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Bacteria in sand at some beaches

USA TODAY research

WASHINGTON — Several scientific studies conducted in the last four years at selected beaches around the country show that indicator bacteria (e.g., *E. coli*) exist in sand, according to a report released by the Clean Beaches Council.



Shawn True plays with his dog at Fish Creek Beach in Fish Creek, Wis. The beach has closed in the past from high levels of *E. coli* bacteria.

Mike Roemer, AP

Environmental agencies and health departments regularly test the swimming water at beaches for the presence of indicator bacteria, which in large concentrations can prompt the closing of beaches. Researchers are now looking for the presence of indicator bacteria in the sand itself. (Indicator bacteria are microbes that do not, themselves, cause illness but suggest that fecal matter may be present, which can present a health risk.)

Because sand bacteria survive longer than water-borne bacteria, beach sand may serve as a reservoir of indicator bacteria and affect the health of sensitive adults and children who spend a lot of time in wet sand.


"This report on bacteria in sand at our nation's beaches is a call to action," said Walter McLeod, president of the Clean Beaches Council. "While these data are based on a limited sampling of

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beaches, they clearly indicate that beach sand can be a source of indicator bacteria. We hope this report is a catalyst for more research on the relationship between bacteria and sand and the potential affects on human health."

During the course of a 2003 study in Chicago, the city replaced contaminated sand with truckloads of fresh sand. However, within two weeks, indicator bacteria levels were similar to those collected before sand removal. What surprised the scientists most was that these indicator bacteria remained consistently high regardless of beach water quality.

A 2001 study at two beaches in Miami-Dade County, Florida showed suggests that the shoreline is the primary source of microbes and that this source is most pronounced during high tide when the water level reaches its highest point along the shore.

A 2001-2002 study at beaches in St. Clair County, Michigan showed that fecal indicator bacteria counts were 3-17 times higher in sand than in water, suggesting that sand may be a reservoir of fecal bacteria.

Despite the study findings, there is no evidence that links illnesses to sand exposure.

"We simply don't know how polluted sand affects human health. And while we now realize that sand may have a high number of indicator bacteria, we do not know the medical implications of its presence," stated Dr. Richard Whitman, Station Chief at the Lake Michigan Ecological Research Station at the USGS in Porter, Indiana and the leading authority on sand and bacteria.

Some of these indicator bacteria may be directly deposited by shore birds. These birds can carry human pathogens such as Salmonella in their feces. Other times, the bacteria may have accumulated by drift and sedimentation.

"Water monitoring has improved dramatically and today many states monitor their beaches about every two weeks," noted Dr. Elizabeth Alm, a microbiologist with Central Michigan University. "But to make beaches healthier for the millions who visit each year, we must better understand whether contaminated sand may be the source of bacteria to swimming water."

"It is much harder to monitor sand," added Whitman. "There is no standard way to measure the bacteria or common units of measurements. Also, scientists don't agree on what the numbers mean. New studies are needed to evaluate the disease potential of exposure to disease causing agents in beach sand."

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