

# **Refining Estimate of Attributable Risk for Case-Control Studies**

Dane W. Wu

Department of Mathematics

Pacific Lutheran University, Tacoma, WA 98447, USA

**Abstract:** This paper presents two alternate formulas for estimating attributable risk (AR). One of the formulas provides another interpretation of AR and leads to the discovery of relative attributable risk (RAR), a refined measure of attributable risk. It has been proved that RAR has a number of appealing theatrical properties. In this paper, some applications of RAR in case-control studies with stratification will be explored and a real set of data on esophageal cancer study will be used to demonstrate the advantages of the RAR.

## **1. Introduction**

The attributable risk, which has also been referred to various names such as the attributable fraction [5] and population attributable risk percent [2], provides an estimate of the proportion of cases that are related to a given exposure. It is usually interpreted as the fraction of disease in a population that might be avoided by reducing or eliminating exposure to an etiologic agent, provided that it is causative [9]. The information gained from AR estimates may contribute to the choice of disease prevention strategies for the public health. Studies of AR can be dated back to the early 1950s [4].