

Public Health Advice on staying safe at the beaches

When visiting a beach some simple common sense steps should be taken:

Tips on staying safe on the beach

- The website www.beaches.ie has lots of useful information on Irish beaches including information on water quality. Check out your favourite beach before you go
- Use bins, toilets and hand washing facilities where provided.
- Always clean your hands by washing them with tap or bottled water if possible before eating or drinking. If no hand washing facilities are available use wipes or alcohol gel. Do not use the water in streams to wash your hands. Help young children to clean their hands properly after being in the water or playing in sand and before eating.
- Cover cuts or open wounds properly with a waterproof dressing/bandaid.
- Dispose of any leftover food, wipes, nappies, empty bottles, etc properly. If no rubbish bins are available, bring your rubbish home and dispose of it there. Don't leave leftover food behind as this will only attract birds, vermin and other wildlife that may then contaminate sand and the general beach environment.
- Avoid any area of the beach that is obviously dirty, for example with litter or animal poo.
- Avoid streams that run down to or across the beach. These stream inlets are very popular with young children but the water quality in them is often poor.
- When a sign has been put up at a beach or stream inlet to advise that the water quality is poor then this advice should be heeded.
- Bring a clean towel or blanket to use if picnicking or sunbathing. A fitted bed sheet that has its corners held up by shoes or beach bags can be very useful to limit sand invading a picnic.
- If you bring your dog for a walk on the beach, clean up after them and dispose of the poo in a bin that is provided at the beach or in your bin at home.
- Take a shower or bath after returning home from the beach

Introduction to Public Health Review and Advice

People who visit the beach often spend long periods of time in contact with the sand. Children in particular enjoy playing and digging in sand. There has been some public concern¹ and media interest both in Ireland² and internationally³ regarding the potential health risks associated with contact with sand, especially when there is a nearby pollution incident. In addition to children, older people and those whose immune system is compromised are more susceptible to illness from contamination.

Contamination of sand

Sources of sand contamination include discharge from wastewater plants, leaky septic tanks, agricultural and urban runoff, inlet streams, domestic and wild animals and birds, as well as from bathers^{4,5}. Studies have also shown that the faecal contamination of beach sand can occur as a result of poor nearby water quality, when faecal pollution washes-in from the shoreline^{6,7}. Contaminated sand can then in turn serve as a diffuse source of faecal contamination of nearby bathing waters^{8,9}. Levels of *E. Coli* (*EC*) in sand have been found to increase from April throughout the summer; while seagulls are thought to contribute to faecal matter in late summer and early autumn¹⁰.

Several studies have found that faecal microorganisms (including *EC* and Intestinal Enterococci (*IE*) which are measured as indicators of bathing water quality in Ireland under the Bathing Water Quality Regulations 2008) can survive for long periods of time in both marine and freshwater sand^{11, 12, 13, 14, 15}. Sand is thought to provide more favourable conditions of temperature and nutrients and protection from the UV of sunlight than the adjacent recreational waters.

A study conducted at bathing beaches in England found pathogenic *Campylobacter jejuni* and *Salmonella* in beach sands. A 2011 review¹⁶ found that dry sands where people are more likely to spend time sunbathing and picnicking generally have the highest levels of faecal contamination having levels up to 38 times higher than in the adjacent water. There appears to be a reducing gradient in faecal contamination levels as you move from dry sand to wet sand¹⁷, to the water^{18,19}, and even from shallow to deeper waters²⁰.

Therefore in many beaches, even where there is no obvious pollution, both dry sand - where most people sunbathe and picnic, and wet sand - where children are more likely to spend time playing and digging, may be contaminated. However, the main risk of faecal pollution on beaches is readily visible i.e. coming into contact with animal excreta, particularly from dogs that are walked on the beach²¹.

Association with illness

Research has found that the greater the intensity of exposure to sand the higher the risk for infection²². This epidemiological study found that "sand contact activities," including digging in sand or being buried in sand, were positively associated with gastrointestinal illness with the most intense exposure of being buried in sand resulting in a 50% increase in illness compared to those with no sand contact. The incidence of gastrointestinal illness and

diarrhoea in this study was 6.3% and 4.2% respectively in the follow-up period. Illness and diarrhoea was highest among young children younger than 5 years (9.5% and 5.2% respectively) and lowest among those aged 55 and older (5.5% and 4.3% respectively). Research has also found that the longer the time spent in wet sand the greater the risk for gastrointestinal illness²³. The increased risk of gastrointestinal illness and diarrhoea with sand activities was found to increase with increased levels of faecal contamination detected in the sand²⁴.

The 2003 WHO guidelines on bathing water quality²⁵ had an extensive review of the risk from faecal contamination in sand, but concluded that there was insufficient evidence to support the establishment of a guideline value for indicator or pathogenic microorganisms in beach sand. A further 2018 review by the WHO while noting that faecal microorganisms are present in beach sand, did not make a recommendation to include monitoring of beach sand levels²⁶. Thus, no regulatory criteria exist currently for microbial levels in sand.

While the overall risk to human health of contamination of sand is still unclear, the above studies highlight that beach activities may be an overlooked source of infection²⁷. Although the observed risks are probably low, the large numbers of people who recreate at beaches and engage in sand contact activities makes these findings of public health importance.

Preventive measures

There are simple low cost preventative measures such as washing hands before eating at the beach, and protecting open wounds at the beach, which may be effective in reducing illness especially among the most vulnerable populations – the very young, the old, and those with compromised immune systems²⁸. Washing sandy hands has been shown to be effective in removing 92% of EC, which would reduce the hand-mouth transfer of bacteria²⁹. Other measures include maintaining the general cleanliness of beach sands, by e.g. cleaning up dog excreta in a safe manner and properly disposing of leftover food or other rubbish that may attract seagulls or other animals³⁰.

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