

Daily total fluid intake and changes in body mass index among Hong Kong primary school students

Ruan RL¹, Ho SY¹, Tin SPP¹, Chen JJ¹, Lee KY², Chung WH², Lam TH¹

¹School of Public Health, The University of Hong Kong

²Student Health Service, Department of Health, Government of HKSAR



Frequency of daily fluid (cups) among Hong Kong primary school students ?

Prospective association between daily total fluid intake and BMI changes ?

Background

- Sugar-sweetened beverage (SSB) intake has been associated with weight gain.
- Emerging evidence has linked non-sugar-sweetened beverage (NSSB, e.g. water, tea, soup) intake to weight loss.
- SSB intake has been linked to various unhealthy behaviours.

Methods

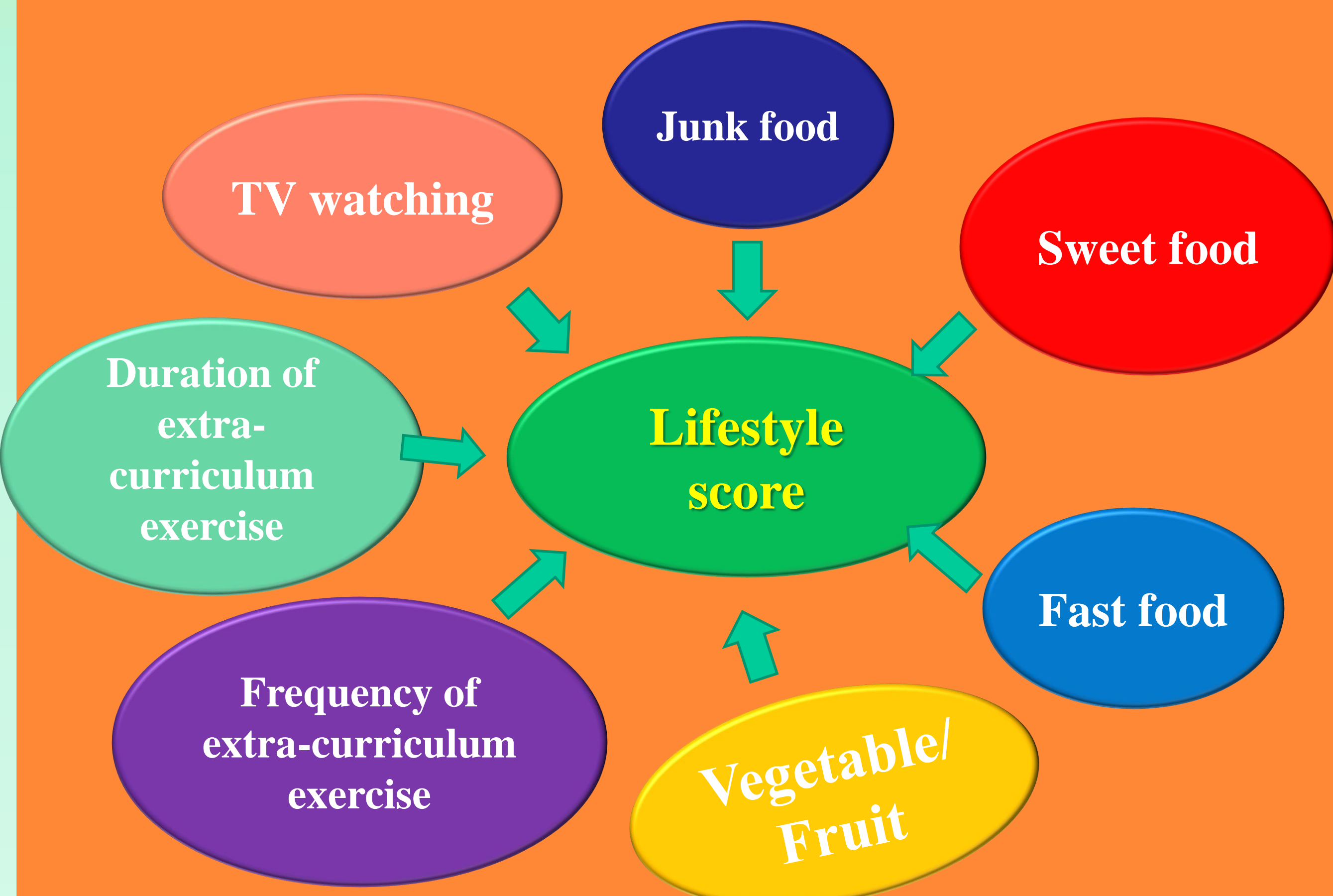
Subjects

- Data source: **Student Health Service (SHS)**, Department of Health
- Sample size: **75635** Primary 4 students in Hong Kong
- Follow-up: 1998 - 2000
- Mean age: 10.0 years (SD 0.7); 50.9% were boys.

BMI was derived from weight and height measured by trained nurses.

Questionnaire

- ★ **Daily total fluid intake** was assessed with the item “**My habit of fluid intake (including plain water, tea, squash, milk, soup, etc.) each day is**”, with options of **<2 cups** (reference), **2 to 4 cups**, **4 to 6 cups** and **6+ cups**.
- ★ A **Primary 4 lifestyle score** (ranged from 7 to 28) was calculated based on 7 items (each scored 1 to 4).



- 7-13 → **Healthy lifestyle** → indicating **less SSB intake**
- 14-21 → **Moderately healthy lifestyle**
- 22-28 → **Unhealthy lifestyle** → indicating **more SSB intake**

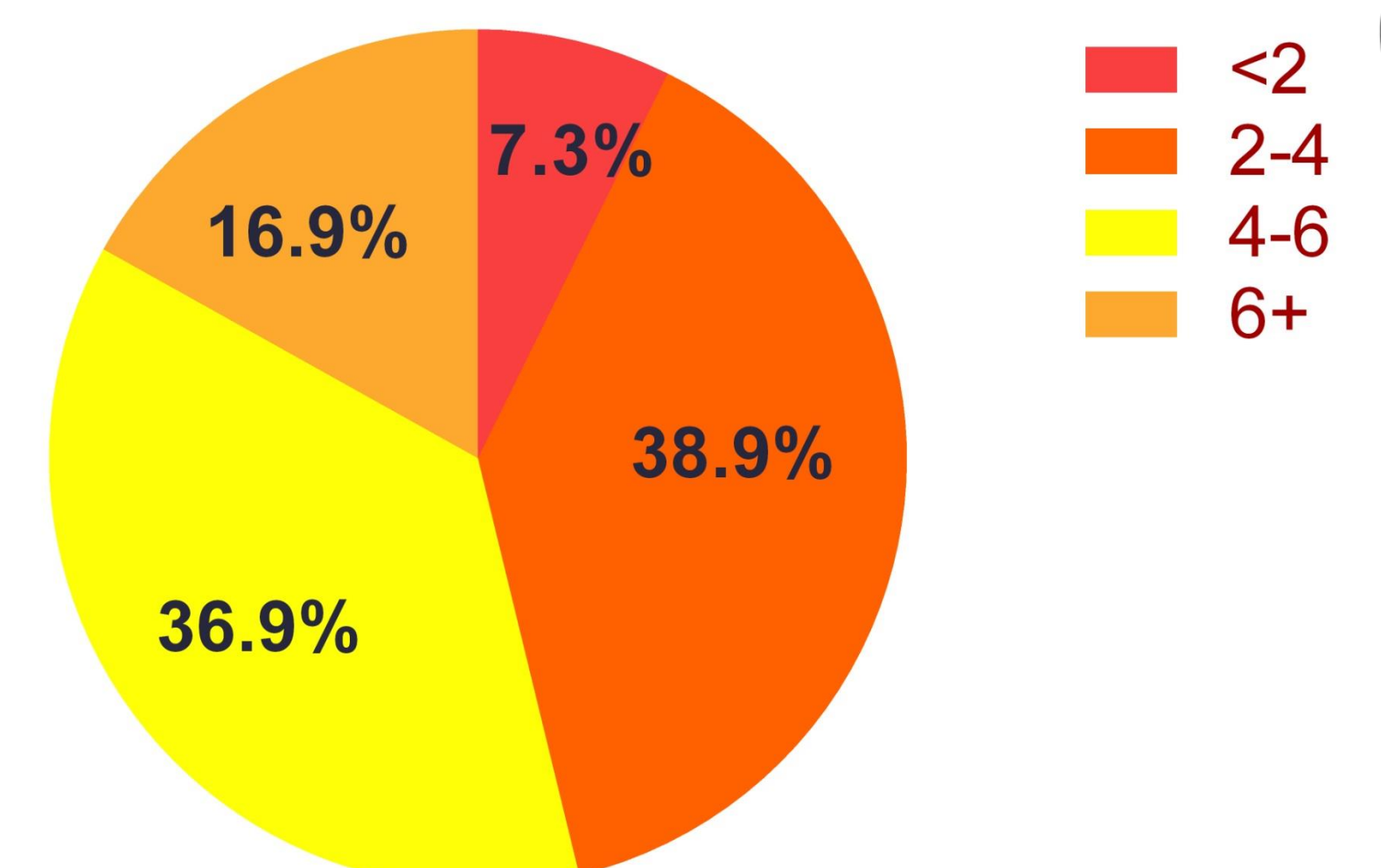
Data analysis

- Generalized linear regression models were fitted to assess the effect of baseline fluid intake on BMI change.
- Adjustment for sex, socio-economic proxies and lifestyle score

Results

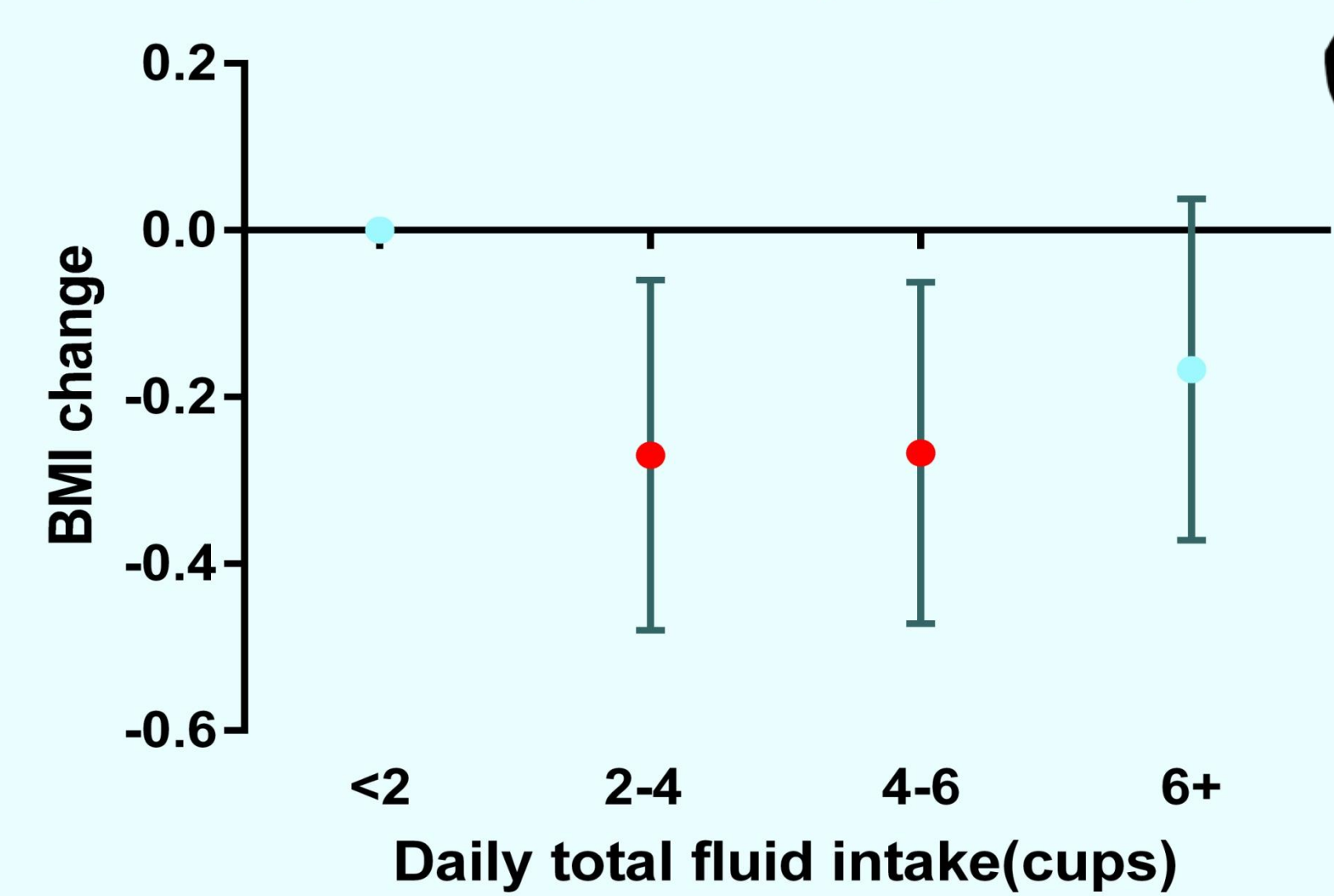
Frequency of total daily fluid intake at baseline

Frequency of total daily fluid intake (cups)



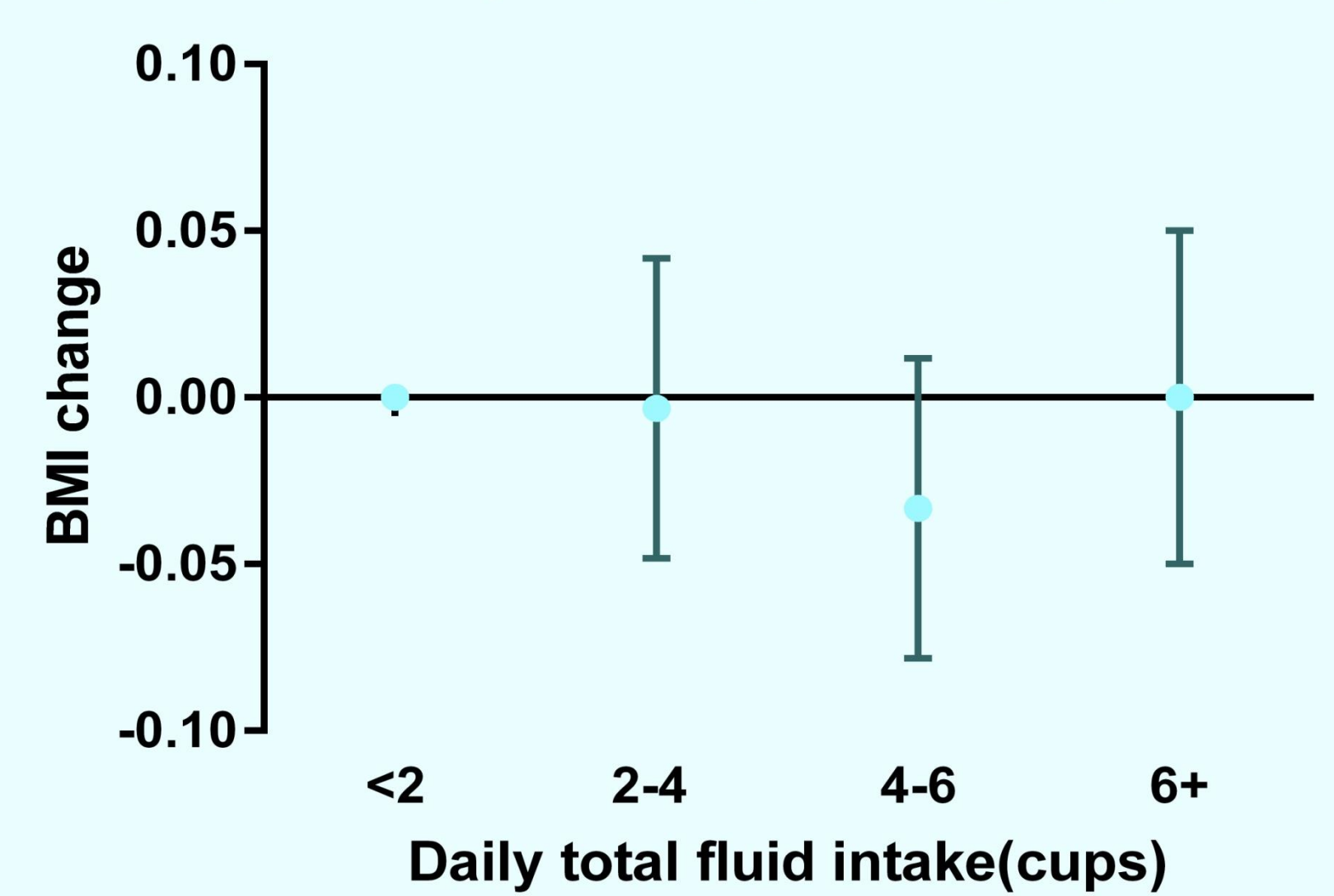
In children with **healthy lifestyle**, greater total fluid intake predicted lower BMI.

Healthy Lifestyle (n=3800)



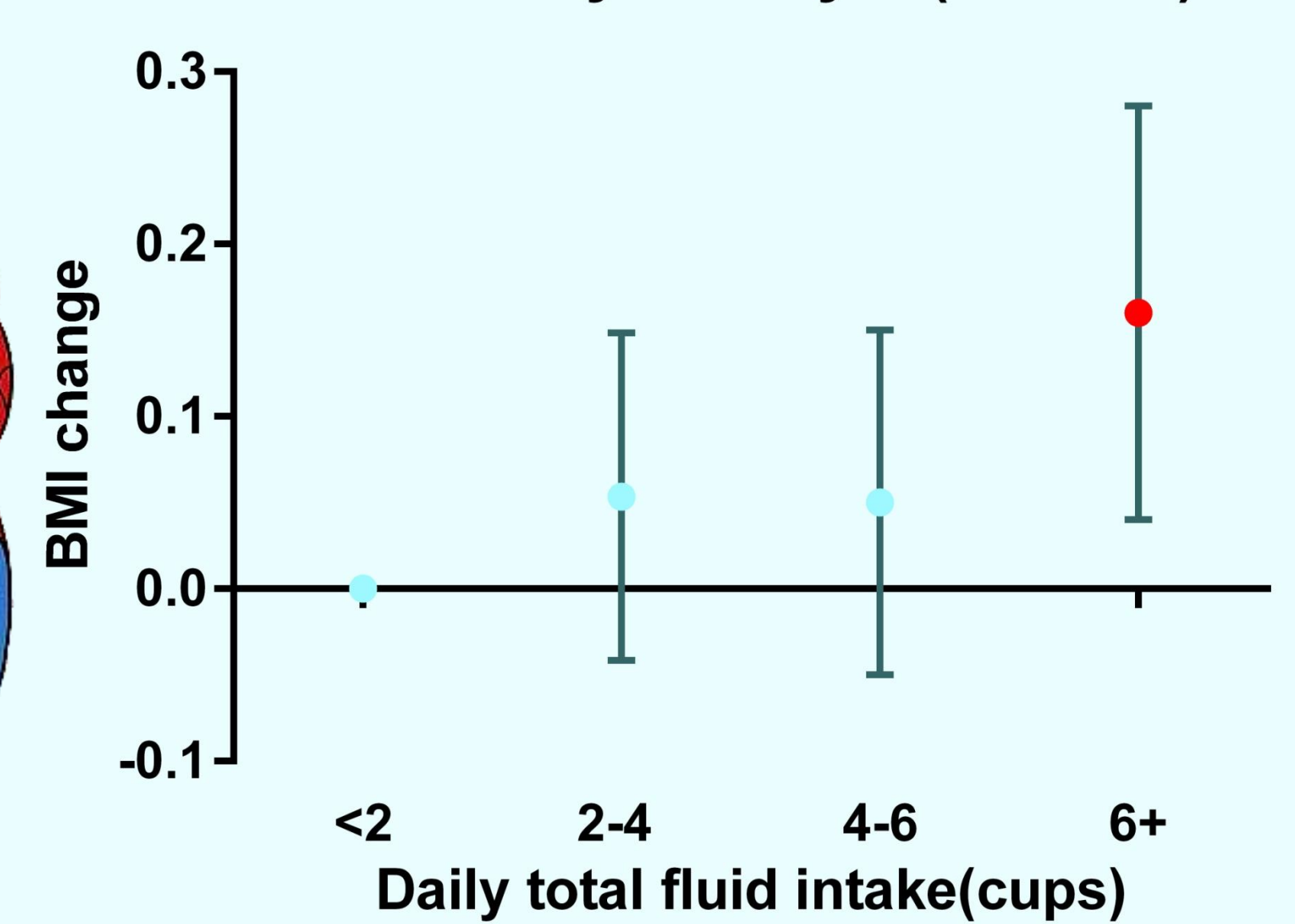
In children with **moderately healthy lifestyle**, total fluid intake was not associated with BMI.

Moderately Healthy Lifestyle (n=64002)



In children with **unhealthy lifestyle**, greater total fluid intake predicted higher BMI.

Unhealthy Lifestyle (n=7833)



Source: Alex Solis

Conclusions

In Hong Kong primary school children with **healthy** (indicating lower SSB intake) and **unhealthy** (indicating higher SSB intake) lifestyle, greater daily total fluid intake predicted a decrease and increase in BMI, respectively.

Future studies with better measurement of SSB and non-SSB intake are warranted.

