

## Countries' economy, health-care system linked to cholesterol rates

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People with a history of high cholesterol who come from higher income countries or countries with lower out-of-pocket healthcare expenses, as well as those from countries with high performing healthcare systems, defined using World Health Organization (WHO) indices, tend to have lower subsequent cholesterol rates, according to new research in the American Heart Association journal *Circulation*.

"We found that patients living in [countries](#) in the highest third of gross national income or WHO [health system](#) achievement and performance/efficiency indices had a significantly lower likelihood of having elevated total cholesterol levels than patients from countries falling in the lower two-thirds," said Elizabeth A. Magnuson, Sc.D., lead author of the study and director of the [Health Economics](#) and Technology Assessment at Saint Luke's Mid America Heart Institute in Kansas City, Mo. "Patients from countries falling within the highest third of all countries studied for out-of-pocket health expenditures were more likely to have elevated total cholesterol than patients who had lower out-of-pocket costs."

Researchers studied a database of more than 53,000 patients at elevated risk of heart attack or stroke from 36 countries in North and Latin America, Western and Eastern Europe, the Middle East, Asia, Japan and Australia.

They focused on the proportion of patients with total cholesterol of more than 200 mg/dL and how it might be associated with several factors

including a country's gross national income, how well the health system functions, and the proportion of healthcare expenses that are paid for out-of-pocket. They found:

- Among the 38 percent of patients with high total [cholesterol levels](#), rates varied widely across countries, ranging from 73 percent in Bulgaria to 24 percent in Finland.
- Patients with a prior history of high cholesterol had higher rates than those newly diagnosed.
- Elevated cholesterol rates were particularly high among patients in Eastern European countries: Bulgaria, Lithuania, Romania, Ukraine, Hungary and Russia. These countries also ranked relatively low on health system and economic indicators.
- While the United States had rates of elevated cholesterol similar to other developed countries -- such as Finland, the U.K., Israel, Australia and Canada -- levels of healthcare spending was considerably higher than in other developed countries.
- For patients with a history of high cholesterol, country-specific rates of high total cholesterol tended to increase as country-level income and health system performance decreased.

For patients without a prior history of high cholesterol, the researchers found no associations between country-level economy and health system factors and the likelihood of elevated cholesterol.

"Optimal management of cardiovascular disease is complex, and country-level variation in rates of elevated cholesterol may be due to differences in clinical guidelines, as well as whether and the extent to which guidelines are followed and specific initiatives are effectively implemented," Magnuson said. "The association between high [cholesterol](#) and out-of-pocket healthcare expenses may reflect an inability or unwillingness for patients in countries with higher out-of-

pocket expenses to be compliant with prescribed medications. The recent availability of generic cholesterol-lowering therapy should make out-of-pocket expense less of a barrier."

For the study, researchers examined associations only; future studies should explore causal mechanisms or why these associations occur, Magnuson said. Furthermore, this study focused on [patients](#) with access to health care, and country-specific rates of [high cholesterol](#) may therefore be underestimated.

Provided by American Heart Association

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