

Is there a protective effect of high mineral content in drinking water on coronary heart disease mortality? A cross-sectional ecological study of a large population in central England.

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It has been hypothesised that dissolved minerals in drinking water, particularly calcium carbonate and magnesium carbonate, are protective against atherosclerotic disease. Animal studies suggest a biologically plausible mechanism for this and correlations have been found in several large studies. However many of these studies compared populations which were geographically far apart and had regional and socio-economic attributes which may have confounded the results.

In the English Midlands there is a large and diverse population which, for reasons relating to local geology and the history of the supply network, has great variation in water hardness over a small area. This can be accurately mapped and linked to health and census geographies.

We used GIS techniques linking water company data to census data to identify small areas which were completely contained in areas of similar water hardness. We are examining 443 census geographies with combined population of over three million people. In these areas, as well as knowing the chemical composition of the water supply, we have reliable area-level data on mortality, demography, socio-economic deprivation and good estimates of the prevalence of smoking and obesity.

We are now building a negative binomial regression model which examines the relationship between coronary heart disease deaths, water hardness, socio-economic status, ethnicity, obesity and smoking prevalence in each one of our 443 neighbourhoods. This will enable us to adjust for important known risk factors and explore any interaction effects.

The project is currently in progress and we plan to present the results at the symposium.

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