

UNIVERSITI TEKNOLOGI MARA

PRESENCE OF *ESCHERICHIA COLI* FROM SELECTED
RECREATIONAL WATER SITES IN HULU LANGAT AND THEIR
HEALTH EFFECTS AMONG CHILDREN

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ABSTRACT

The objectives of this research was to ascertain densities of *E. coli* from selected recreational water sites in Hulu Langat, Sungai Congkak and Sungai Gabai and health effects among children. This cross sectional study was conducted with 52 respondents from Sungai Congkak and Sungai Gabai who swam there and exposed to the *E. coli* contamination. Water samples were taken and subjected to bacteriological analysis using Membrane Filtration Technique to determine density of *E. coli*. Physical measurements included turbidity, pH value and temperature. Sanitary survey was conducted to determine possible factors that contribute to *E. coli* contamination. All respondent also had to answer several questions on respondent's backgrounds and health history to determine sign and symptom of *E. coli* exposure. The findings indicate that all results of density of *E. coli* in Sungai Congkak and Sungai Gabai were exceeding the acceptable density from WHO which is 126cfu/100ml. Therefore, it can be concluded that Sungai Congkak and Sungai Gabai were not safe for swimming. ANOVA test shows there has no significant difference between densities of *E. coli* at each point in Sungai Congkak ($p=0.054$), while there were significant differences in densities of *E. coli* between each point in Sungai Gabai ($p=0.00$). Suspected sources of *E. coli* contamination at Sungai Congkak and Sungai Gabai include stormwater, refuse and bather itself and the most common sign and symptom was diarrhea for both Sungai Congkak and Sungai Gabai. In order to prevent recreational water illnesses (RWIs) there has several recommendations for Ministry of Health, recreational water sites managements, swimmers and parents with young kids. The recommendations were importance for avoiding the RWIs and decrease *E. coli* contamination.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This study focuses on densities of *Escherichia coli* (*E.coli*), a faecal indicator bacteria in recreational waters and its effects on health among children who swim in these recreational sites. It is related to recreational water illnesses (RWIs) spread by swimming in poorly maintained contaminated waters (NEHA, 2006). RWIs are spread by swallowing, breathing, or having contact with contaminated water from recreational water sites. RWIs can cause a wide variety of symptoms, including skin, ear, respiratory, eye, and wound infections. The most commonly reported RWIs is diarrhea (EPA, 2004). In epidemiological studies, the common faecal indicator bacteria, *E. coli* and *Enterococci* exhibit the strongest correlation to swimming and associated gastroenteritis (EPA, 2004).

EPA's water quality criteria for bacteria are based on levels of the above indicator bacteria which demonstrate the presence of faecal pollution. These indicator organisms have long been used to detect and prevent illnesses that may be contracted when engaging in recreational activities in surface waters contaminated by faecal pollution. These organisms generally do not cause illness directly, but have demonstrated characteristics that make them good indicators of faecal contamination and thus potential presence of pathogens capable of causing human illnesses such as gastroenteritis (EPA, 2004).