

# URINE FLUORIDE LEVELS AND DENTAL FLUOROSIS IN SCHOOL CHILDREN IN THREE SUBDISTRICTS OF CHIANG MAI PROVINCE WITH DIFFERENT FLUORIDE LEVELS IN THE GEOTHERMAL WATER SOURCES

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**SUMMARY:** The risk of developing dental fluorosis in Chiang Mai province varies according to the level of fluoride (F) contamination in the geothermal water sources. The urine F level is the most sensitive and promising biomarker in school children for monitoring the daily F intake and excretion. In addition, the urine F level can provide an early warning for the prevention of dental fluorosis in the dental fluorosis surveillance program in school children as a high F intake is detectable before the dental fluorosis occurs. The present study examined the prevalence of dental fluorosis and the urine F levels in school children in 3 subdistricts with differing F levels in the geothermal water sources. The urine F levels were measured in spot urine samples with a fluoride ion selective electrode and reflected the F intake over the previous 3–7 days. In the low-F Yang Pao subdistrict in Om Koi district, the F level in the drinking and cooking water was 0.10–0.20 mg/L and the urine F range was 0.00–1.88 mg/L with a 95%CI of 0.77–0.90 mg/L. In the moderate-F Mae Pu Kha subdistrict in San Kamphaeng district, the F levels in the drinking and cooking water were 0.04–2.76 mg/L and 0.04–2.98 mg/L respectively, and the urine F range was 0.00–2.35 mg/L with a 95%CI of 1.25–1.35 mg/L. In the high-F Buak Khang subdistrict in San Kamphaeng district, the F levels in the drinking and cooking water were 0.00–0.58 mg/L and 0.00–4.78 mg/L respectively, and the urine F range was 0.00–6.89 mg/L with a 95%CI of 2.72–3.46 mg/L. Significant differences were present in the urine F levels and in the prevalence of dental fluorosis in the 3 subdistricts. The prevalence of dental fluorosis correlated with the urine F levels.

Keywords: Chiang Mai province, Thailand; Dental fluorosis; Fluoride excretion; Fluoride intake; Urine fluoride.

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