

THE EFFECT OF WATER SOURCE AND TYPE OF DISINFECTION IN BIRTH DEFECTS IN MASSACHUSETTS

J. Michael Wright, *National Center for Exposure Assessment, Office of Research and Development, US Environmental Protection Agency, Cincinnati, OH*
Zorimar Rivera-Núñez, *National Research Council, Washington DC*

Background and Aims: Previous research suggests that exposure to different water source, disinfection type (e.g., chlorinated surface water), and disinfection by-products may be associated with birth defects (BDs). We assessed the potential risk of water source and disinfection type on BDs in Massachusetts.

Methods: Water source and disinfection data were collected from 275 Massachusetts towns. Birth data were obtained through birth certificates and the Massachusetts Birth Defects Monitoring Program. Logistic regression was used to examine the risk of BDs among 360,799 live births from 2000•2004.

Results: Towns obtained water from surface (65%), ground (25%) or mixed systems (10%), and disinfection treatments included chlorination (48%), chloramination (32%), and other disinfectants (i.e., UV, ozone, chlorine dioxide) (10%), while 10% of towns used water that was not disinfected. Based on 3,500 birth defects, preliminary unadjusted and adjusted (for age, race, education, tobacco use, prenatal care) results for all combined BDs were largely null among different water source and disinfection exposure measures. Although, not statistically significant, there was some suggestion of slightly increased risks for certain BD groups (i.e., cardiovascular system, genital system, urinary system). Compared to untreated ground water systems, the adjusted odds ratios (ORs) ranged from 1.17 to 1.37 for obstructive urinary defects among births linked to drinking water treated with chlorine, chloramines, and other disinfectants. Compared to untreated ground water, adjusted ORs for use of chlorinated and chloraminated water ranged from 1.08 to 1.14. Adjusted ORs ranged from 1.17 to 1.19 for hypospadias and epispadias among chlorinated surface water and chloraminated water users compared to untreated ground water.

Conclusions: Further analyses will include linkage with trihalomethane and haloacetic acid data and consideration of statistical modeling approaches.