UNIVERSITY OF MINNESOTA
TWIN CITIES

Division of Epidemiology
School of Public Health
Stadium Gate 27
611 Beacon Street S.E.
Minneapolis, Minnesota 55455
(612) 624-5400

October 6, 1987

Russell L. Smith, Ph.D.
Vector Enterprises, Inc.
1550 Seventeenth Street
Santa Monica, CA 90404

Dear Doctor Smith:

I am sorry if there was a lack of clarity in our AHA report on coronary heart disease risk associated with total serum cholesterol levels. One calculates risk curves, as the Framingham people have done for years, with curvilinear regression models in which the rate of new events is regressed against serum cholesterol level. This is done by measuring serum cholesterol levels in large numbers of healthy people and then computing the 4, 6, 8, 10, etc. - year coronary disease rates. The unique aspect of our figure, which was prepared by Geoffrey Rose at the University of London, is the concept of Population Attributable Risk which is defined in the legend of the figure. It represents the excess CHD events that can be attributed to high cholesterol levels in a whole population. It is computed by relating individual relative risk to absolute risk and then to the number of people in a population in various parts of the cholesterol distribution. Thus, very high individual risk, at the upper end of the distribution of cholesterol values, translates into low population attributable risk because the number of people in a population with such cholesterol levels is small. The death or incidence rate is certainly not lower at the upper end of any distribution of cardiovascular disease risk factor, whether it be number of cigarettes smoked, level of blood pressure, level of serum cholesterol, or all combined. I agree with you that smaller units on the graph would give a more normal distribution with the characteristics skewness to the right, than the groupings that Dr. Rose used to prepare the Framingham histogram.

The enclosed is further discussion of the issue of whether the relationship is a continuous one. That is pretty well settled now by the six year follow-up of 360,000 men from the recruitment for the MRFIT Trial. In those data, whether by straightforward cross-classifications or regression models a geometric increase in risk is found as a result of combining the risk factors.

I cannot quite diagnose where the block is in your understanding of these issues, but it may have to do with the fact that we are dealing with prediction and you seem to be thinking of cross-sectional associations between risk factor and disease. We are dealing with the rates and the odds of developing future events, derived from long-term follow-up of large numbers of people on whom characteristics have been measured during health. This is the most fundamental observational approach of epidemiology. Independent prediction is a much more powerful metho-

dology than comparison of characteristics of cases versus controls at a particular time.

Cordially,

Henry Blackburn, M.D.
Professor and Director

/nmf

Enclosures