

ILLNESSES ASSOCIATED WITH BATHING IN MARINE WATERS CONTAMINATED WITH DOMESTIC SEWAGE: THE RESULTS OF A RANDOMIZED TRIAL.

BACKGROUND: This study was designed to assess the health risks associated with bathing in marine waters contaminated with domestic sewage.

METHODS: Four randomized trials were conducted in the U.K. during 1989-1992. The relationship between exposure to waters contaminated with domestic sewage and subsequent risk of illness was assessed for the following: gastroenteritis, acute febrile respiratory illness (AFRI), ear, eye, and skin ailments. Bacteriological indices of water quality were assigned to individual bathers within 15 minutes of exposure and within 10 meters of the actual location of exposure. Extensive pre- and post-trial interviews were designed to assess the occurrence of the outcome illnesses, and to identify and control for non-water-related risk factors for these outcome illnesses.

RESULTS: 1,273 study participants were randomized into two groups: 608 bathers vs. 665 non-bathers. Bathers were found to be at increased risk for gastroenteritis (OR=1.57, 95% CI 1.08-2.31; AFRI (OR = 1.71, 95% CI 0.91 - 3.25); ear ailments (OR = 3.08, 95% CI 1.70 - 5.64); and eye ailments (OR = 2.06, 95% CI 1.01 - 4.25). Fecal streptococci density was predictive of gastroenteritis and AFRI, while fecal coliform density was predictive of ear ailments. With regard to duration of illness, the average duration of gastroenteritis lasted 4.1 days; Acute Febrile Respiratory Illness showed an average duration of illness of 5.7 days while bathers suffered ear and eye ailments for an average of 8.1 and 4.5 days respectively. The percentage of bathers who sought medical treatment ranged from 4.2% to 22.2% depending on the specific illness while the percentage of study participants reporting the loss of at least 1 day of normal daily activity ranged from 7.0% to 25.9% depending on the illness acquired.

CONCLUSIONS: This study provides the strongest evidence to date that bathing in marine recreational waters contaminated with domestic sewage can increase the risk of both enteric and non-enteric illness, and that current methods of assessing such water quality must be reassessed.