Background
A growing body of evidence suggests that hyperhydration and exercise-associated hyponatraemia (EAH) are critical issues during endurance events. Therefore, we studied a cohort of marathon runners to gain further insights into EAH's aetiology and prevalence.

Methods
167 participants in the 2006 Zurich Marathon (time limit 5 h) were recruited the month before the race. Their body mass was measured and a blood sample was collected just before the start and immediately after the race, which took place in cool and rainy conditions. Fluid intake during the race was recorded as well.

Results
Body mass change during the race correlated with post-race sodium levels ($r=-0.72$, $p<0.0001$) and with sodium change during the race ($r=-0.66$, $p<0.0001$). After correcting the plasma sodium concentration for the plasma volume change occurring during the race, the association between body mass change and sodium change disappeared ($r=0.04$, $p=0.59$). Fluid intake correlated significantly ($r=-0.43$, $p<0.0001$) with plasma sodium change between the start and finish of the race. Post-race sodium levels and post-race osmolality were significantly correlated ($r=0.68$, $p<0.0001$). Five subjects (3 %) developed EAH.

Conclusion
In spite of cool and rainy weather conditions and a short time limit of five hours, we observed an incidence of about 3 % EAH. A second conclusion was that plasma sodium change during the race as well as the level of post-race sodium lead to comparable correlations with body mass change. A third observation was that correction of sodium levels for plasma volume change completely disrupted the correlation between plasma sodium change and body mass change, indicating that dilution, or over-consumption of liquids, was an important determinant of plasma sodium change. Fourthly, we demonstrated a direct correlation between fluid intake and plasma sodium change.

Keywords: Sport Nutrition, Exercise, Marathon