# Need for further analysis to explore the association between ADHD and asthma - Authors' reply

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We thank Wang and colleagues1 for proposing additional analyses that we did not fully report in our paper exploring the association between ADHD and asthma2.

With regards to our meta-analysis, Wang et al. suggested additional subgroup analyses to explore the effect of study continent, participants’ age (children/adolescents and adults), and categorical diagnosis of ADHD. As for study continent, we had indeed included this variable as a regressor in the meta-regression in our previous analyses and we found no significant effects (Appendix 11, pag 64 of our paper). We have now conducted subgroup meta-analyses by continent and found fairly similar pooled unadjusted and adjusted ORs (where available) across Europe, America, and Asia (no studies for Africa and only two for Australia were availble, Appendix 1 to the Letter). In terms of age effect, the association between ADHD and asthma remained significant both in children/adolescents and in adults (Appendix 1 to this Letter). Finally, with regards to categorical diagnosis, we refer to our previously reported sub-group analysis limited to studies with (semi)-structured interviews (Appendix 8, pag. 30 of our paper), as we cannot be certain that other diagnostic methods we considered are based on a categorical diagnosis. In sum, there is no meta-analytic evidence that continent, age, and type of diagnosis moderate the association between ADHD and asthma.

Concerning the Swedish population-based study, Wang et al. suggested an analysis stratified by sex. We have now conducted such analysis and found that the association between ADHD and asthma is stronger in females (Appendix 2 to this Letter). Results were also consistent when we restricted asthma identification to clinical diagnosis in the sensitivity analysis.

Overall, these analyses provide additional insight into the cross-sectional association between ADHD and asthma. The next step will be to understand the underlying causal mechanisms. Based on our new analysis stratified by sex, genetic and/or hormonal factors might play a role in explaining the association between ADHD and asthma.

**References**

1.Wang S, Zhang XY, LiuHZ. Need for further analysis to explore the association between ADHD and asthma. *Lancet Psychiatry*, in press.

2. [Cortese S](https://www.ncbi.nlm.nih.gov/pubmed/?term=Cortese%20S%5bAuthor%5d&cauthor=true&cauthor_uid=30054261), [Sun S](https://www.ncbi.nlm.nih.gov/pubmed/?term=Sun%20S%5bAuthor%5d&cauthor=true&cauthor_uid=30054261), [Zhang J](https://www.ncbi.nlm.nih.gov/pubmed/?term=Zhang%20J%5bAuthor%5d&cauthor=true&cauthor_uid=30054261), et al. Association between attention deficit hyperactivity disorder and asthma: a systematic review and meta-analysis and a Swedish population-based study. *Lancet Psychiatry* 2018; **5**:717-26.