Unmet Potential for Cardiovascular Disease Prevention in the United States

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In this issue of Circulation, Ford et al 1 report trends in the prevalence of a low–cardiovascular-risk profile in US adults over ~30 years based on data from the National Health and Nutrition Examination Surveys. Low risk was defined as the absence of cigarette smoking, hypertension, hypercholesterolemia, overweight, and diabetes mellitus. These authors show that the prevalence of a low-risk profile increased in the 1970s and 1980s (reflecting decreases in smoking, hypercholesterolemia, and hypertension) but decreased between 1988 to 1994 and 1999 to 2004 because of a greater prevalence of overweight, hypertension, and diabetes mellitus. The authors previously described reasons for the large decline in cardiovascular mortality between 1980 and 2000, including improvements in medical treatment and reductions in the population prevalence of cardiovascular risk factors. 2 They estimated that the decline in coronary heart disease mortality between 1980 and 2000 resulting from reductions in risk factors was 24% for total cholesterol, 20% for systolic blood pressure, and 12% for smoking. In contrast, greater prevalences of adiposity and diabetes mellitus increased cardiovascular mortality by an estimated 8% and 10%, respectively. The new data showing a reversal of the trend for the prevalence of the low-risk factor profile suggest that the decline in cardiovascular mortality may end, raising important questions about the future health and longevity of Americans.

More detailed analyses heighten concerns about trends in cardiovascular health within the United States. Using vital statistics data, Ford and Capewell 3 previously described that the age-adjusted coronary heart disease mortality declined from 1980 to 2002 by 52% in men and 49% in women. When distinguishing by age group, however, we see a continuous decline in older men and women (~55 years of age) up to 2002, whereas for younger men and women (35 to 55 years of age), a steep decline in the 1980s was followed by a more gradual decline in the 1990s and no decline between 2000 and 2002. In women 35 to 44 years of age, coronary heart disease mortality increased between 1997 and 2002. These disturbing trends among younger age groups have occurred in the presence of unprecedented availability of evidence-based medical therapies for coronary heart disease. However, the increasing prevalence of overweight, high blood pressure, and diabetes mellitus in US adults is consistent with a stagnation or reversal of the decline in cardiovascular mortality. Even more worrisome, these trends do not yet reflect the effects of the current epidemic of childhood obesity, which causes an early onset of type 2 diabetes, hypertension, and dyslipidemia. 4–6 Because the complications of diabetes mellitus increase strongly with duration, by 40 years of age, the affected children will have accrued several decades of exposure that will greatly elevate risks of not just coronary heart disease and stroke but also microvascular complications that can eventually lead to amputations, blindness, and kidney failure. Studies of body mass index at the end of childhood in relation to mortality provide insight into future premature mortality. We evaluated body mass index at 18 years of age in relation to mortality during 12 years of follow-up in US women 24 to 44 years of age at baseline. Compared with a body mass index of 18.5 to 21.9 kg/m², the hazard ratio for premature death was 1.66 (95% confidence interval, 1.31 to 2.10) for a body mass index of 25.0 to 29.9 kg/m² and 2.79 (95% confidence interval, 2.04 to 3.81) for a body mass index of ≥30 kg/m². 7 Similar results were obtained in a study of Swedish men who were on average 19 years of age at baseline and were followed up for 38 years. 8 These results suggest that the current epidemic of obesity in children will have a substantial impact on life expectancy in the coming decades. 9

In recent years, life expectancy already declined in many US counties, even though the national average is still increasing. Ezzati et al 10 described that between 1961 and 1983, no US county had a significant decrease in life expectancy, whereas between 1983 and 1999, life expectancy decreased significantly in 11 counties for men and 180 counties for women. These counties are clustered in low-income areas of the south and southeast United States and overlap with regions with high rates of obesity. Thus, national averages can be misleading because they can hide widening gaps in health among parts of the US population.

Although cardiovascular disease has long been and remains the major cause of death in the United States, massive evidence documents that the age-specific rates could be reduced dramatically to those of low-risk areas such as the Mediterranean region. For example, Stamler et al 11 studied the relation between low-risk status, defined as the absence of current cigarette smoking, hypertension, and hypercholesterolemia, and cardiovascular mortality in large US cohorts. The relative risks of cardiovascular mortality for low-risk persons...
compared with others ranged from 0.15 to 0.28, and the difference in life expectancy ranged from 5.8 to 9.5 years in different age-sex-cohort groups. Prospective cohort studies have also used an alternative definition of low risk based on lifestyle factors (nonsmoking, regular physical activity, high-quality diet) and avoiding overweight. In middle-aged US women followed up for 24 years, we recently estimated that 72% of cardiovascular mortality and 55% of all-cause mortality could have been avoided if all participants would have been in the low-risk category. These results indicate that a reduction of modifiable lifestyle risk factors for cardiovascular disease represents an enormous opportunity to improve population health.

Because excess adiposity is a major determinant of hypertension and type 2 diabetes mellitus, increasing adiposity is likely to be the major driver of the decreasing prevalence of the low-risk factor profile, and a control effort that does not address this underlying cause will have only limited success. Effective medication exists to lower blood pressure and low-density lipoprotein cholesterol levels, but medication will contribute only modestly to a reduction in population mortality rates because the other consequences of obesity, including diabetes mellitus, respiratory complications, and various types of cancer, are not addressed. In addition, only high-risk individuals are targeted with medication, and compliance is far from perfect. Evidence from multiple randomized controlled trials also shows that large reductions in low-density lipoprotein cholesterol, blood pressure, and risk of type 2 diabetes mellitus can be achieved by lifestyle changes, including higher intakes of fruits, vegetables, and whole grains; substitution of saturated and trans fat by cis-unsaturated fat; lower sodium intake; and regular physical activity. If applied to the total population, the potential for prevention and enhancement of overall health is enormous.

The disturbing trends in cardiovascular disease seem difficult to reconcile with the tremendous progress in medical knowledge and technologies and the fact that Americans spend >15% of their gross domestic product on health care. However, national efforts aimed at prevention and health promotion have received far less support. Part of the reason has been the political philosophy that healthy dietary and physical activity behaviors are solely choices of individuals, who should take responsibility for their own health. However, obesity was much less common in the United States 3 decades ago and varies widely between industrialized countries, suggesting a strong influence of environmental factors. This was supported directly in the Moving to Opportunity experiment, in which >4000 families living in high-poverty public housing projects in 5 US cities were randomized to receiving housing vouchers to move to more affluent neighborhoods or to a control group. Four to 7 years later, the experimental group had a statistically significant 5-percentage-point reduction in obesity prevalence compared with the control group. This was not a matter of individual choices but simply allocation to another environment by chance. In the context of the childhood obesity epidemic, the “individual responsibility” paradigm is particularly inappropriate. As a result of aggressive promotion of unhealthy beverages and foods and the elimination of opportunities for physical activity in schools and elsewhere, millions of Americans are starting their adult lives with obesity and the elevated risk of morbidity and premature mortality associated with this condition.

The population risk factor reduction approach takes full advantage of the potential for cardiovascular disease prevention. Rather than the traditional high-risk medical approach of identifying and treating high-risk individuals, it aims to prevent or reduce levels of risk factors in the entire population. Although these are not mutually exclusive approaches, with the high-risk strategy, a large potential for preventing disease goes unused because the many persons in the intermediate-risk category are not targeted. For obesity, a population approach may be not only the ideal strategy for reducing disease risk but also probably the more realistic. First, although modest weight loss is clearly beneficial for health, it is difficult for persons with obesity to achieve large long-term weight reductions, and prevention of overweight and obesity starting in childhood may be easier to achieve. Second, it is difficult for persons who are identified as high risk to adhere to improvements in diet and physical activity as individuals in an environment that does not support these behaviors. People often eat together with friends, family, and colleagues and engage in activity with others. In addition, healthful foods and opportunities for physical activity will be less available and more expensive if the demand for them is low. Third, the high-risk approach requires that persons adopt lifestyle behaviors because they are motivated to improve their health. In reality, other determinants of eating behaviors (eg, taste, price, availability), leisure physical activity (eg, pleasure, social interaction), and transportation options (eg, convenience) may be more important. For example, people are likely to bicycle more in the Netherlands than in the United States because of the ubiquitous and safe bicycle paths, to walk more in New York City than in Los Angeles because more destinations are within walkable distances, and to eat smaller portions in Japan and France compared with the United States because these cultures value presentation and quality above quantity of food. Although health messages are important, they will be more effective in the presence of a physical and social environment that supports healthy behaviors and when exposure to aggressive promotion of unhealthy foods is limited. We have also learned from the successes in reducing cigarette smoking that tax policies to promote healthy behaviors can be very successful, but we have yet to use them for beverages and foods to counter the pricing practices that favor unhealthy choices. Creating an environment that promotes health requires not only a high priority in health policy but also fundamental changes in agricultural, transportation, urban design, and educational policies. Much potential exists to reverse ominous trends in cardiovascular risk factors and mortality in the United States, but this is unlikely to occur without making prevention of overweight and obesity a clear national priority.

The findings of Ford et al provide an important signal that the health of Americans is at a crossroad. The current path leads toward increasing adiposity, diabetes mellitus, cardio-
vascular disease, and disability and an unfit, socially isolated population stuffed with pills and subjected to frequent palliative procedures. Medical costs will continue to burgeon and displace investments in education, parks, and other public infrastructure. An alternative scenario is possible if we take every opportunity to support optimal nutrition and physical activities of our children and to create an environment that encourages healthy options throughout life. The result will be not just lower rates of disease and medical costs but also enhanced physical and mental well-being. Physicians can contribute to this effort by working with their patients one on one. However, as has been done in the largely successful campaign against smoking, their help is needed even more as leaders in the effort to reshape policies and our environment.

Disclosures

None.

References


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