

# Continuous urinalyses clarified that urine pH reflected the changes of dietary habits and that urobilinogen reflected *falciparum* malaria in Solomon Islands.

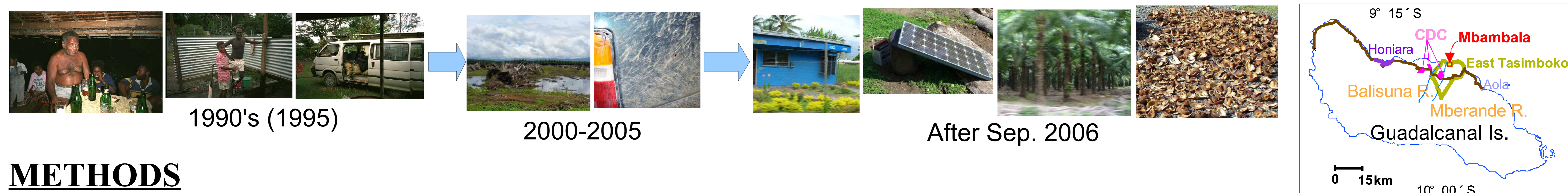
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## INTRODUCTION

We have conducted the health checks including urinalysis using dipstick and malaria active case detection in Solomon Islands since 1995. The target area was originally malaria endemic, where the parasite rates of apparently healthy subjects were always more than 30% during 1990's. There people experienced the drastic social change, from rapid modernization in 1980's-90's, to forced coming back to subsistence horticulture for about 6 years around 2000 by the "Ethnic Tension" between Guadalcanal and Malaita, and subsequently to ongoing recovery after rebuilding of the road and bridges between the village and the capital city Honiara in the late September 2006.

The aim of this study was to clarify the health effects of such drastic social changes based on the longitudinal data.



## METHODS

Health check patrols were done over 5 times in 7 villages (Photo, Table 1), when malaria active case detections were done by SIMTRI (Solomon Islands Medical Training and Research Institute) staff as routine work.

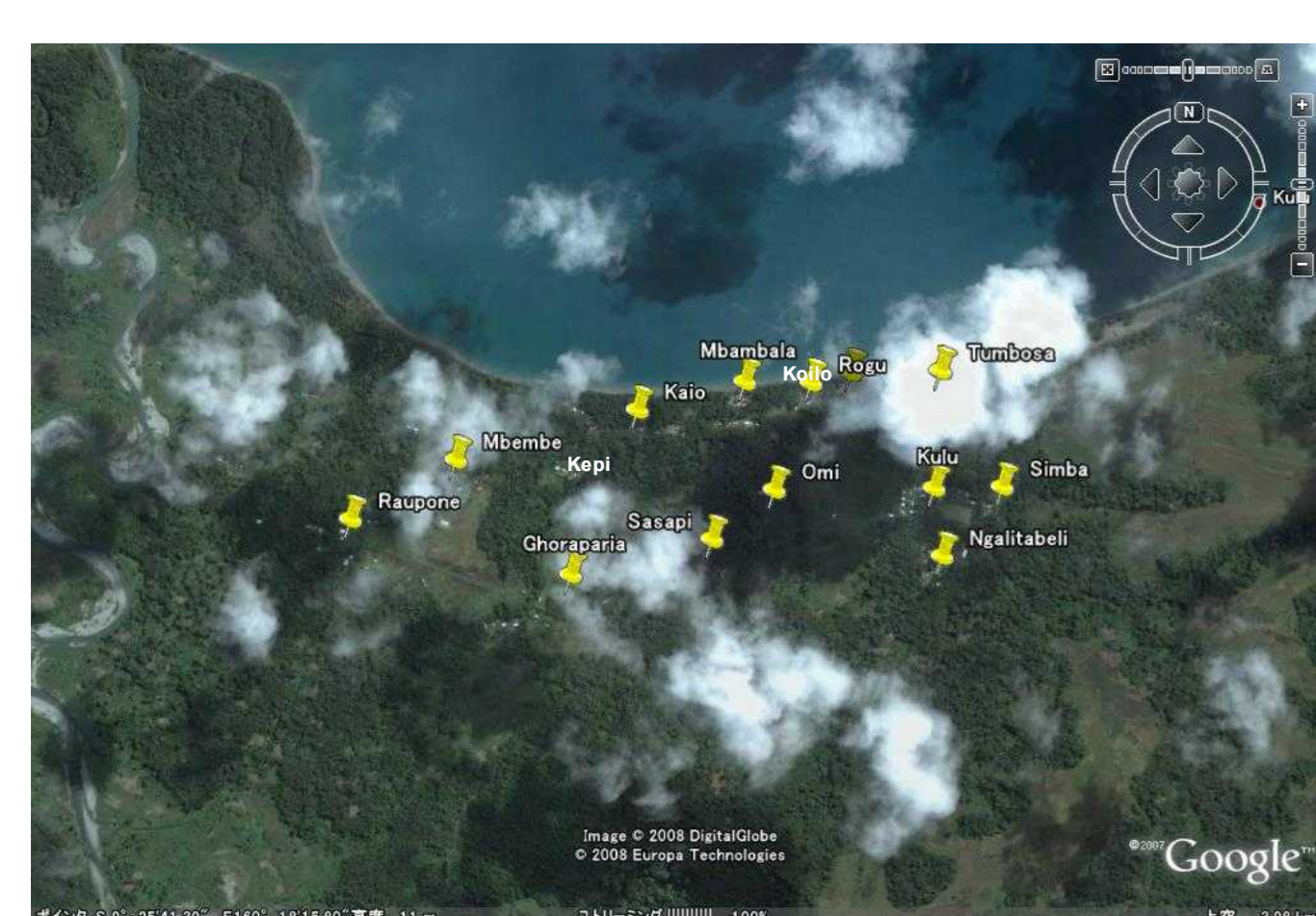


Table 1. Urinalysis schedule

	Timing	Device	Subjects
Nov.1995	Morning	UROLAB-STICKS	112 from 7 villages
Feb.2006	Spot*	N-Multisticks SG-L	190 from whole area
Sep.2006	Morning	N-Multisticks SG-L	206 from 7 villages
Sep.2007	Morning	N-Multisticks SG-L	137 mainly from 5 villages*
Feb.2008	Morning	N-Multisticks SG-L	72 mainly from 2 villages*

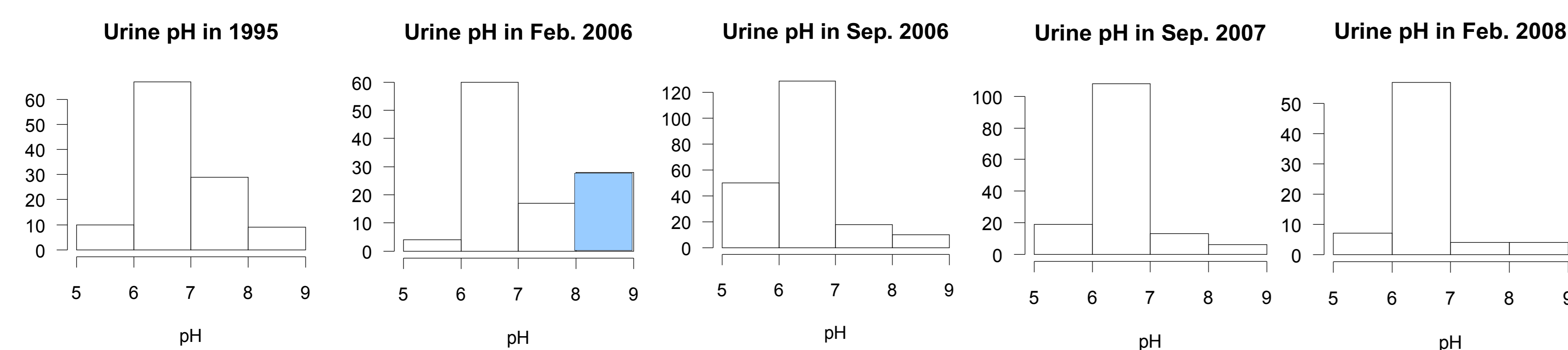
\* Due to logistic restrictions

Every time we explained the study to village people to ask them voluntary participation and obtained the informed consent from the participants. This research passed the ethical investigation by the Ethics Committee for the Epidemiological Studies of Gunma University and by Solomon Islands Medical Advisory Committee.

## RESULTS

The social change affected dietary habits, which affected disease prevalences or at least urinary pH. Alkaline urine (pH8 or 8.5) was found in 9/115 in 1995, 28/109 in Feb. 2006, 5/207 in Sep. 2006, 6/146 in Sep. 2007, and 4/72 in Feb. 2008. The proportion of alkaline urine was significantly higher in Feb. 2006 than earlier and later periods. Times of rice consumption per day had significant negative correlation with urinary pH (see figures below).

Malaria parasite rates decreased from more than 30% mainly composed of *P. falciparum* in 1990's to 25% in September 2006, and to 15-20% mainly composed of *P. vivax* in 2007-2008. Urinary urobilinogen positives were found only in *P. falciparum* positive individuals in 2007-2008.



## DISCUSSION

It may reflect the fact that after rebuilding the road and bridges, staple food changed from tubers to rice/noodle. In our previous studies about urinary pH and lifestyles in the Western Province (Nakazawa et al., 2002), traditional pacific lifestyle with tuber and fish diet were related with alkaline urine which might prevent bladder stone. The present result was consistent with the previous finding.

Urobilinogen positives were found only in *P. falciparum* positive individuals in 2007-2008, which may suggest the possibility of urinalysis as an alternative tool to detect *P. falciparum* malaria endemicity.

## REFERENCES

Nakazawa M, Yamauchi T, Tanaka M, Ishimori D, Furusawa T, Midorikawa T, Ohtsuka R (2002) Community health assessment by urine dipstick screening in relation to the variety of lifestyles in Solomon Islands. *People and Culture in Oceania*, 18: 35-44

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