

# This session

1. Review of case-control and cohort studies designs
2. What is a biobank?
3. Small group activity: case-control and cohort designs  
Exercise (30 minutes)  
Presentation (30 minutes)
4. Review of STAT 1-3 MCQs

## Observational studies

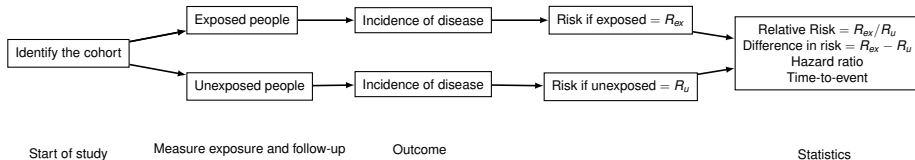
- The investigator simply observes...
- ...but has control over:
  - **choice of subjects**
  - **follow subjects prospectively or retrospectively**
  - **size of the sample**

## Randomised controlled trials

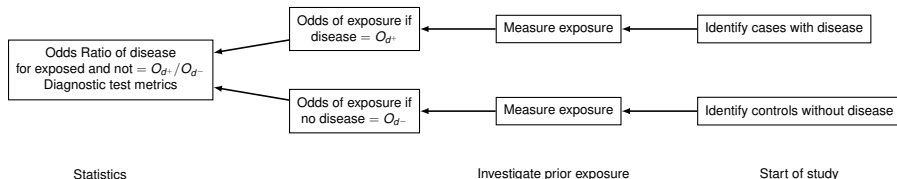
Examine the relative efficacy of treatments or **interventions** in human subjects.

# Case-control and cohort studies

## Cohort study



## Case-control study



# Measuring outcomes

- Cohort study: Relative Risk
- Case-control study: Odds Ratio

Risk factor	Cases with disease	Controls without disease
Exposed	a	b
Not exposed	c	d

Table:  $OR = \frac{a/c}{b/d}$

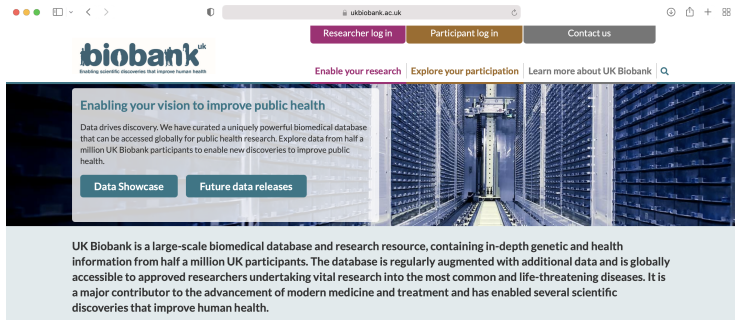
Developed the disease	Exposed	Not exposed	Total
Yes	a	b	a+b
No	c	d	c+d

Table:  $RR = \frac{a/(a+c)}{b/(b+d)}$

# What is a biobank

## A new kind of large cohorts

**Biobanks:** large biomedical databases containing data on participants from traditional questionnaires, in addition to biological samples, for instance to help evaluate the association between genetic variation, environmental exposures for risk of disease.



The screenshot shows the UK Biobank website. At the top, there's a navigation bar with the URL 'ukbiobank.ac.uk' and buttons for 'Researcher log in', 'Participant log in', and 'Contact us'. Below this is a header with the 'biobank' logo and the tagline 'Building scientific discoveries that improve human health'. The main content area features a large image of a server room with a central aisle. Overlaid on the left side of this image is a text box titled 'Enabling your vision to improve public health' which states: 'Data drives discovery. We have curated a uniquely powerful biomedical database that can be accessed globally for public health research. Explore data from half a million UK Biobank participants to enable new discoveries to improve public health.' Below this text are two buttons: 'Data Showcase' and 'Future data releases'. At the bottom of the page, a paragraph describes the UK Biobank as a large-scale biomedical database and research resource, containing in-depth genetic and health information from half a million UK participants, and notes its global accessibility and contribution to medical research.

ukbiobank.ac.uk

Researcher log in Participant log in Contact us

Enable your research Explore your participation Learn more about UK Biobank

**Enabling your vision to improve public health**

Data drives discovery. We have curated a uniquely powerful biomedical database that can be accessed globally for public health research. Explore data from half a million UK Biobank participants to enable new discoveries to improve public health.

Data Showcase Future data releases

UK Biobank is a large-scale biomedical database and research resource, containing in-depth genetic and health information from half a million UK participants. The database is regularly augmented with additional data and is globally accessible to approved researchers undertaking vital research into the most common and life-threatening diseases. It is a major contributor to the advancement of modern medicine and treatment and has enabled several scientific discoveries that improve human health.

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  - Large numbers of healthy control blood (also urine and saliva).

# Question 1

## Which study design is appropriate?

How would you design a study to investigate whether or not a proposed biomarker (or a combined panel of biomarkers) is an effective tool for identifying those at high risk of pancreatic cancer, in order to enable early detection of pancreatic cancer?

## Question 2

How measure?

What summary measure of risk associated with the biomarker could you use for each study?

# Main research question

## We've got funding!

Assume that Cancer Research UK is going to fund **two different studies** to investigate **whether your research group's biomarker panel can help stratify risk of pancreatic cancer**, and enable early detection that might lead to improvements in public health outcomes. One will be a **case-control study**, that will report its results within 3 years and the other will be a **cohort study** which will report its results within 13 years.

# Review of MCQ from STAT1 - STAT3

Join the menti quiz:

Join the poll at the link

<https://www.menti.com/zc2nq3h3mq>

Or go to <https://www.menti.com> and use the code **2106 7080**.

