

# Microbial Monitoring and Epidemiologic Study at Two Beach Sites

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## Biosketch

Mr. Samir Elmir received his B.S. in Civil Engineering from Beirut University, his M.S. in Civil Engineering from the University of Miami and he is currently a PhD candidate in the School of Civil and Environmental Engineering at the University of Miami. Mr. Elmir is a licensed professional engineer in the State of Florida, a diplomat with the American Academy of Environmental Engineers and he is an active member on many environmental health and engineering groups. Mr. Elmir has been the director of environmental health and engineering division with the Miami-Dade County Health Department since 1993. During this period Mr. Elmir administered and implemented many regulatory environmental programs including the Florida beach Monitoring and Public Notification Program and the, Florida Safe Drinking Water Program.

difference in health effects between the 2 study beaches. There was some indication that persons with multiple exposures to beaches might be at greater risk for reporting symptoms, suggesting a possible dose-response relationship. Contrary to what was expected, the number of reported symptoms and the microbial indicators did not positively correlate with one another, probably due to the lack of individual microbial exposure assessment and relatively small sample size.

Data collected during the spatially intense water sampling efforts indicated that the source of indicator microbes came from the shoreline with a hotspot in an area that was characterized by elevated indicator microbe concentrations in the sand. This hotspot was likely associated with limited flushing and tidal currents. The sanitary survey

## Abstract

The use of microbial water quality indicators was evaluated in a pilot study at two beaches in Miami Dade County, Florida. These beaches were chosen due to their location within a sub-tropical environment, their close proximity to one another, and historical records which indicated significantly different water qualities. The pilot study consisted of the following: 1) an intensive water and sand quality sampling and testing effort, 2) a sanitary survey, and 3) a prospective cohort epidemiological study.

Human health was evaluated through an epidemiologic questionnaire administered to beach goers. 208 participants who swam at the beaches were interviewed by telephone 8-10 days after exposure, and asked about various gastro-intestinal, upper respiratory and skin ailments. The epidemiologic portion of the study did not support a strong

indicated that there is no point source of microbe contamination impacting the beach. Pets mainly dogs and birds, urban runoff, natural sources such as sand and weeds and people are the principle non-point source of microbe contamination documented at the site.

A future expanded study has been recently funded and initiated which will include: 1) a hydrodynamic modeling effort aimed at predicting indicator microbe concentrations to the water column due to transport and regrowth and 2) a randomized epidemiologic study with a larger number of participants and individual exposure measurement. Data from intensive field and controlled laboratory water and sand quality studies and a site sanitary survey update will be utilized to support this future study.