supported by a mechanism: chemicals in smoke (tar) are carcinogens that cause mutations in lung cells
   Not: smoke is harmful alone; nicotine causes cancer
4. Consistent results from many studies with other variables controlled led governments to pass laws (statutory restrictions), e.g. smoking bans in public places
   Not: the government banned it because it is bad, with no reference to evidence

Remember

Describe the link, then say not proof.
Name another variable that could matter.
Mechanism plus repeated studies gives laws.

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