

Relative risk and absolute risk difference

The same study can sound very different depending on how the numbers are presented.

*More questions.
Healthier choices.
Tomorrow.*

Relative and absolute measures provide different but complementary information. Absolute risk is the probability in each group; the risk difference expresses the absolute change. The risk ratio and relative percentage change describe that change relative to the starting risk.

What do they mean?

% Risk ratio and relative change

- Risk ratio compares risks by division.
- Relative percentage change compares the difference with the starting risk.
- Neither shows how large the absolute risk is.

Example: The same study, two different messages

Let's say 100 people are followed for 1 year.

Without exposure
(e.g. no specific factor)



2 out of 100 people
develop the condition
(2%)

With exposure
(e.g. with specific factor)



3 out of 100 people
develop the condition
(3%)

Both measures are important

- Risk ratio describes the multiplicative comparison.
- Absolute risks show the probability in each group.
- Risk difference shows the absolute change. Balanced interpretation usually needs all three.

Absolute risk and risk difference

- Absolute risk gives the probability in each group.
- Risk difference subtracts the two absolute risks.
- Together they show the baseline risk and the absolute change.

How is it calculated?

Risk ratio (RR)
 $3\% \div 2\% = 1.5$

Relative increase
 $(3\% - 2\%) \div 2\% = 50\%$

Risk difference (RD)
 $3\% - 2\% = 1$ percentage point

1 additional case
per 100 people



Important:

A large relative increase can look dramatic, but if the starting risk is very low, the absolute difference may be small and may have little practical or clinical significance for most people.

Another example: A larger starting risk

The same relative increase (50%), but with a higher starting risk.

Without exposure



20 out of 100 people
develop the condition
(20%)

With exposure



30 out of 100 people
develop the condition
(30%)

Relative increase: 50%
Risk ratio: 1.5

Risk difference:
10 percentage points
(10 additional cases per
100 people)



The same relative risk can lead to very different absolute differences depending on how large the starting risk is.

When you see a number for risk, ask:

- ☐ Is this a risk ratio, a relative change or an absolute risk?
- ☐ What is the starting (baseline) risk?
- ☐ What time period does the result refer to?
- ☐ Which population was studied?
- ☐ How large is the risk difference?
- ☐ Does this have real meaning for me or for people like me?

*Critical questions
today.
A healthier
tomorrow.*

