A meta-analysis of weight change in 1st year university students; update on the Freshman 15
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Background
Observational studies report that as students transfer from school to university, there is a tendency to gain weight. This phenomenon is known as the Freshman 15 in North America, referring to the claim that on average weight gain is 15 pounds (6.8 kg) in the first year of university. More recent studies, however, have quantified this gain to actually be between 1 and 6 kg. In 2009 a meta-analysis reported an average weight gain of 1.75 kg (3.86 lbs), (95%CI = 1.73-1.77). This review included studies primarily from North-America, and only presented the mean of weight gain for the entire sample.

Our present meta-analysis expands the search to include articles from several geographical regions, conducts sub-group analysis and updates the literature from the last five years.

Methods
We conducted a search on standard electronic databases, and the references of included studies. Only peer reviewed articles with data from longitudinal studies were included. Screening was performed by two reviewers. The quality of papers was assessed and data extraction was done in a systematic way. Due to poor reporting in studies a complete case analysis approach and an imputed approach was employed.

Results
22 studies (sample size: 5,489) were included in our complete-case meta-analysis. The mean weight gain in first year university students was 1.36 kg (3 lbs) (95%CI: 1.15–1.57). Across the studies, 61% of the students gained weight and among those who gained weight, the pooled mean weight gain was 3.38 kg (7.5lbs) (95%CI: 2.80–3.95). There was no statistically significant difference between male and female. Analyses also examined differences between geographical regions length of follow-up, data collection method and quality of the studies, in relation to the reported weight changes in 1st year students.

Discussion
Weight gain in university students has been shown to be a common phenomenon. This study updates the literature and demonstrates that weight gain in university students is important and statistically significant. As universities have an important impact on shaping the habits of young adults, further policies on healthy environments need to be implemented. This study leads to the development of an evaluation of the role of the environment on the Freshman 15.

Key messages
• Our meta-analysis shows a majority of first year university students gain weight. Over 2 to 8 months, 1st year university students who gain weight, gain on average 3.43 kg.
• University is a critical period for weight gain and further health policies need to be implemented.