Can calcium and magnesium (‘hardness’) in drinking water contribute to preventing disease? This book documents the outputs of an unprecedented group of experts assembled by the World Health Organization to address this question. It includes their comprehensive consensus view on what is known and what is not about the role and possible health benefit of calcium and magnesium in drinking-water. Also included is a series of chapters each authored by internationally renowned experts reviewing the state of the art in different aspects, including:

- global dietary calcium and magnesium intakes
- the contribution of drinking water to calcium and magnesium intake
- health significance of calcium and magnesium
- role of drinking-water in relation to bone metabolism
- epidemiological studies and the association of cardiovascular disease risks with water hardness and magnesium in particular
- water production, technical issues and economics.

In both developed and developing countries, typical diets are often deficient in calcium and magnesium, essential minerals which are necessary for the development of strong bones and teeth, and for cardiovascular function. At the same time, there is evidence that consuming ‘hard’ drinking-water may be associated with reduced risks for some diseases.

Climate change and other ongoing changes will increase the use of ‘high tech’ treatments - for example desalination and reclamation of polluted waters and mean that the issue will be of increasing future importance.
Contents

Chapter 1. Expert consensus
Meeting the Experts Report

Chapter 2. Overview of global dietary calcium and magnesium intakes and allowances
S.A. Atkinson, R. Costello and J.M. Donohue

Chapter 3. The mineral composition of water and its contribution to calcium and magnesium intake
C.N. Ong, A.C. Grandjean and R.P. Heaney

Chapter 4. Identifying magnesium deficiency: A diagnosis dilemma
R.J. Elin

Chapter 5. Magnesium deficiency: Clinical and experimental aspects
W.B. Weglicki

Chapter 6. Magnesium and hypertension
R.M. Touyz and B. Sontia

Chapter 7. Atherosclerosis and magnesium
B.M. Altura and B.T. Altura

Chapter 8. Health significance of calcium and magnesium: Examples from human studies
G.F. Combs, Jr and F.H. Nielsen

Chapter 9. Calcium and magnesium: Role of drinking-water in relation to bone metabolism
C.M. Weaver and J.W. Nieves

Chapter 10. Epidemiological studies and the association of cardiovascular disease risk with water hardness
R. Calderon and P. Hunter

Chapter 11. Alternative hypotheses and knowledge gaps
J.K. Fawell

Chapter 12. Water production, technical issues and economics
P. Regunathan

Glossary

Index