

(2022). Micronutrient Supplementation to Reduce Cardiovascular Risk. *Journal of the American College of Cardiology*. 80. 2269–2285. 10.1016/j.jacc.2022.09.048. Background

Healthy dietary patterns are rich in micronutrients, but their influence on cardiovascular disease (CVD) risks has not been systematically quantified.

### Objectives

The goal of this study was to provide a comprehensive and most up-to-date evidence-based map that systematically quantifies the impact of micronutrients on CVD outcomes.

### Methods

This study comprised a systematic review and meta-analysis of randomized controlled intervention trials of micronutrients on CVD risk factors and clinical events.

### Results

A total of 884 randomized controlled intervention trials evaluating 27 types of micronutrients among 883,627 participants (4,895,544 person-years) were identified. Supplementation with n-3 fatty acid, n-6 fatty acid, l-arginine, l-citrulline, folic acid, vitamin D, magnesium, zinc,  $\alpha$ -lipoic acid, coenzyme Q10, melatonin, catechin, curcumin, flavanol, genistein, and quercetin showed moderate- to high-quality evidence for reducing CVD risk factors. Specifically, n-3 fatty acid supplementation decreased CVD mortality (relative risk [RR]: 0.93; 95% CI: 0.88–0.97), myocardial infarction (RR: 0.85; 95% CI: 0.78–0.92), and coronary heart disease events (RR: 0.86; 95% CI: 0.80–0.93). Folic acid supplementation decreased stroke risk (RR: 0.84; 95% CI: 0.72–0.97), and coenzyme Q10 supplementation decreased all-cause mortality events (RR: 0.68; 95% CI: 0.49–0.94). Vitamin C, vitamin D, vitamin E, and selenium showed no effect on CVD or type 2 diabetes risk.  $\beta$ -carotene supplementation increased all-cause mortality (RR: 1.10; 95% CI: 1.05–1.15), CVD mortality events (RR: 1.12; 95% CI: 1.06–1.18), and stroke risk (RR: 1.09; 95% CI: 1.01–1.17).

### Conclusions

Supplementation of some but not all micronutrients may benefit cardiometabolic health. This study highlights the importance of micronutrient diversity and the balance of benefits and risks to promote and maintain cardiovascular health in diverse populations. (Antioxidant Supplementation in the Prevention and Treatment of Cardiovascular Diseases; CRD42022315165)