

# Asthma and physical activity in childhood

Citation for published version (APA):

Eijkemans, M. (2022). *Asthma and physical activity in childhood*. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20221014me>

**Document status and date:**

Published: 01/01/2022

**DOI:**

[10.26481/dis.20221014me](https://doi.org/10.26481/dis.20221014me)

**Document Version:**

Publisher's PDF, also known as Version of record

**Please check the document version of this publication:**

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

[www.umlib.nl/taverne-license](http://www.umlib.nl/taverne-license)

**Take down policy**

If you believe that this document breaches copyright please contact us at:

[repository@maastrichtuniversity.nl](mailto:repository@maastrichtuniversity.nl)

providing details and we will investigate your claim.

## Impact

This chapter describes the scientific and societal impact of this thesis.

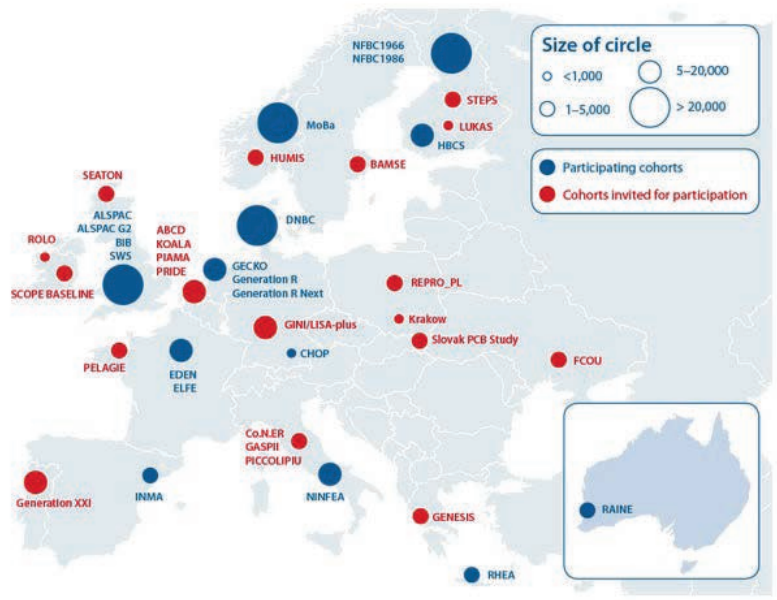
### Impact on research

This thesis was aimed to investigate the association between asthma and physical activity, and gave a comprehensive overview of the possible association, both based on original studies and a systematic review of the existing literature, supplemented with new insights from the literature that have been published in the last years. Due to the thoroughness of the research and consistency of the results, it is safe to state that asthma and physical activity are not clearly related. Clear answers in the scientific field are necessary to prevent researchers to continue to do new studies on the same subject. This thesis clarifies that it is not necessary to continue to focus on the association between asthma and physical activity in childhood. For specific groups, for example very young children (under the age of 2) it has to be said that this conclusion is not clear yet, especially because of the lack of validated measurements of physical activity at this age. This thesis helps researchers to focus on the subjects where answers are not clear yet.

The validation of asthma questions is of great value for the proper interpretation of the results of epidemiological research. Chapter 2 describes an important subject for future epidemiological research on asthma. The commonly used asthma definition 'parent reported physician diagnosed asthma' showed only moderate agreement with general practitioner (GP) recorded asthma diagnosis. Especially children with early transient wheeze can be mislabelled as having an asthma diagnosis. This could lead to overestimation of the true asthma prevalence in epidemiological studies. In this thesis we showed that it is advisable to use a combination of asthma questions, preferably a uniform definition such as MeDALL definition of current asthma. To improve collaboration with other cohorts in Europe and globally it would be helpful to use the same definition of current asthma, as suggested by the MeDALL group.<sup>1,2</sup>

Chapter 6 describes a large European collaboration study. During analysing and writing this study, the input of all these different European researchers was immense and gave an extensive representation of different European cohorts. It brings asthma research, and research in general, closer together and brought this study to a higher level. For future research such collaborations are of great importance. It increases the study size and gives a broader representation of types of behaviour and environments. Another positive effect of these collaborations is that it leads to a decrease of research waste: possibly interesting research questions are not investigated because it is not possible to study and publish all possible associations in a birth cohort. Moreover, it decreases the

risk of publication bias: analyses of smaller cohorts have often less statistical power and are less likely to make an impact in scientific journals. By combining the results of several cohorts, the statistical power will increase and thereby the chances of publication of important results. The experiences gained by organising this collaborative study have taught us the importance of data harmonisation beforehand and legal implications, such as data safety. For future research, it would improve the quality and progress if collaborations become more aligned. A good example is the LifeCycle Project, which is a collaboration of European birth cohort studies that is working on bringing all the data together in one virtual database: the EU Child Cohort Network (figure 8.1).<sup>3,4</sup> Especially the organisation with all data of all participating cohorts in one virtual database, without individual issues on legal and ethical aspects of data sharing and data safety is a huge step forward from the current collaborations that are already present.



**Figure 8.1:** the LifeCycle Project and the EU Child Cohort Network (adapted from <https://lifecycle-project.eu/for-scientists/the-eu-child-cohort-network/>).

## Impact on public health and health care

The societal impact of this thesis is especially supportive for counselling and management of physical activity in the general population and children who are prone to developing asthma. The results are relevant for all health care workers that are involved in community medicine for children (in the Netherlands organised as the

‘jeugdgezondheidszorg’ (JGZ)), family doctors and paediatricians. For asthma patients and their parents it is important to realise that it is safe to exercise and this should be encouraged for several health benefits. It is important for all children to adhere a healthy lifestyle. For physical activity the current advice is according to the 2020 global WHO recommendation: at least 60 minutes of moderate-to-vigorous physical activity (MVPA) per day on average.<sup>5</sup> For children who are prone to developing asthma, or who have asthmatic symptoms, this advice is the same. This thesis shows physical activity does not increase the risk of developing asthma. From other literature, described in this thesis, we know that physical activity improves quality of life and asthma control in children with asthma.<sup>6,7</sup> Therefore, it is important that children who show the first signs of asthma are stimulated to stay active.

While the physical activity recommendations are general, the management and counselling should be tailor made. Children (and parents) should not be hesitant in using bronchodilating medication in order to be able to be physically active without asthmatic symptoms. Another important reason to adopt a healthy lifestyle, is the obvious relation of obesity and subsequent increased risk of developing (or worsening of existing) asthma. Children who have a healthy weight status, are less prone to develop asthma. As physical activity provides a major contribution to a healthy lifestyle (together with a healthy diet), we should continue to advice all children (and adults) to adhere to the WHO or national guidelines of physical activity.

Another aspect of this thesis with societal impact on health care is the difference between parent reported physician diagnosed asthma and GP recorded asthma diagnosis in childhood. Chapter 2 shows that there are large differences in the way parents experience an asthma diagnosis set by a physician compared to their GP, especially when it concerns asthma diagnosis in very young children. For clinical practice, it is important for physicians to use the correct wordings when explaining (preschool) wheeze to parents and that parents and physicians work together in shared decisions concerning the health of the child.

## References

1. Gehring U, Wijga AH, Hoek G, Bellander T, Berdel D, Bruske I, Fuertes E, Gruzieva O, Heinrich J, Hoffmann B et al. Exposure to air pollution and development of asthma and rhinoconjunctivitis throughout childhood and adolescence: A population-based birth cohort study. *Lancet Respir Med*. 2015;3(12):933-942.
2. Pinart M, Benet M, Annesi-Maesano I, von Berg A, Berdel D, Carlsen KC, Carlsen KH, Bindeslev-Jensen C, Eller E, Fantini MP et al. Comorbidity of eczema, rhinitis, and asthma in ige-sensitised and non-ige-sensitised children in medall: A population-based cohort study. *Lancet Respir Med*. 2014;2(2):131-140.
3. Jaddoe VVW, Felix JF, Andersen AN, Charles MA, Chatzi L, Corpeleijn E, Donner N, Elhakeem A, Eriksson JG, Foong R et al. The lifecycle project-eu child cohort network: A federated analysis infrastructure and harmonized data of more than 250,000 children and parents. *Eur J Epidemiol*. 2020;35(7):709-724.
4. Lifecycle project: Eu child cohort network. [accessed 02-12-2021]. <https://lifecycle-project.eu/for-scientists/the-eu-child-cohort-network/>.
5. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, Carty C, Chaput JP, Chastin S, Chou R et al. World health organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med*. 2020;54(24):1451-1462.
6. Wanrooij VH, Willeboordse M, Dompeling E, van de Kant KD. Exercise training in children with asthma: A systematic review. *Br J Sports Med*. 2014;48(13):1024-1031.
7. Carson KV, Chandratilleke MG, Picot J, Brinn MP, Esterman AJ, Smith BJ. Physical training for asthma. *Cochrane Database Syst Rev*. 2013;(9):CD001116.