

What is Attributable Risk?

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Attributable risk refers to the difference in incidence rates between people exposed to some risk factor vs. people not exposed to the risk factor.

For example, we might use this metric to understand the difference in cardiovascular disease (the incidence) between smokers (people exposed) and non-smokers (people not exposed).

Typically we calculate **attributable risk percentage**, which refers to the percentage of an incidence rate that can be attributed to some risk factor.

We can also calculate **population attributable risk percentage**, which refers to the percentage of an incidence rate in the overall population that can be attributed to some risk factor.

Given the following contingency table:

	Disease	No Disease
Exposed	A	B
Not Exposed	C	D

Attributable risk can be calculated as:

$$AR = (A/(A+B)) - (C/(C+D))$$

Attributable risk percentage can be calculated as:

$$AR \% = AR / (A/(A+B)) * 100$$

Population attributable risk percentage can be calculated as:

$$PAR \% = / ((A+C) / N) * 100$$

where N is the sum of all cells in the contingency table.

The following example shows how to calculate each of these metrics.

Example: Calculating Attributable Risk & Other Metrics

The following table shows the number of people who developed cardiovascular disease based on their smoking history:

	Disease	No Disease
Smoked	25	140
Did Not Smoke	52	683

$$AR = (A/(A+B)) - (C/(C+D))$$

$$AR = (25/(25+140)) - (52/(52+683))$$

$$AR = .08077$$

The **attributable risk percentage** of smoking can be calculated as:

$$AR \% = AR / (A/(A+B)) * 100$$

$$AR \% = .08077 / (25/(25+140)) * 100$$

$$AR \% = \mathbf{53.31\%}$$

This means 53.31% of incidence of cardiovascular disease among smokers is attributable to their smoking.

The **population attributable risk percentage** of smoking can be calculated as:

$$PAR \% = / ((A+C) / N) * 100$$

$$PAR \% = / ((25+52) / 900) * 100$$

$$PAR \% = \mathbf{17.31\%}$$

This means 17.31% of incidence of cardiovascular disease in the population is attributable to smoking.

In other words, if smoking were eliminated in the population then we would expect to see a 17.31% reduction in cases of cardiovascular disease.

Bonus: Attributable Risk Calculator

Feel free to use the to automatically calculate the attributable risk, attributable risk percentage, and population attributable risk percentage for any 2x2 contingency table.