

## ABSTRACT

Studies of health risks associated with recreational water exposure require investigators to make choices about water quality indicator averaging techniques, exposure definitions, follow-up periods, and model specifications; but, investigators seldom describe the impact of these choices on reported results. The objectives of this article were to: 1) report illness risk from swimming at a non-point source and urban runoff impacted marine beach, 2) measure associations between traditional and rapid fecal indicator bacteria (FIB) levels and subsequent illness among swimmers and 3) investigate the sensitivity of results to a range of exposure and outcome definitions. In 2009, the authors enrolled 5,674 people in a prospective cohort at Malibu Beach and measured health outcomes 10-19 days later. Concurrent water quality samples were measured for FIB using traditional- and rapid analytical methods. The authors compared illness risk between non-swimmers and swimmers, and among swimmers exposed to different FIB levels. Diarrhea was more common among swimmers than non-swimmers (OR=1.88 95% CI 1.09, 3.24) within 3 days of the beach visit. There was no consistent association between FIB levels and swimmer illness under conditions of relatively good water quality; sensitivity analyses demonstrated that overall inference was not substantially affected by exposure and outcome definition choice.

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MeSH Keywords: Bathing Beaches, Diarrhea, Environmental Exposure, Enterococcus, Epidemiologic Methods, Seawater, Swimming, Water Quality

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