

Module 5 Questions:

1. Using the following data, estimate the OR in favour of Myocardial Infarction (MI) over three years for an OC user compared with a non-OC user (i.e. the disease odds ratio):

MI incidence (3 yrs) OC-use group	Yes	No
	YES	4987
NO	7	9993

2. A GWAS question: Researchers conducted a small case-control GWAS to identify whether specific SNP alleles are associated with a disease.
For each SNP, you are given:

- **Risk Allele** (the allele being tested)
- **Cases with allele**
- **Cases without allele**
- **Controls with allele**
- **Controls without allele**

Use the contingency table format and compute **odds ratios** for each SNP.

SNP	Risk Allele	Cases With	Cases Without	Controls With	Controls Without
rs501	G	55	45	35	65
rs612	T	20	80	25	75
rs723	C	60	40	60	40
rs834	A	15	85	30	70

1. For each SNP, construct a 2×2 table

Use:

	Cases	Controls
Risk allele present	a	b
Risk allele absent	c	d

Fill in a, b, c, d for each SNP.

2. Calculate the odds ratio (OR)

Use:

$$OR = \frac{a \times d}{b \times c}$$

Compute OR separately for rs501, rs612, rs723, and rs834.

3. Interpret each OR

For each SNP:

- $OR > 1 \rightarrow$ risk allele **increases** odds of disease
- $OR < 1 \rightarrow$ risk allele **protects**
- $OR \approx 1 \rightarrow$ **no association**

Identify which SNP looks most strongly associated and which shows none.

4. (Optional challenge)

Rank the SNPs from strongest \rightarrow weakest association.