

# Socioeconomic Considerations in the Primordial Prevention of Cardiovascular Disease<sup>1</sup>

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**Economic policy is an important determinant of population health; it is part of health policy. True primordial prevention of cardiovascular disease (CVD) may require regulation of the domestic and international market forces which produce and distribute CVD risk factors and their determinants. Because the market does not bear the cost of the legacy of poor health that it generates, primordial prevention of CVD may need to concern itself with societal mechanisms for holding these market forces accountable. Indeed, this approach is now an important part of the public health lexicon for preventing smoking. No program of primordial prevention of smoking could possibly ignore the national and international economic interests of the tobacco industry. We need to start thinking about primordial prevention of CVD risk factors such as low physical activity, high-fat diet, and psychosocial stress in the same way.** © 1999 American Health Foundation and Academic Press

**Key Words:** CVD risk; socioeconomic status; market forces; health accountability.

## INTRODUCTION

It is widely recognized that socioeconomic factors<sup>3</sup> are intimately involved in the genesis, progression, treatment, and outcome of most diseases [1-4]. A large body of literature demonstrates that the cardiovascular

diseases (CVD) are no exception [5]. The recent *Chartbook on U.S. National Data on Socioeconomic Status and Cardiovascular Health and Disease* provides ample data documenting these associations in the United States, and the pattern is similar throughout the developed world [6]. Recently, through advances in imaging technology, it has become possible to demonstrate that socioeconomic factors even influence the very progression of early atherosclerotic vascular disease [7].

Thus, there can be no doubting the connection between "wealth and health." However, our understanding of the reasons for the relationship between socioeconomic measures and CVD strikes at the heart of what we mean by "understanding." A series of findings, most notably those of the Whitehall Study [8], indicated that the relationship between social class, measured by occupational grade among British civil servants, and cardiovascular morbidity and mortality could not be easily explained by traditional cardiovascular risk factors. These have been puzzling findings because it is not obvious what the important omitted pathways might be. However, in more recent studies we have shown [9] that the inverse association between income and the risk of cardiovascular death can be almost completely explained by an inverse association between adverse levels of a wide range of behavioral, social, psychological, and biologic risk factors and income.

Such findings, as interesting as they are, get at only part of the problem of explaining the association between socioeconomic position and CVD. They explain "how" the relationship works, for example, through adverse levels of various risk factors, but not "why" those risk factors are differentially distributed by socioeconomic status. Why are low socioeconomic status groups more likely to smoke and eat less nutritious diets and less likely to engage in regular physical activity? It is of course possible to posit that there is something intrinsically different about the people who occupy

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<sup>3</sup> In this paper we move back and forth between the terms socioeconomic factors, socioeconomic measures, socioeconomic status, socioeconomic position, social class, and income. We do not mean to imply that they are identical as they have different historical and conceptual roots and may differ in their relevance to population and individual health status. However, for the sake of the arguments being made here, these distinctions are not critical.



lower socioeconomic positions that results in these different patterns of risk factors, but there is very little evidence to support such a view. Furthermore, the pattern relating CVD and socioeconomic position is so consistent across place and time in developed countries that it demands some broader explanation.

We would submit that the question of why socioeconomic position influences the distribution of risk factors within populations is at the heart of advancing the primordial prevention of CVD. Elimination of socioeconomic gradients in CVD is attractive from an equity position alone, and the savings to the entire population which would come from even bringing CVD rates among the poor to the level of those of the middle class would be enormous. However, without an understanding of why cardiovascular risk factors are patterned by socioeconomic level, we cannot hope for such events. We will use two illustrations to show how consideration of socioeconomic factors is fundamental to the primordial prevention of CVD.

*Example 1: Macroeconomic Factors, Stress, Diet, and CVD*

While not examined nearly enough in the literature, we believe that attention to macroeconomic forces in society may shed some light on these issues, both nationally and internationally. Increasingly, macroeconomic factors are being considered important determinants of the population's health [10-14]. For example, Kaplan *et al.* [10] showed that differences between the states in age- and income-adjusted mortality, and other health outcomes, were strongly associated with the equity with which income was distributed in those states. Figure 1 shows the results for cardiovascular mortality. There was a strong and significant correlation ( $r = -0.56$ ,  $P < 0.0001$ ) between the proportion of total household income received by the least well-off 50% of the population in each state and the age-adjusted rates of cardiovascular mortality. Importantly, this association was independent of variations in state median incomes. We also demonstrated that states with higher levels of income inequality had significantly higher rates of smoking and sedentary behavior. The issue of income inequality is an important one because it is possible that the factors which generate the inequitable distribution of income have an impact on the rates of cardiovascular disease via increases in atherogenic risk factors, within and between countries (Fig. 2). While this figure represents what might be called evidence-based speculation, it illustrates how macroeconomic factors could be important in both primordial and primary prevention of CVD. During the past 15-20 years there has been increasing globalization of the economy resulting in greater concentration of capital in fewer hands and a set of society-wrenching consequences that

have been extensively documented in the popular and scientific press (e.g., in the United States—leveraged buyouts, downsizing, and changes in the occupational structure). Average weekly earnings of nonagricultural workers fell 12.2% between 1979 and 1994, there were large increases in part-time and temporary work, often with no benefits, and some evidence suggests an increase in hours worked and nonoverlapping work schedules in two-wage-earner families. The impact of these changes is felt disproportionately by some, with financial assets varying strikingly by race and ethnicity [15]. All of this translates into increasing inequality in the distribution of income with widening gaps between the rich and poor. In fact, Wolff [16] proclaimed that between the late 1970s and 1989, the United States had surpassed the "class-ridden" societies of Europe to emerge as the most inequitable in terms of its income distribution.

How macroeconomic changes affect health and risk factors for disease has not been well-studied, but it is reasonable to posit that these economic changes have important influences on our daily lives. One consequence of increased income inequality is that families have to operate with less real income. Some economists have argued that one response to this has been that not only do both adults in a household now work longer hours, but that they may even take on two or three jobs to try to meet expenses. This strategy to make "ends meet" may be even more important to low-income groups, where the premium on skill returns has not increased over time as it has for certain sectors of the economy such as those trained in high technology fields. It does not take too much imagination to speculate on how the increased demands of work might influence such things as eating habits, overweight, or physical activity. In fact, recent reports show that levels of physical activity in the United States have plateaued in recent years and rates of obesity are actually increasing despite the continued efforts of many public health agencies to improve diet and increase exercise levels in the population [17,18].

While the data are not conclusive, changes in the nature of work brought on by macroeconomic forces could be partly responsible for increased fast food consumption. In fact, more than 40% of the U.S. population eats out at least once per day; fast food restaurants account for more than 1/3 of all meals eaten out and 10-15% of all meat consumed in the United States, with McDonald's alone accounting for approximately 1% of the wholesale beef purchases [19]. Given the high fat content of most of these meals, the impact on the development of cardiovascular disease could be significant.

We must also keep in mind that in a global economy, increased consumption of beef in the United States may not only influence cardiovascular risk factors in this

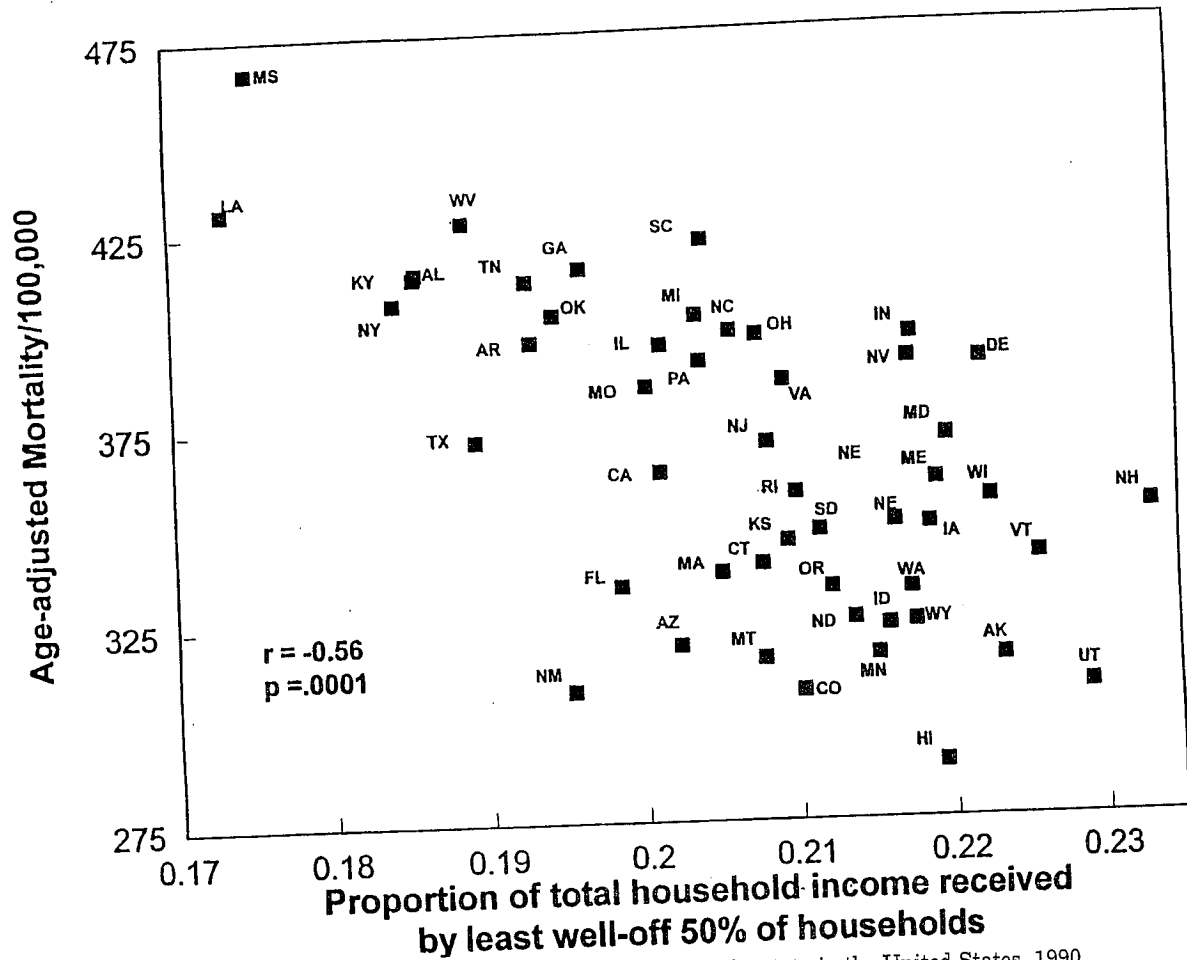


FIG. 1. Income inequality and cardiovascular mortality by state in the United States, 1990.

population. Where does this beef come from? While much is produced domestically, there have been substantial increases in importation of beef from Latin America. This is an interesting example of macroeconomic factors and increasing markets in one country having a potential influence on the disease pattern in other countries. The same macroeconomic factors discussed previously have led to major developments in Latin America. Fueled by Swift, International Food, Borden, United Brands, Cargill, W. R. Grace, and others, there have been enormous changes in agriculture in those countries. Since 1960, more than 25% of Central American forests have been cut for cattle grazing [19]. In Costa Rica alone, 80% of the forests have been cleared during the past 20 years [20], and approximately 1/3 of the beef produced in this cleared land in countries such as Honduras and Guatemala is shipped to the United States.

While this beef might be fueling fat consumption in the United States, it also may be contributing to moving countries toward the epidemic pattern of cardiovascular

disease that has been so common in industrialized countries. Aside from the possible global environmental effects linked to deforestation, the pattern of land clearing and centralization of land ownership which is taking place in Central and South America has other potentially negative effects. The substantial destruction of small, sustainable agriculture carried on by peasant populations is not accompanied by economically viable cattle ranches. In fact, 90% of the new cattle ranches go out of business within 8 years, leaving a soil base depleted from overgrazing [21]. In addition, there is some evidence that a good portion of the trees which are cut down to clear land for grazing are used as fuel in the flue-curing of tobacco, thereby increasing supplies of a major risk factor for CVD [22].

This pattern of disruption of rural populations is often accompanied by migration to urban areas, often leading to decreases in social cohesion and increases in social stress. Migration from villages to towns appears to be accompanied by the development of a pattern of age-related increases in blood pressure [23,24]. We know little about the long-term effects of these changes.

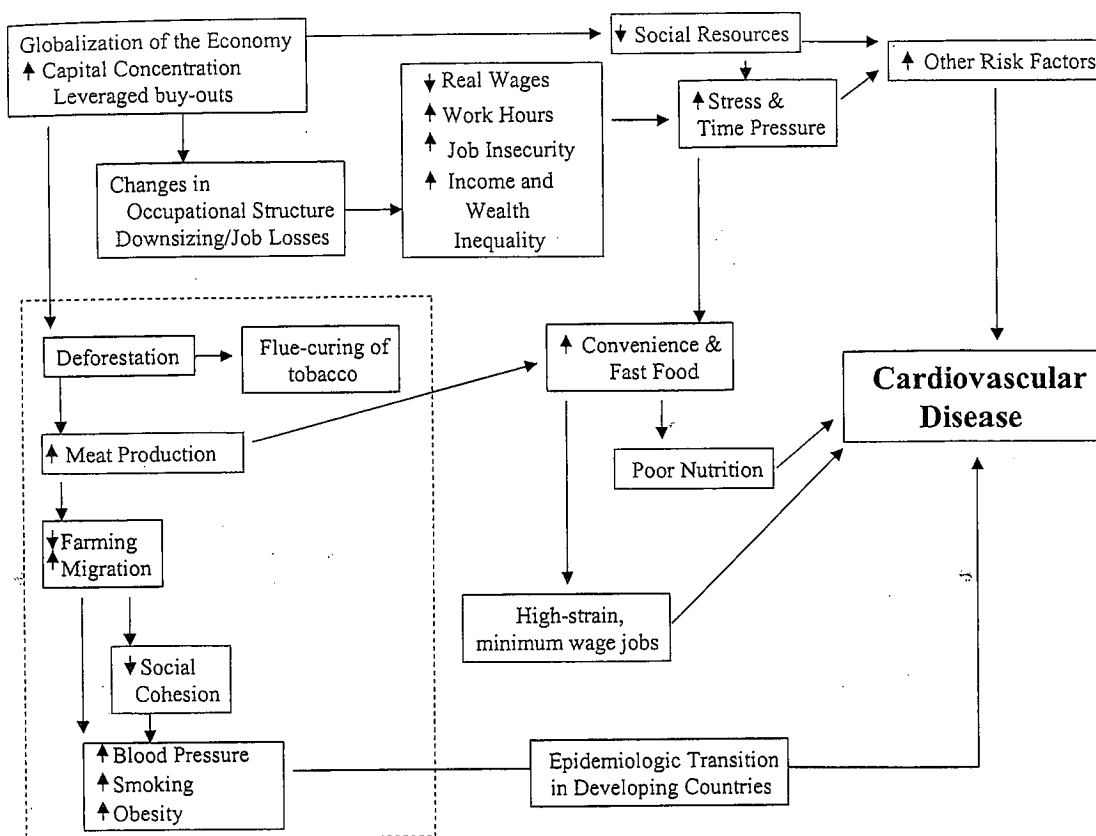


FIG. 2. Example of impact of macroeconomic factors on primordial and primary prevention.

However, a plausible hypothesis is that this disruption in traditional social patterns is accompanied by increases in CVD risk factors. Thus, macroeconomic factors become part of the driving force moving populations through the epidemiologic transition to high rates of chronic degenerative diseases, particularly CVD.

*Example 2: From the Sacred to the Profane—Macroeconomic Forces, Smoking, and CVD*

Two facts stand out in most modern industrialized societies—smoking is a major cause of CVD and its prevalence is inversely correlated with socioeconomic position. But the latter fact has not always been the case, as smoking was at one time more prevalent among the wealthy. From the viewpoint of primordial prevention it is instructive to examine how this state of affairs evolved.

The evolution of the tobacco habit can easily be subtitled from the “sacred to the profane” (Fig. 3). Before Europeans arrived in the Americas, tobacco was primarily used for shamanistic purposes, the natives considering it a sacred plant. (This historical discussion is summarized from PAHO, 1992) [25]. The spiritual benefits of tobacco were not universally appreciated. In 1604, King James, calling tobacco a “loathsome practice

with no medicinal value,” instituted a 400% tariff on the importation of tobacco. However, as it was primarily used by the wealthy, the tariff had little effect. The next 280 years saw the ascendancy of tobacco as a cash crop. Between 1620 and 1699 there was a 45-fold increase in exports to the United Kingdom, and by the late 17th century, tobacco had become the most important cash crop of the colonies.

Thus, tobacco was moving on its way from a ritualistic substance used by a few to mass consumption. As tobacco curing was developed and cigarettes became more popular, the number of manufacturers increased, and there were the first attempts at developing brand loyalty with various techniques including the use of trading cards and aggressive marketing—the beginnings of mass marketing. In the early to 1880s, one event proved pivotal in making cigarettes available for mass consumption. James Bonsack, with financial aid from James Duke, developed a machine that could manufacture 200 cigarettes per minute. Cost to the consumer was cut 50%, and production increased from 9 million to 60 million between 1885 and 1887.

With the establishment of cigarette smoking as the main form of tobacco consumption and the ability to produce large amounts of cigarettes, the way was paved

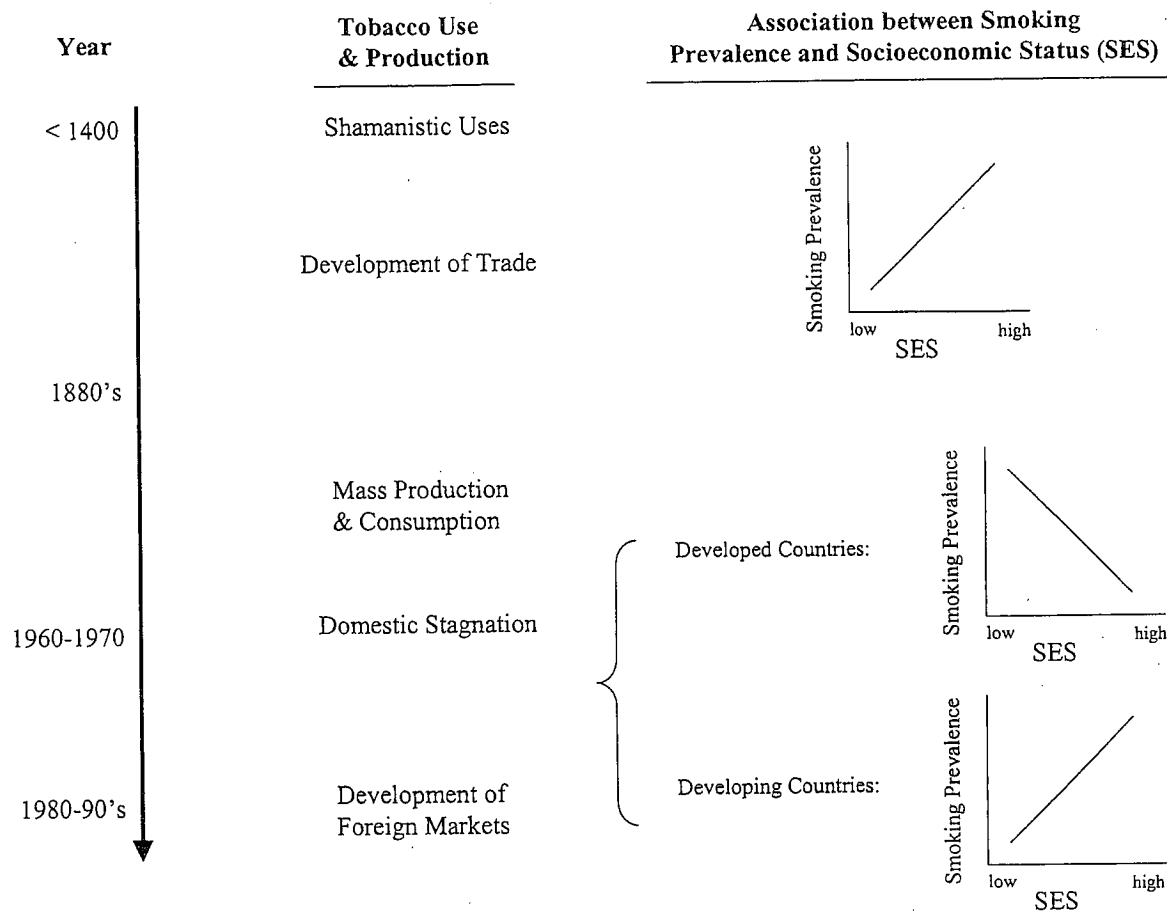


FIG. 3. From the sacred to the profane—historical changes in the association between socioeconomic status and smoking prevalence.

for the growth of large transnational tobacco corporations in the United States and the United Kingdom. From the 1920s to the 1950s there was a sixfold increase in per capita consumption, with consumption in the United States peaking in 1963. It is at this point that the SES gradient in smoking reverses, with the poor now having higher rates of consumption. In short, the present situation in which there is an inverse gradient between smoking, a powerful CVD risk factor, and socioeconomic position can only be understood by reference to the combination of new technology fueled by entrepreneurs and the mass and niche marketing which this technology enabled.

The combination of improved technologies to mass produce cigarettes, saturation of the market, and the development of health concerns led the tobacco companies to increase their international operations, with a major impact on developing countries. The result of this is increased consumption of tobacco in the developing world. In fact, increased consumption in the developing world accounted for all the worldwide increase between 1975 and 1995 [26]. Tobacco now provides a major source of revenue for many of these countries. In fact, it is estimated that 10% of the total tax revenues in

China come from tobacco products. With high proportions of the national budget being fueled by tobacco tax revenues, with increasing per capita income in many developing countries, and the aggressive marketing of cigarettes as a part of a desirable, modern lifestyle it should not be long before the pattern of high smoking rates among the poor is replicated in these countries.

#### CONCLUSION

Using two examples, we have tried to illustrate how understanding the etiology of CVD within and across populations requires an upstream approach which pays attention to the political economy of CVD risk factors. We would assert that it may be impossible to understand past or future trends in CVD without a consideration of these macroeconomic determinants. These examples also illustrate how economic events in one country may have an impact on trends in CVD and its risk factors in another country.

Given the importance of such upstream approaches, it is tempting for public health professionals to throw up their hands in despair as these are not issues that

they feel equipped to attack. However, there are a number of ways in which public health professionals can approach these large, upstream forces. For one, it is important to further elaborate the causal pathways that link upstream social and economic policies to the emergence of CVD risk factors and secular trends in the prevalence and distribution of these risk factors. Careful analysis of historical trends, natural experiments in which social and economic policies are changed, and of geographic patterns, within and between countries and regions, in risk factor use and trends can do much to increase the empirical base for such an approach. Second, it is important to aggressively pursue the dissemination of such information. While the mindset is often that proximal and individual solutions are preferred, the evidence from successful tobacco control efforts indicates that policy makers and the public will accept more upstream measures such as those related to pricing and environmental controls and that they have an effect. Finally, public health professionals need to make their voices heard when it seems likely that an upstream social or economic intervention is likely to have an impact on CVD risk factors. In many cases the reasoning behind the concerns over the health impact of policy changes is as well-founded as that used to support the policies, but if the voice of public health is not raised in response to such concerns it cannot be heard.

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