

## Magnesium and calcium in drinking water and cardiovascular mortality

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Data on the hardness of drinking water were collected from 27 municipalities in Sweden where the drinking water quality had remained unchanged for more than 20 years. Analyses were made of the levels of lead, cadmium, calcium, and magnesium. These water-quality data were compared with the age-adjusted mortality rate from ischemic heart and cerebrovascular disease for the period 1969-1978. Lead and cadmium were not present in detectable amounts except in one water sample. A statistically significant inverse relationship was present between hardness and mortality from cardiovascular disease for both sexes. Mortality caused by ischemic heart disease was inversely related to the magnesium content, particularly for the men ( $P < 0.01$ ). The rather small set of data supports results from previous studies suggesting that a high magnesium level in drinking water reduces the risk for death from ischemic heart disease, especially among men, although the possible importance of confounding factors needs further evaluation. Key terms: cerebrovascular disease, ischemic heart disease, magnesium, water hardness.

Several epidemiologic investigations performed during recent decades have demonstrated an inverse relationship between water hardness and death from cardiovascular disease. The first observation was made in 1957 (1) and was subsequently elaborated upon in investigations in many other countries (2-4). A particularly relevant study was reported by Crawford et al (5), who followed the mortality rate in 11 English cities where the water hardness had changed between 1950 and 1960. Hardness had increased in five cities and decreased in six. Mortality from cardiovascular disease increased about 10% in the general population during the period of study. In the cities where hardness had decreased, mortality had increased by 20%....