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Cost-effectiveness of vitamin therapy to lower plasma homocysteine levels for the prevention of coronary heart disease effect of grain fortification and beyond.

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CONTEXT: A high homocysteine level has been identified as an independent modifiable risk factor for coronary heart disease (CHD) events and death. Since January 1998, the US Food and Drug Administration has required that all enriched grain products contain 140 microg of folic acid per 100 g, a level considered to decrease homocysteine levels. **OBJECTIVES:** To examine the potential effect of grain fortification with folic acid on CHD events and to estimate the cost-effectiveness of additional vitamin supplementation (folic acid and cyanocobalamin) for CHD prevention. **DESIGN AND SETTING:** Cost-effectiveness analysis using the Coronary Heart Disease Policy Model, validated, state-transition model of CHD events in adults aged 35 through 84 years. Data from the third National Health and Nutrition Examination Survey (NHANES III) were used to estimate age- and sex-specific differences in homocysteine levels. **INTERVENTION:** Hypothetical comparison between a diet that includes enriched grain products projected to increase folic acid intake by 100 microg/d with the same diet without folic acid fortification; and a comparison between vitamin therapy that consists of 1 mg of folic acid and 0.5 mg of cyanocobalamin and the diet that includes grains fortified with folic acid. **MAIN OUTCOME MEASURES:** Incidence of myocardial infarction and death from CHD, quality-adjusted life-years (QALYs) saved, and medical costs. **RESULTS:** Grain fortification with folic acid was predicted to decrease CHD events by 8% in women and 13% in men, with comparable reductions in CHD mortality. The model projected that, compared with grain fortification alone, treating all patients with known CHD with folic acid and cyanocobalamin over a 10-year period would result in 310 000 fewer deaths and lower costs. Over the same 10-year period, providing vitamin supplementation in addition to grain fortification to all men aged 45 years or

older without known CHD was projected to save more than 300 000 QALYs to save more than US \$2 billion, and to be the preferred strategy. For women without CHD, the preferred vitamin supplementation strategy would be to treat all women older than 55 years, a strategy projected to save more than 140 000 QALYs over 10 years. CONCLUSIONS: Folic acid and cyanocobalamin supplementation may be cost-effective among many population subgroups and could have a major epidemiologic benefit for primary and secondary prevention of CHD if ongoing clinical trials confirm that homocysteine-lowering therapy decreases CHD event rates.

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