Macroeconomics and Cardiovascular Risk Factors
The Same View Through a Different Lens?

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The major risk factors for cardiovascular diseases (CVDs) have been known for at least half a century from both observational and clinical trial study designs. Despite advances in many countries, progress in prevention has been slow from a global perspective. The INTERHEART study and many epidemiological studies have shown that the vast majority of CVD can be explained by common risk factors, including hypercholesterolemia, hypertension, diabetes mellitus, and smoking. The Global Burden of Disease (GBD) study has led to a seismic shift in conceptualizing the burden of diseases and risk factors across countries and regions and has shown that the Western affluence model may be flawed when considering CVDs in low-income settings, where a dual burden of communicable and noncommunicable diseases exists. Data exist at many levels in many forms, and the message of growing burden of risk factors and resultant disease is undeniable. Researchers and clinicians alike strive for better data, better study designs, and better analytic methods to improve our knowledge of the causation and prevention of CVD, which will, in turn, allow us to plan the most effective strategies. However, readers are forgiven for concluding that sufficient data already exist and that it is time for action.

Article see p 1493

In reality, science alone rarely changes hearts and minds; such change requiresmultisectoral action with buy in from multiple stakeholders, including policy makers. The United Nations High Level Meeting for Non-Communicable Diseases in September 2011 focused the world’s attention on the sheer scale of the global burden of CVDs. In the last decade, cardiovascular science, particularly epidemiology, has increasingly reflected different views of CVD, its causes and its effects, to move from describing associations to guiding the road to action. In this respect, studies of time trends in risk factors and disease outcomes continue to be instructive, whether at the national or international level. For example, the IMPACT model has been used to explain epidemiological transitions in CVD in several countries by retrospectively analyzing time trends and establishing the attributable impact of changes in risk factors. Such analyses have highlighted that changes in risk factors, including diet, can have relatively quick effects on disease trends, contrary to popular belief, and may guide policy makers in the prioritization of risk factors and policies.

In this issue of Circulation, Ezzati and colleagues perform a novel, population-level analysis across 199 countries for 4 metabolic risk factors (body mass index [BMI], fasting plasma glucose, systolic blood pressure, and serum total cholesterol) in relation to the degree of social (by urbanization and Western diet) and economic (assessed by gross domestic product) development between 1980 and 2008. At the global and cross-country levels, research, including the GBD study and prior data from Ezzati and colleagues, has generally demonstrated overall increasing levels of burden of diabetes mellitus, obesity, and hypertension but with significant variations across risk factors and country-level income. In the present study, published and unpublished health examination surveys and population-based epidemiological studies were used to collate as much data as possible on the distribution of risk factors across countries. Importantly, countries were not weighted because this analysis was focused on intercountry variation rather than burden of disease.

At the country level, systolic blood pressure, total cholesterol, and BMI were positively associated with gross domestic product and Western diet in 1980, whereas only total cholesterol remained positively associated with gross domestic product in 2008. During the same time period, BMI remained positively associated with urbanization in both men and women, and fasting plasma glucose was strongly associated with BMI. The authors suggest that the latter finding may be due to an effect of urbanization on BMI beyond income and Western diet and project a rising global burden of hyperglycemia and diabetes mellitus, as well as increasing levels of hypertension, in low-income countries.

The authors are to be congratulated on the first data set of its kind. However, one of the most striking features is the paucity of global data. Across 199 countries, there were 960 data sources for BMI (17% of all country-years, counting each source as 1 country-year), 786 (14%) for systolic blood pressure, 321 (5.5%) for total cholesterol, and 370 (6.5%) for fasting plasma glucose. In fact, for BMI, 15% of countries had no data; for total cholesterol, >50%. The authors use standard imputation techniques to model missing data, but such a high degree of missing data limits the findings of the observations. In addition, the inadequacy of global surveillance data for CVD risk factors is highlighted. Of note, only Japan has an annual health examination survey. A high proportion of data on diet and cholesterol were missing, and the only complete data set was gross domestic product, which is a strong comment on the relative importance to
our governments of economic versus health information. Although the authors use standard techniques for the collation of dietary data, the principal component analysis method does not necessarily equate to a Western diet. Again, national collection of such survey data is patchy at best. Moreover, information on national smoking patterns, which are crucial in understanding disease and risk factors trends, is not available. Finally, more holistic markers than gross domestic product such as the Human Development Index would better quantify development at the country level.

Regardless of limitations, these data and future analyses will help in describing the associations between global macroeconomic changes and contemporaneous population-level risk factor distribution for CVD, especially because health-related analyses by national income have often focused on life expectancy and mortality and not on risk factors. Despite a call for “a quantitative, scientific framework to guide healthcare scale-up in developing countries,” the scale-up of noncommunicable disease prevention and treatment programs is hampered by lack of measurable targets and disagreement on the policies and interventions required, which in turn are often caused by lack of compelling data. The need for continuing research and continuing engagement with policy makers is highlighted by the fact that the United Nations High Level Meeting for Non-Communicable Diseases yielded disappointingly few “hard” targets for noncommunicable diseases.

Improved surveillance systems for CVD and its risk factors are urgently required, and the benefits of data linkage across economic, macroeconomic, and health spheres are clear. Global data relating risk factors for CVD to macroeconomics across countries will improve our understanding of the causes and consequences of CVD and may facilitate agreement on targets, policies, and interventions. Socioeconomic determinants are unquestionably linked to risk factors, incidence, and outcomes of CVD, whether studied at the local, regional, national, or international level. Inequalities in wealth and health are reciprocally related, and the greatest utility of the data presented by Ezzati and colleagues and future analyses probably lies in the galvanization of the body of evidence for CVD prevention as part of the longer-term agenda to improve global health inequities.

Disclosures

None.

References


Key Words: Editorsials | cardiovascular diseases | economics | growth and development | prevention and control | risk factors
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*Circulation.* 2013;127:1451-1452; originally published online March 12, 2013; doi: 10.1161/CIRCULATIONAHA.113.002002
*Circulation* is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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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/127/14/1451

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