Anger Prone Personality and Coronary Heart Disease

Acknowledgement: This lab is based on a UNC EPID 600 lab of the same name. I have modified and simplified this lab to accommodate the SJSU curriculum and textbook *Epidemiology Kept Simple* (3e).

Background: The Atherosclerosis Risk in Communities Study (ARIC) is a multi-site epidemiologic project funded by the National Heart Lung and Blood Institute (NHLBI) of the National Institutes of Health (NIH) to study cardiovascular disease in the U.S. population. The study enrolled people in four communities, each studied by a different team of investigators, who worked under the direction of a steering committee for the study. People who enrolled in the study had thorough medical examinations and completed extensive questionnaires. Participants were re-examined after several years and again several years later. One of the examinations that participants underwent was measurement of the thickness of the walls of their carotid arteries, with B-mode ultrasound, a technique that was fairly new when ARIC began. Atherosclerosis in the carotid arteries serves as an indicator of atherosclerosis elsewhere in the arterial bed, so this measurement provided a non-invasive measure of subclinical atherosclerosis that could lead to coronary events and strokes. This study by Williams and coworkers (2001) used data from the ARIC study to look at angry temperament in relation to coronary heart disease risk.

Article: Download and read this article:

> Williams, J.E., et al. (2001). Effects of an angry temperament on coronary heart disease risk: The Atherosclerosis Risk in Communities Study. *American Journal of Epidemiology* 2001; 154(3):230-235.
> Link: http://www.sjsu.edu/faculty/gerstman/eks/Williams2001.pdf

Questions

(1) Identify the main exposure variable in this study. How was it measured? Identify the study outcomes. How were they measured?

(2) Explain why it is probably not feasible to conduct an experimental study to address the current issue.

(3) The subjects in this study were recruited to form the ARIC cohort at a baseline visit (1987 – 89) who returned to visit 2 (1990 – 92). A total of 14,348 persons were examined at this second visit. Williams and coworkers (2001) excluded 1,140 participants with a history of myocardial infarction (MI), coronary bypass surgery, or electrocardiographic evidence of MI, as well as an additional 222 participants most of whom were missing data on hypertension or the anger scale, leaving 12,990 participants for analysis. What is the reason for excluding the 1,140 participants with evidence of clinical coronary heart disease?

(4) A different article by Williams and coworkers explains that subjects at visit 2 represented about 93% of those examined at the baseline. How might losing 7% of the original cohort by the second visit affect the study results? [Hint: See pages 210-211 in the third edition of *Epidemiology Kept Simple*.]

(5) Table 1 on page 231 of the article presents selected characteristics of study subjects for each category of hypertension and anger-temperament score. The primary differences between those with low and high anger-temperament scores appear to be in gender, education level, cigarette smoking, alcohol consumption, HDL cholesterol, and wait-to-hip ratio. What are the implications of these differences when comparing the cohorts? [Hint: See Figure 9.6 in the third edition of *Epidemiology Kept Simple*.]

(6) Participants were recruited during their second clinic examination visit ("initiation exam"), which occurred between 1990 and 1992. They were followed up through December 31, 1995. How many person-months would a subject contribute if their initiation exam visit took place on December 31, 1990 and the subject did *not* experience a CHD event? How many person-months would a subject contribute if their initiation exam visit took place on June 30, 1992 and the subject experience a CHD event on January 1, 1994.

(7) Table 3 on page 232 of the article lists the number of participants by hypertension and anger-temperament trait categories. What were the crude[a] incidence proportions ("risks") of CHD within each of these groups?

       (a) Normotensive (N) with low (LA) anger-temperament scores
       (b) Normotensive (N) with high (HA) anger-temperament scores
       (c) Hypertensive (H), low (LA) anger-temperament scores
       (d) Hypertensive (H), high (HA) anger-temperament score

(8) Interpret the findings. Does this article suggest that the high-anger trait is a risk factor for CHD?

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[a] A crude incidence is one that has not been adjusted for confounding factors.