



## Research Article

# School-level variation in children's moderate to vigorous intensity physical activity before and after COVID-19: a multilevel model analysis

Ruth Salway,<sup>1,2\*</sup> Danielle House,<sup>1</sup> Robert Walker,<sup>1</sup> Lydia Emm-Collison,<sup>1</sup>  
Katie Breheny,<sup>2,3</sup> Kate Sansum,<sup>1</sup> Joanna G Williams,<sup>2,4</sup>  
William Hollingworth,<sup>2,3</sup> Frank de Vocht<sup>2,3</sup> and Russell Jago<sup>1,2,3,5</sup>

<sup>1</sup>Centre for Exercise, Nutrition & Health Sciences, School for Policy Studies, University of Bristol, Bristol, UK

<sup>2</sup>Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK

<sup>3</sup>The National Institute for Health Research, Applied Research Collaboration West (NIHR ARC West), University Hospitals Bristol and Weston NHS Foundation Trust, Bristol, UK

<sup>4</sup>Communities and Public Health, Bristol City Council, Bristol, UK

<sup>5</sup>NIHR Bristol Biomedical Research Centre, University Hospitals Bristol and Weston NHS Foundation Trust and University of Bristol, Bristol, UK

\*Corresponding author [Ruth.Salway@bristol.ac.uk](mailto:Ruth.Salway@bristol.ac.uk)

Published October 2024

DOI: [10.3310/WQJK9893](https://doi.org/10.3310/WQJK9893)

## Plain language summary

School-level variation in children's moderate to vigorous intensity physical activity before and after COVID-19: a multilevel model analysis

Public Health Research 2024

DOI: [10.3310/WQJK9893](https://doi.org/10.3310/WQJK9893)

NIHR Journals Library [www.journalslibrary.nihr.ac.uk](http://www.journalslibrary.nihr.ac.uk)

This article should be referenced as follows:

Salway R, House D, Walker R, Emm-Collison L, Breheny K, Sansum K, et al. School-level variation in children's moderate to vigorous intensity physical activity before and after COVID-19: a multilevel model analysis. [published online ahead of print October 2 2024]. *Public Health Res* 2024. <https://doi.org/10.3310/WQJK9893>

## Plain language summary

### What was the question?

Schools are important in helping children to be physically active. How active children are differs between schools. We wanted to know whether this has changed after the COVID-19 lockdowns. We also looked at features of the school, like equipment in the playground or being active in lessons, that might explain these differences.

### What did we do?

We collected activity data from 10- to 11-year-olds from 50 schools around Bristol (United Kingdom) before and after the COVID-19 lockdowns. Children also told us about how they travelled to school and whether they went to after-school sports or exercise clubs. We asked schools about their policies and lessons. Finally, we collected data on the playground and surroundings.

### What did we find?

In the first 6 months after lockdowns, schools had a much smaller role in children's activity. But after a year, schools were once again an important influence on how active children were. We found that the school features that affected children's activity had changed. Before the pandemic, the things that helped children most to be active were learning to ride a bike at school, and walking or cycling to school. After the pandemic, offering lots of after-school sports clubs was more important. Schools that struggled with physical education lessons because of a lack of space had fewer active pupils.

### What does this mean?

Schools continue to play an important role in helping children be active. But this role has changed after the lockdowns. In the future, schools could help keep children active by offering plenty of after-school clubs and help children to learn to ride a bike. Also, it is important to make sure that physical education lessons are a priority, even when there is not much space.