

## ***This Week's Citation Classic***

**Kannel W B, Dawber T R, Kagan A, Revotskie N & Stokes J.** Factors of risk in the development of coronary heart disease—six-year follow-up experience. *Ann. Intern. Med.* 55:33-49. 1961. [National Heart Institute. National Institutes of Health, Dept. Health, Education, and Welfare. Bethesda. MD]

**The paper reports on a six year study of a representative general population sample of men and women aged 30-59, covering factors related to the development of coronary heart disease (CHD). During the period of observation 186 men and women developed CHD. There was a 13:1 male predominance under age 45, reduced to 2:1 at ages 45-62. [The *SCP*<sup>®</sup> indicates that this paper has been cited over 350 times since 1961.]**

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"At the time of the 1961 *Annals of Internal Medicine* report, an epidemiological approach to unraveling the causes of chronic cardiovascular diseases was novel. Epidemiology has since undergone metamorphosis. The epidemiologist now explores the way morbid processes arise, evolve, and terminate fatally in relation to possible factors that may affect it, identifying highly vulnerable persons and the personal attributes and living habits which make them vulnerable.

"Since the *Annals* report in 1961, additional information has accumulated on the incidence of cardiovascular diseases, the clinical spectrum in all who have it, the identity of those vulnerable to it, its importance as a force of morbidity and mortality, and the chain of events leading to its occurrence. Numerous clues to its pathogenesis have been provided.

"Determinants of cardiovascular disease have been defined in terms of atherogenic personal attributes, living habits which affect these or precipitate attacks, early indicators of preclinical disease and host susceptibility to all these influences. As a consequence of the report's being so widely cited, epidemiologic investigations over the past decade have provided physicians with a broader concept

of cardiovascular disease, which includes its latent or presymptomatic phase. Concepts of 'normality' have changed from usual to optimal.

"The concept of the cardiovascular risk profile has now been firmly established and validated. Nevertheless, there remain many controversial and unresolved issues. The hazards of obesity, the benefits of physical activity and the importance of most psychosocial factors are still being disputed. The hazards of the cigarette are now well established but the exact pathogenetic mechanism involved is still in contention. Coffee and alcohol appear to have been falsely indicted as contributors to atherosclerotic cardiovascular disease. The role of diet in determining serum lipid values and through them, the incidence of cardiovascular disease, is still hotly disputed.

"New concepts about the influence of serum cholesterol have evolved identifying an LDL fraction which is atherogenic and an HDL component which is protective. Since that report, triglycerides have also been indicted, but appear to have been overemphasized.

"A number of misconceptions about hypertension have been uncovered which contributed to undertreatment of this powerful promoter of cardiovascular disease. The role and mechanism of action of diabetes in cardiovascular disease clearly need further elaboration.

"Cardiovascular risk profiles which synthesize the major risk factors quantitatively into a composite risk estimate have been devised and handbooks constructed to facilitate their application. Multiple risk factor intervention trials have been undertaken using these profiles to identify high risk candidates for prophylactic intervention.

"The optimal time to begin such prophylactic endeavors against atherosclerotic disease is in dispute, but is increasingly viewed as a pediatric problem.

"There has been a recent 20% decline in cardiovascular mortality. Whatever its cause, it is clear that it is environmentally related and that the change in life-style required is neither drastic nor unacceptable. Thus, the original article back in 1961 may well have made some impact where it counts."