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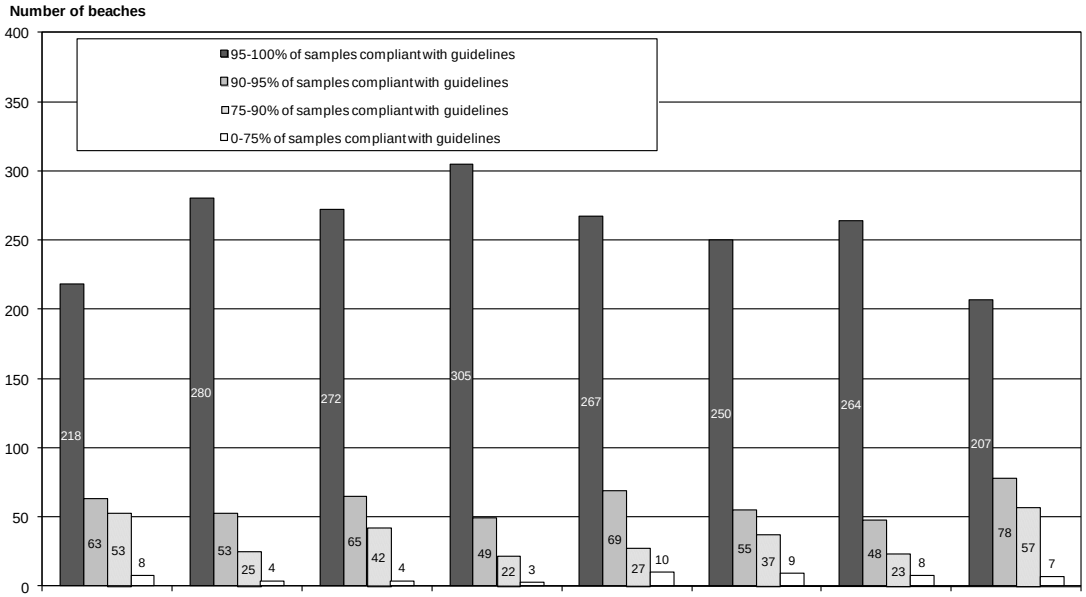
EXCEEDANCES OF BACTERIAL GUIDELINES AT RECREATIONAL BEACHES – MARINE SITES

Recreational contact with polluted water, for example through swimming, can have health effects such as water-borne diseases. Water-borne diseases are caused by ingesting pathogens, which can originate from animal or human faeces, and can be transmitted through drinking-water or recreational water (Ball 2006). In New Zealand, guidelines have been set for water quality at recreational marine and freshwater beaches to protect human health, as part of the Microbiological Water Quality Guidelines for Marine Recreational Areas (Ministry for the Environment and Ministry of Health 2003). The bacterial group *Enterococci* is used to index faecal pollution in recreational marine water (including marine and estuary waters) and therefore the risk of water-borne infection. Councils monitor marine beaches during the swimming season, usually from November to March (Ministry for the Environment 2007).

Contamination of marine water is mainly caused by discharged human sewage and animal and livestock effluent from agricultural and urban areas. Faecal contamination is generally correlated with rainfall events, which cause much higher levels of run-off. In general, marine beaches are less likely than freshwater beaches to have higher background levels of bacteria and longer-lasting contamination events, as faecal pollution is more rapidly diluted and dispersed by currents and large volumes of water at the coast (Ministry for the Environment 2007).

Studies have shown that human exposure to recreational marine water contaminated with *Enterococci* can have health effects, including eye, ear, nose and throat symptoms and respiratory and gastrointestinal illnesses (Corbett et al 1993; Harrington et al 1993; McBride et al 1998; WHO 2003). Epidemiological studies have found that adverse health outcomes in swimmers and surfers were associated with high concentrations of *Enterococci* at marine beaches in New Zealand (McBride et al 1998) and in Australia (Corbett et al 1993; Harrington et al 1993).

Figure 1 : Number of recreational marine sites exceeding guidelines for *Enterococci*, 2003-2004 to 2010-2011

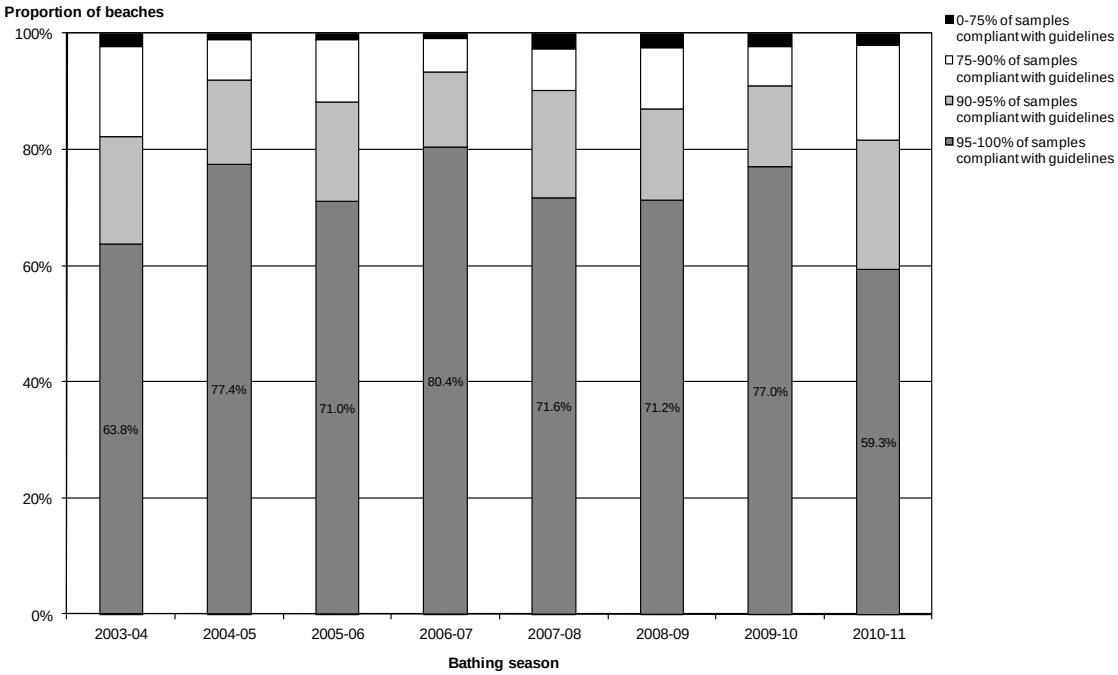


Source: Ministry for the Environment ; B King, Personal communication, 4th November 2011

RECREATIONAL WATER QUALITY – MARINE SITES

From the 2003–2004 to the 2006–2007 bathing seasons there was an increase in the number of recreational marine beaches that were monitored in New Zealand, from 342 to 379 (Figure 1). From 2007–2008 to 2010–2011 the number of marine beaches being monitored decreased relatively steadily from 373 to 349.

Figure 2 : Proportion of recreational marine sites exceeding guidelines for *Enterococci*, 2003-2004 to 2010-2011



Source: Ministry for the Environment ; B King, Personal communication, 4th November 2011

RECREATIONAL WATER QUALITY – MARINE SITES

Between the 2003–2004 and the 2006–2007 bathing seasons there was an overall increase in the proportion of monitored beaches suitable for swimming 'almost all of the time' (with 95% to 100% of samples complying with guidelines), from 63.8% to 80.4% (Figure 2). After this period, the proportion of beaches that were suitable for swimming 'almost all of the time' declined to a small extent, from 80.4% in 2006–2007 to 71.2% in 2008–2009. In 2010-2011 a marked decrease in the number of marine beaches suitable for swimming occurred, with only 59.3% of sites being suitable for swimming "almost all of the time". This is markedly lower than the average for the previous 5 years of 74% (2005-06 to 2009/10), which may be in part due to the nature of the monitoring activities undertaken by the individual councils, although this is unlikely to be wholly responsible for a decrease of this magnitude.

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