There is abundant evidence that cardiovascular disease is strongly patterned by socioeconomic position. Contrary to the stereotypical image of the wealthy but stressed executive who dies of a heart attack, people in the lowest socioeconomic strata, whether defined by income, education, or occupation, are consistently at greater risk of cardiovascular disease, at least in industrialized countries. Interestingly, the increased risk is not limited to the very poor but appears to decrease in quite a remarkable graded fashion, as socioeconomic resources increase. This graded relationship, which is observed for virtually all indicators of socioeconomic position, is striking given the crudeness with which social factors are usually measured in epidemiological and clinical studies, and the fact that these factors are necessarily very distal to the biological processes that lead to the development of atherosclerosis and the precipitation of clinical events. The strength and persistence of these patterns suggest a pervasive influence of social context on the body and on the cardiovascular system in particular. However, like many things that we are used to seeing over and over again, with time they become invisible and their significance is forgotten.

The opinions expressed in this article are not necessarily those of the editors or of the American Heart Association.

From the Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor.

Reprints requests to Ana V. Diez Roux, MD, PhD, Department of Epidemiology, University of Michigan, 1214 South University, 2nd Floor, Ann Arbor, MI 48103. E-mail adiezrou@umich.edu

(Circulation. 2005;111:3020-3021.)

© 2005 American Heart Association, Inc.

Circulation is available at http://www.circulationaha.org
DOI: 10.1161/CIRCULATIONAHA.105.542845
Table 3 of the Tonne et al article) begs the question of why these differences arose in the first place. Thus, the question shifts from “Is there any difference after we control for risk factors?” to “Are the risk factors we know about also patterned by socioeconomic position?” and “What processes explain this socioeconomic patterning?” In the case of the data reported by Tonne et al, why is it that AMI cases from disadvantaged neighborhoods are more likely to present with congestive heart failure and have a history of diabetes and previous AMI? What other risk factors for post-AMI mortality are associated with socioeconomic position and why are they patterned in this way?

The traditional indicator of socioeconomic position used in epidemiological studies has been education, and to many clinical researchers this remains the only socioeconomic indicator they even consider. The correlates of education may be different in different populations, as clearly demonstrated by striking differences in income and wealth between US whites and blacks of similar educational levels.6 Other person-level indicators such as income and occupation provide distinct and complementary information to education. Many different dimensions of social conditions may affect cardiovascular health. In recent years, features of the broader environmental contexts where people live and work, such as neighborhoods, have received increased attention.7 It has been hypothesized that physical and social characteristics of residential areas may be related to cardiovascular risk through multiple mechanisms. If relevant features of residential contexts are identified they could provide useful avenues for public health intervention.

Tonne et al use a neighborhood-level measure of socioeconomic position in their analyses, and show that neighborhood deprivation is associated with poorer survival after an MI. As the authors note, the absence of person-level information on socioeconomic indicators in their study makes it impossible to determine whether these differences across neighborhoods result from the features of the neighborhoods or to the socioeconomic characteristics of the people who live in them. Isolating the effects of neighborhood environments on survival after AMI will require data different from that available to Tonne et al. A key challenge in understanding neighborhood effects on cardiovascular risk is the development and testing of hypotheses about the specific features of neighborhood that may be relevant. This will require moving beyond aggregate socioeconomic characteristics of neighborhoods to the measurement of specific health-enhancing or health-damaging features. Tonne et al speculate on what some of the possible mechanisms linking neighborhoods to post-AMI mortality might be, but they do not have measures of these constructs. The measurement of neighborhood attributes is post-AMI mortality might be, but they do not have measures of these constructs. The measurement of neighborhood attributes is.

Recent enthusiasm regarding the possibility of identifying the genes that play a role in cardiovascular disease further highlights the need to measure the socioenvironmental factors with which genes will undoubtedly interact. In the presence of gene–environment interaction, adequate socioenvironmental assessment may turn out to be a sine qua non for the identification of genetic effects.8 Thus, more sophisticated socioenvironmental measurement is likely to be a requisite for complete scientific understanding of the biological processes leading to cardiovascular disease. Perhaps more important, even if the genetic determinants can be fully elucidated, intervening at the level of the environment may turn out to be the most effective prevention strategy among those genetically predisposed to the disease.

It is sometimes argued that only factors that are modifiable should be thought of as “causes.”9 Regardless of whether one agrees with this definition of a cause, modifiability is a requisite for interventions on that factor to be feasible. Surely then, social conditions, which are after all of our own making, are as valid as modifiable causes of cardiovascular disease as are genetic and biological attributes. It is true that intervening on more proximal factors through medical treatments or procedures may sometimes ameliorate the deleterious consequences of adverse social circumstances. Evidence suggests, however, that striking social gradients persist even in the presence of universal health care.10 This may be because access to care and the quality of that care are not necessarily equal even in the presence of (apparent) universal access. It is also because social conditions affect health through multiple mechanisms, and blocking just one of the pathways may have only a small impact on the gradient. Tonne et al demonstrate that poverty is associated with poorer survival after an AMI. To many this will not be news, but it is in understanding and changing the familiar that the greatest challenge often lies.

References
Persistent Social Patterning of Cardiovascular Risk: Rethinking the Familiar
Ana V. Diez Roux

Circulation. 2005;111:3020-3021
doi: 10.1161/CIRCULATIONAHA.105.542845
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2005 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/111/23/3020

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org/subscriptions/