

**Article III**

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## A Scaled Sample Space Cube Used to Illustrate Attributable Fractions

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### Summary

A three-dimensional graphic method is proposed for displaying the association structure between multiple explanatory variables and their relation to a categorical response. The method combines the techniques of mosaic displays and scaled Venn diagrams, and is especially useful for illustrating attributable fractions in epidemiology. The primary purpose is to show the reduction of disease risk in a population if the joint exposure distribution or the conditional risk function is modified, and the method can be extended to illustrate the potential effects of successive removal of exposures on the overall risk of disease. The scaled sample space cube may be used for communicating the difficult concept of attributable fraction to statisticians, the medical community and the general public in an easily understandable way. Demonstrations of the method use theoretical models as well as data from the Hordaland study on the effect of smoking and occupational exposure on obstructive lung disease. Also, the general principle of adding a third dimension to a mosaic display, instead of using shading or colouring, to show an attribute of a cell in a multiway contingency table, can be helpful for other purposes, as in residual analysis of a loglinear model fitting.

**Key words:** Logistic regression; Mosaic display; Scaled Venn diagram; Generalized attributable fraction; Ordered preventive strategies; Obstructive lung disease.