Cardiovascular disease burden, deaths are rising around the world

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The number of people dying from cardiovascular disease (CVD) is steadily rising, including one-third of all deaths globally in 2019, according to a paper in the *Journal of the American College of Cardiology* that reviewed the total magnitude of CVD burden and trends over 30 years around the world. The data reflects an urgent need for

countries to establish cost-effective public health programs aimed at reducing cardiovascular risk through modifiable behaviors.

CVD, particularly ischemic heart disease and stroke, is the leading cause of death around the world and a huge contributor to disability and rising health care costs. The Global Burden of Diseases, Injuries, and Risk Factors Study 2019, from which this paper uses data, is a multinational collaboration that estimates global, regional and national disease burden as part of an ongoing effort to provide consistent and comparable estimates of health from 1990-2019. It uses all available population-level data sources on incidence, prevalence, case fatality, mortality and health risks to estimate measures of population health for 204 countries and territories.

In this paper, authors look at the specific impact of cardiovascular disease within the Global Burden of Diseases study to examine the extent to which population growth and aging and CVD risk factors explain the observed CVD trends, sex differences and regional patterns, as well as how the epidemiology of the disease is evolving.

"Global patterns of total CVD have significant implications for clinical practice and public health policy development," said Gregory A. Roth, MD, MPH, lead author of the paper and associate professor in the division of cardiology and adjunct associate professor at the Institute for Health Metrics and Evaluation at the University of Washington School of Medicine. "Prevalent cases of total CVD are likely to increase substantially as a result of population growth and aging, especially in Northern Africa and Western Asia, Central and Southern Asia, Latin America and the Caribbean, and Eastern and Southeastern Asia where the share of older persons is projected to double between 2019 and 2050. Increased attention to promoting ideal cardiovascular health and healthy aging across the lifespan is necessary. Equally important, the time has come to implement feasible and affordable strategies for the

prevention and control of CVD and to monitor results."

The paper includes 13 underlying causes of cardiovascular death and nine related risk factors. For each cause and risk factor, the authors identified which regions and countries have the highest and lowest prevalent cases and number of deaths, as well as summary measures including number of years of life lost (YLLs), number of years lived with disability (YLDs) and the amount and temporal trends in disability-adjusted life years (DALYs). The paper also addresses how the summary measures of each CVD and risk highlighted inform investments in cardiovascular research, their implications for clinical practice, and suggestions for health system development and national and regional policy.

Findings highlighted in the paper showed the prevalent cases of total CVD nearly doubled from 271 million in 1990 to 523 million in 2019, while the number of CVD deaths steadily increased from 12.1 million in 1990 to 18.6 million in 2019. In 2019, the majority of CVD deaths globally were ischemic heart disease and stroke, increasingly steadily from 1990. The global trends for DALYs and YLLs also increased significantly while YLDs doubled from 17.7 in 1990 to 34.4 million in 2019.

In 2019, CVD was the underlying cause of 9.6 million deaths among men and 8.9 million deaths among women, around a third of all deaths globally. Over 6 million of these deaths occurred in people between the ages of 30-70. The highest number of CVD deaths occurred in China, followed by India, Russia, the US and Indonesia.

At the country level, age-standardized mortality rates for total CVD were lowest in France, Peru and Japan where rates were six-fold lower in 2019 than in 1990. The authors of the paper note that from 1990 to 2019, large declines in the age-standardized rates of death, DALYs and

YLLs together with small incremental reductions in age-standardized rates for prevalent cases, and YLDs suggest that population growth and aging are big contributors to the increase in total CVD.

The paper also discusses challenges in prevention and treatment of CVD and risks globally.

"There remains a large gap between what we know about CVD and risk factors and what we do in their prevention, treatment and control worldwide," said George A. Mensah, MD, co-lead author of the paper and director of the Center for Translation Research and Implementation Science at the National Heart, Lung, and Blood Institute, part of the National Institutes of Health. "The Global Burden of Diseases study continues to be a platform that allows tracking and benchmarking of progress in the reduction of CVD and risk factor burden. However, renewed focus is needed now on affordable, widely available and proven-effective implementation strategies for the prevention, treatment and control of CVD and risk factors and the promotion of ideal cardiovascular health beginning in childhood."

Amid the current COVID-19 pandemic, there exists high rates of excess mortality and according to the paper, much of this additional disease burden may be CVD because of the effects of both viral infection and changes in the delivery of health care and health-seeking behaviors due to pandemic mitigation efforts. However, further research in this area is vitally needed.

"There is a pressing need to focus on implementing existing cost-effective interventions and health policies if the world is to meet the targets for Sustainable Development Goal 3 and achieve at least a 30% reduction in premature mortality due to non-communicable disease by 2030," said Valentin Fuster, MD, Ph.D., senior author of the paper, Director of Mount Sinai Heart and Physician-in-Chief of The Mount

Sinai Hospital. "In the face of a global viral pandemic, we still must emphasize global commitments to reduce the suffering and premature death caused by CVD, which limits healthy and sustainable development for every country in the world."

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