

Association of Symptoms of Depression With Cardiovascular Disease and Mortality in Low-, Middle-, and High-Income Countries

Selina Rajan, MSc; Martin McKee, DSc; Sumathy Ranganathan, MSc; Shrikant Bangdiwala, PhD; Annika Rosengren, MD; Rajeev Gupta, PhD; Vellappillil Ramon Kurty, MD; Andreas Wielgus, PhD; Scott Lear, PhD; Khalid F. AlHabib, MSc; Homer Li Co, MD; Patricia Lopez-Jaramillo, PhD; Alvaro Avezum, PhD; Pamela Saron, PhD; Aytelkin Oguz, MD; Isanthel M Kruger, PhD; Rafael Diaz, PhD; Mari-Nasir Nafes, MD; Jephth Chibumba, DPhil; Karen Yeates, MD; Roya Kelishadi, MD; Walela Mohammed Sharief, MSc; Andrzej Szczytko, PhD; Rasha Khutib, PhD; Omar Rahman, DSc; Roumana Iqbal, PhD; Hu Bo, MD; Zhu Yibing, MD; Li Wei, PhD; Salim Yusuf, DPhil, for the Prospective Urban Rural Epidemiology (PURE) Study Investigators

[+ Supplemental content](#)

IMPORTANCE Depression is associated with incidence of and premature death from cardiovascular disease (CVD) and cancer in high-income countries, but it is not known whether this is true in low- and middle-income countries and in urban areas, where most people with depression now live.

OBJECTIVE To identify any associations between depressive symptoms and incident CVD and all-cause mortality in countries at different levels of economic development and in urban and rural areas.

DESIGN, SETTING, AND PARTICIPANTS This multicenter, population-based cohort study was conducted between January 2005 and June 2019 (median follow-up, 9.3 years) and included 370 urban and 314 rural communities from 21 economically diverse countries on 5 continents. Eligible participants aged 35 to 70 years were enrolled. Analysis began February 2018 and ended September 2019.

EXPOSURES Four or more self-reported depressive symptoms from the Short-Form Composite International Diagnostic Interview.

MAIN RESULTS AND MEASURES Incident CVD, all-cause mortality, and a combined measure of either incident CVD or all-cause mortality.

RESULTS Of 145 862 participants, 61 235 (58%) were male and the mean (SD) age was 50.05 (9.7) years. Of those, 15 983 (11%) reported 4 or more depressive symptoms at baseline. Depression was associated with incident CVD (hazard ratio [HR], 1.14; 95% CI, 1.05-1.24), all-cause mortality (HR, 1.17; 95% CI, 1.11-1.25), the combined CVD/mortality outcome (HR, 1.18; 95% CI, 1.11-1.24), myocardial infarction (HR, 1.23; 95% CI, 1.10-1.37), and noncardiovascular death (HR, 1.21; 95% CI, 1.13-1.30) in multivariable models. The risk of the combined outcome increased progressively with number of symptoms, being highest in those with 7 symptoms (HR, 1.34; 95% CI, 1.12-1.57) and lowest with 1 symptom (HR, 1.05; 95% CI, 0.92-1.19; P for trend = .001). The associations between having 4 or more depressive symptoms and the combined outcome were similar in 7 different geographical regions and in countries at all economic levels but were stronger in urban (HR, 1.23; 95% CI, 1.13-1.34) compared with rural (HR, 1.10; 95% CI, 1.02-1.19) communities (P for interaction = .001) and in men (HR, 1.27; 95% CI, 1.13-1.38) compared with women (HR, 1.14; 95% CI, 1.06-1.23; P for interaction = .001).

CONCLUSIONS AND RELEVANCE In this large, population-based cohort study, adults with depressive symptoms were associated with having increased risk of incident CVD and mortality in economically diverse settings, especially in urban areas. Improving understanding and awareness of these physical health risks should be prioritized as part of a comprehensive strategy to reduce the burden of noncommunicable diseases worldwide.

Author Affiliations. Author affiliations are listed at the end of this article.

Group Information. The members of the Prospective Urban Rural Epidemiology (PURE) Study Investigators appear at the end of the article.

Corresponding Author: Selina Rajan, MSc, London School of Hygiene & Tropical Medicine, Bldg 15-17, Tavistock Place, London WC1H 9SH, United Kingdom (selina.rajan@lshtm.ac.uk).