Beach sand and the potential for infectious disease transmission: observations and recommendations

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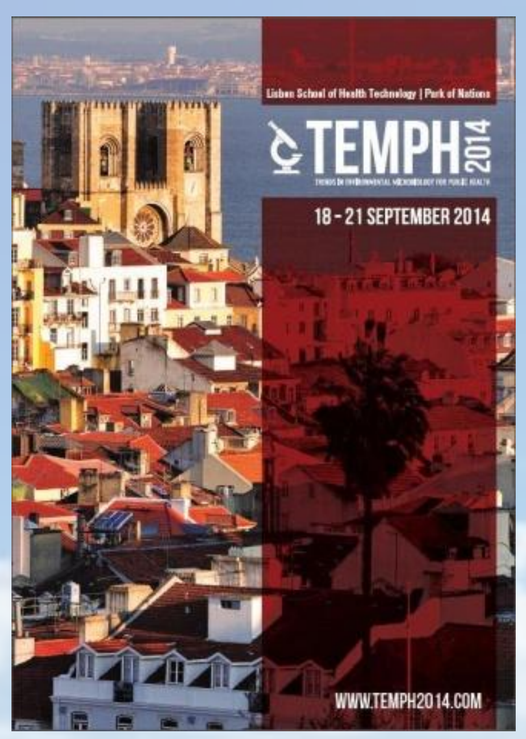
Purpose

Recent studies suggest that sand can serve as a vehicle for exposure of humans to pathogens at beach sites, resulting in increased health risks. In an effort to provide recommendations for sand sampling programmes in an original article, we outlined published guidelines for beach monitoring programmes.

The Team



The article, "Beach sand and the potential for infectious disease transmission: observations and recommendations," was produced by an interdisciplinary team of scientists from 19 universities and research institutions, including the University of Miami, National Institute of Health in Portugal, University of South Florida, Aberystwyth University in the U.K., University of Hawaii, University of Minnesota, National Oceanographic Centre in the U.K., Oporto University, University of Lisbon, Canada Center for Inland Waters Environment, University of Ljubljana in Slovenia, Canisius-Wilhelmina Hospital in the Netherlands, University of Wisconsin, University of Madeira, University of Azores, CBS-KNAW Fungal Biodiversity Centre in the Netherlands, Tel-Aviv University, University of Brighton, and the Polytechnic Institute of Lisbon.

The team was brought together as part of the 2014 Trends in Environmental Microbiology and Public Health (TEMPH) held in Lisbon Portugal in September 2014. This conference was kindly sponsored by ESCMID, Eruditus, RXFgroup, INSA, ESTeSL and Offsetarte.

Recommendations

Specific recommendations of the paper include:

- Identification of disease-causing agent(s), so effective control and monitoring programs can be implemented
- Methods that estimate public health risks from various pathogens in the sand
- Studies that can assess exposure to microbes in the sand by contact, ingestion, and inhalation
- Indicators, other than fecal indicator organisms (FIOs), to determine the presence of sewage and human waste
- Detection and quantification of microbe levels for specific pathogens
- Determine if FIOs are indicative of fecal pollution that carries pathogens, or separated from their original source through survival and regrowth
- Tools to identify sources of pathogens
- Regulatory standards that reflect microbial sources, the pathogens they contain, and the associated health risks
- Reliable sand collection methods that take into consideration that pathogen contamination at sandy beaches tends to be patchy
- Determination of beach sand quality at freshwater versus marine beaches
- Assess beach sand quality based on contamination by land and air
- Standardized methods to recover and disinfect FIOs and pathogens from different types of sands

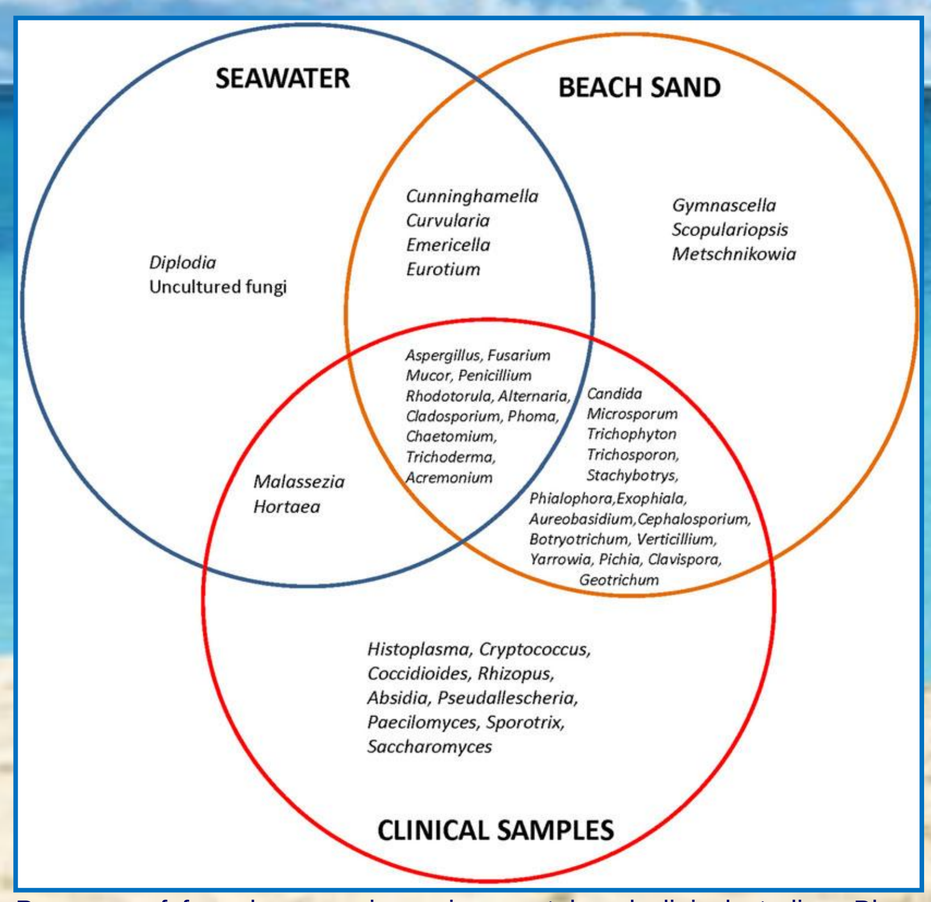


Fig. 1 - Presence of fungal genera in environmental and clinical studies. Blue circle includes. The intersection of the circles includes fungi, isolated from seawater, clinical samples, and beach sand).

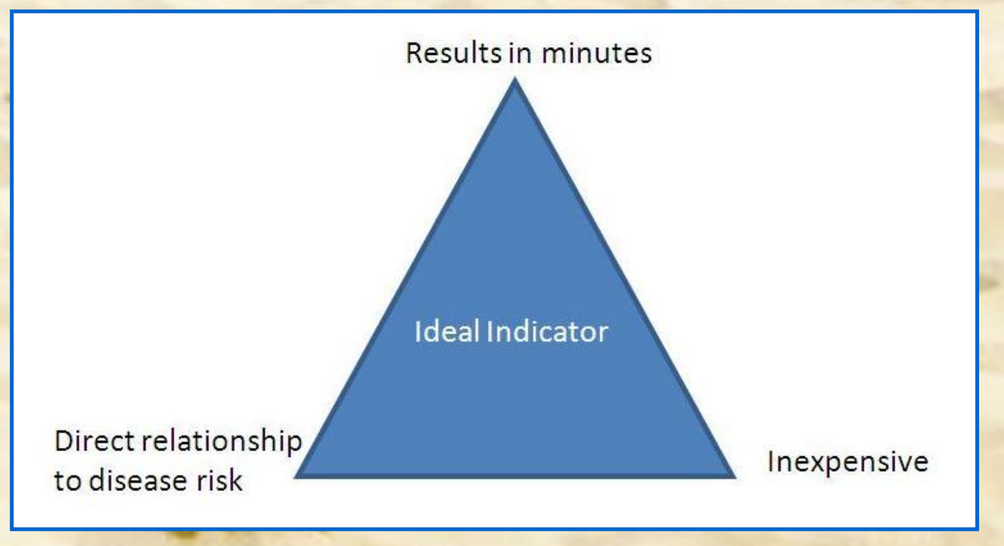


Fig. 2.- Conceptual triangle for ideal characteristics of an indicator organism used for the screening sand quality at beaches.

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