Research in Surgery

Relative Risk

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Abstract:

Relative risk (RR) quantifies the incidence of disease in an exposed group in comparison to the incidence in an unexposed group. A higher RR value signifies an increased likelihood of disease occurrence among individuals exposed to the specified risk factor relative to those who are not exposed.[1,2]

Introduction

Relative risk is a fundamental metric in the field of epidemiology, providing insights into the probability of disease occurrence among individuals exposed to pathogenic risk factors and conditions. For example, women with first-degree relatives (such as sisters or mothers) diagnosed with breast cancer experience a fourfold increase in their lifetime risk of developing the disease compared to women without such a familial history.[4]

As a specific case study, the incidence of skin cancer can be evaluated among fishermen and farmers in relation to other community members who are not exposed to sunlight.

Calculating Relative Risk: Relative risk can be calculated directly in cohort studies. The following scenarios illustrate this calculation:

a) Farmers who are exposed to sunlight and have developed skin cancer.

b) Farmers who are exposed to sunlight and have not developed skin cancer.

c) Miners who are not exposed to sunlight and have developed skin cancer.

d) Miners who are not exposed to sunlight and have not developed skin cancer.

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Received: 23/05/2026

Please cite this article as follows:
Mirmalek S. A. Relative Risk. Iranian Journal of Surgery. Vol. 34, No. 3, Autumn 2026, doi: ???

	Patient	Healthy	
	a	b	Exposure to sunlight
	c	d	Avoiding exposure to sunlight

The incidence of skin cancer in the exposed group (e.g., group a) is computed by dividing the number of patients at risk by the total number of individuals in that group who have been exposed (the remaining farmers in the study who have not developed the disease).

Conversely, the incidence of skin cancer in the unexposed group (e.g., miners who are not exposed to sunlight) is determined by dividing the number of patients with skin cancer in that group by the total population under study that has not been exposed to sunlight (for example, the miners).[2]

Comparison to Odds Ratio: It is vital to recognize that relative risk cannot be measured in a cross-sectional study.[4]

Similarly, relative risk cannot be estimated in case-control studies. However, under certain conditions, the odds ratio can serve as a reasonable approximation of relative risk:

a) When the disease in question has low prevalence in the population.

b) When the cases under investigation accurately represent all individuals with the disease within the selected population concerning exposure history.

c) When the control group accurately represents all non-diseased individuals in the selected population regarding exposure to the causative factor.[2-6]

An odds ratio of one indicates that the identified risk factor exerts no effect on disease occurrence.

A value greater than one suggests an increased likelihood of disease associated with that risk factor.

Conversely, a value less than one implies a potential protective effect against disease occurrence when exposed to that risk factor. For instance, the utilization of umbrellas and shade among a population exposed to sunlight may illustrate a reduction in skin cancer incidence compared to farmers who do not employ these protective measures.[6]

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