Assessing factors of *E. coli* contamination of household drinking water in suburban and rural Laos and Thailand

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ABSTRACT

Drinking water (DW) can serve as a route for disease transmission if not properly managed. The study assessed the effect of different factors on *Escherichia coli* quantities in DW in household water storage containers in suburban and rural villages in Laos and Thailand. Higher *E. coli* concentrations in DW were found in Laos compared to Thailand, especially in households without toilets (in Laos) and in rural rather than in suburban villages. In suburban Laos, house material, storage container types and lack of toilets were significantly associated with *E. coli* contamination of DW, whereas in rural Laos, corresponding significant factors were rain-fed water, containers with lids and lack of toilets. In suburban Thailand, rain-fed water, storage container types and container cleaning frequency were significantly associated with DW contamination, while house materials, manually collected rainwater and container cleaning frequency were associated with contamination in rural Thailand. Socio-demographic characteristics were less associated with *E. coli* contamination of DW in this study. Treatment of household stored water (e.g. boiling), regular cleaning of rain jars as well as the provision of household toilets, especially in Laos, can provide barriers against *E. coli* contamination of DW.

Key words | *Escherichia coli*, household drinking water, Laos, socio-demographic, Thailand

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INTRODUCTION

Over the last decade, the diarrhoeal mortality among children under five has decreased globally from 1.2 million (in 2000) to 760,000 (in 2011), but 90% of these child deaths are still linked to water, sanitation and hygiene (UNICEF 2013). In Southeast Asia, 363,904 diarrhoeal deaths of all ages were estimated to be linked with inadequate water, sanitation and hygiene, which constitute 56% of diarrhoeal diseases in this region (Prüss-Ustün *et al.* 2014).

Storage of drinking water (DW) is a common practice in many countries where access to DW is either not available within the home environment or, if available, flows intermittently. DW can serve as a source of diarrhoeal disease transmission if not properly managed (WHO 2002). Among the causes of diarrhoeal disease incidence, the storage of DW within the household environment remains a significant risk factor (Roberts *et al.* 2001; Günther & Schipper 2013). All

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