

TRICHALOMETHANE LEVELS IN RELATION TO RATES OF STILLBIRTH AND LOW BIRTH WEIGHT: AN INTERVENTION STUDY

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Background and aims: In the North West of England, water is supplied to 7 million people by the water company United Utilities. During 2003 and 2004, the company introduced enhanced coagulation (EC) to some treatment works, reducing DBP formation potential. This intervention provided a unique opportunity to study the effect of DBPs on birth outcomes, whilst reducing socioeconomic confounding. The aim was to compare the rates of stillbirth, low and very low birth weight three years before (2000-2002) the treatment changes with rates three years after (2005-2007).

Methods: Exposure metrics for EC and trihalomethane concentration change were created for each water zone. Births and stillbirths were extracted from the national birth registers and linked via postcode of maternal residence at birth to the water zone using geographical information systems. Differences in small-area rates of stillbirth, low and very low birth weight before and after treatment changes were modelled against change to enhanced coagulation and low, medium and high trihalomethane change (all water zones together and then stratified by EC) using Poisson regression. Differences between rate changes were tested using an interaction term between before/after and EC or trihalomethane change.

Results: Change to EC was not associated with a significant reduction in rates of the birth outcomes investigated. Areas with the greatest decrease in chloroform, compared with areas with lower chloroform decrease, showed a greater reduction in rates of stillbirth (non-significant), low birth weight (7 %, $p = 0.02$ areas without EC) and very low birth weight (20 %, $p = 0.02$ all water zones regardless of EC status).

Conclusion: Chloroform concentration appears to be associated with stillbirth, low birth weight and very low birth weight rates. Although the intervention design reduced potential confounding from deprivation, it is possible that factors related to ethnicity could explain some of the rate reductions.