Executive summary

This report covers a study into the prevalence of *M. avium* complex (MAC) and *M. avium var paratuberculosis* (MAP) in potable water in England undertaken by the Public Health Laboratory Service. A main driver for the study was concern that Crohn’s disease, an unpleasant chronic disease of the intestine, could be spread through drinking water. In brief the objectives of the study were to investigate and develop suitable methods for culturing MAP and MAC from water. In the second phase of the study these methods were used to culture MAP and MAC from various points in six water treatment and distribution systems in England, chosen to represent a range of sources and treatment conditions.

The isolation method developed for MAC involved addition of cetylpyridinium chloride (CPC) and Tween 80 followed by concentration by centrifugation. The resulting pellets were resuspended and inoculated onto Middlebrook 7H10 medium with cycloheximide and mycobactin J for culture. The isolation method for MAP involved addition of CPC followed by filtration, elution from the filter and final concentration by centrifugation. The resulting pellets were then resuspended and inoculated onto Herrold’s medium with and without mycobactin J. In addition each concentrate for MAP culture was inoculated into two bottles of liquid medium for the automated Organon Technika MB/BacT culture system. The Gen-Probe® Accuprobe® and Polymerase Chain Reaction Restriction Fragment Analysis confirmed presumptive positive cultures.

*Mycobacteria* spp. were isolated from of 19 of 170 water samples (11%) tested. Of these 3 were MAC (2 *M. avium* isolates, 1 *M. intracellulare* isolate). MAP was not isolated from any sample. These three MAC positive samples were isolated from the same water treatment and distribution system, once from raw water and twice from water in distribution. Mycobacteria were only isolated using the MB/BacT system and not from any of the solid media suggesting the numbers present were low.

Although *Mycobacterium* spp. were isolated too infrequently to draw definitive conclusions, it would appear that *Mycobacterium* spp. were more common in raw lowland river water and upland impounding reservoir water than in groundwater. Treated water samples had lower rates of contamination than raw water samples. The isolation rate was higher from treated water derived from lowland rivers than treated water derived from upland or groundwater sources and reflected the incidence in the source water. Because the number of samples positive for MAC was low, no statistically significant difference between sources and treatments was demonstrated.

The failure to detect MAP in any sample provides some assurance that public water supplies in England are not commonly contaminated with large numbers of MAP.