

Centre for Movement and Occupational Rehabilitation Sciences (MORes), Oxford Brookes University – Written evidence (NPS0106)

1. The Centre has at its heart a strong and dynamic research team that focuses on education and care with a clinical focus. The focus of research is nutrition, exercise, rehabilitation and movement science, and their role in the work environment. The Centre also provides a supported environment for research of young people and adults living with disability.
2. Over the past decade, MORes working closely with colleagues from the University of Oxford [Prof. Heidi Johansen-Berg, Director, Wellcome Centre for Integrative Neuroimaging and Dr Alexander Jones, Consultant Paediatric Cardiologist], has worked closely with adults and young people on health research projects including projects investigating associations between cardiorespiratory fitness, physical activity, health, mental health, cognition, academic attainment, and wellbeing more generally. The projects use a mix of observed and assigned study designs. The knowledge and evidence gained from these projects forms the basis of our answers to the selected 'Call for evidence' questions set out below. We have chosen to focus our response on 1) school setting | adolescents | physical literacy and 2) active living with long term conditions and multimorbidity.

In this response we provide a number of recommendations for the Committee's consideration. Further detail is provided later in this submission, but our top three recommendations are:

- The national plan for sport and recreation incorporates the regular monitoring of children and young people's levels of cardiorespiratory fitness, and physical activity.
- School physical education lessons are re-designed to increase levels of physical activity, specifically in terms of vigorous physical activity.
- More needs to be done to better promote the benefits and practice of increasing adolescent physical activity and fitness. We consider school is the most suitable setting for this to be achieved. Further work should be supported to identify, document and disseminate examples of best practice in schools.

Question 2. How can children and young people be encouraged to participate in sport and recreation both at school and outside school, and lead an active lifestyle? If possible, share examples of success stories and good practice, and challenges faced.

3. We believe that in order to answer this question, policy and decision makers first need to be made more aware of the current situation of children and young people's mental and physical health, both in terms of levels of fitness (cardiorespiratory and strength-related) and levels of physical activity. Education should start at an early stage to explain the benefits of leading an active lifestyle and taking care of the body. It doesn't matter how exercise is achieved, but children and young people should be more actively encouraged to exercise, as it will change the trajectory of their lives for the better. It

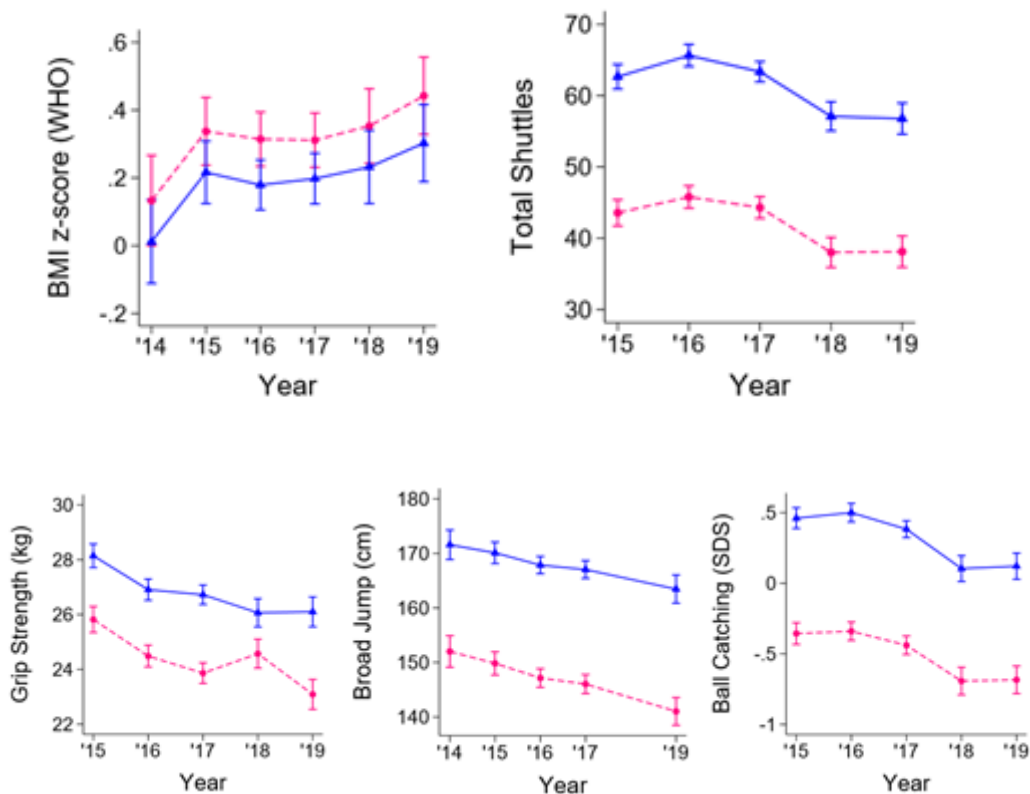
should become the accepted norm, not something to aim for from a low base, or later in life.

4. Inconsistent evidence exists for chronic physical activity-related effects on cognitive-, academic-, and brain outcomes. The field needs to refocus its efforts towards improving study quality, transparency of reporting and dissemination, and is urged to differentiate between intervention characteristics, for its findings to have a meaningful impact on policy. [1]
5. Over the past six years, MORes has undertaken a number of large-scale and representative health-related research projects in state primary and secondary schools. One aim was to set new and clear benchmarks of performance, and assess these against current guidelines, for both fitness and physical activity, and alongside other factors (e.g. motivation, mental health status) known to affect these levels. The challenges faced are reflected in our findings, which are summarised below. The main messages are highlighted in **bold**, followed by some referenced data to support the statements.

- **Pupil aerobic fitness is still in decline; we have also observed a decline in strength, power, endurance and other measures related to motor coordination.**
- **The total hours of taught PE lessons in secondary schools is in decline.**
- **Current PE lessons are very inactive compared to UK guidelines.**
- **<45% of adolescents in the UK meet the current government MVPA guidelines (Sport England Active Lives Survey 2018), and the situation is worse (based on objective data from 100 schools).**
- **A focus on vigorousPA (VPA) could have more direct fitness benefits than the current focus on MVPA (although monitoring and reporting of MVPA is limited).**
- **Pupils that enjoy school PE are fitter than their counterparts, and this relationship does not vary with sex.**
- **Future initiatives to encourage participation in sport and recreation should consider activities that are both enjoyable and a vigorous intensity. Our data supports that children need to run to benefit cardiovascular fitness.**
- **Children and young people that find sport difficult, can be encouraged to participate in school PE - if recruited within school and supported by directed provision.**

- i) In comparison with **current** global normative values, for both boys and girls, our study in 100 schools found average cardiorespiratory fitness was marginally higher with 51% of boys, and 54% of girls above the 50th percentile [2] ('Fit to Study', www.fit-to-study.org, Year7, n=10,697). These findings should be considered alongside the known decline in fitness in recent decades; although the rate of decline is stabilising, our longitudinal data (n=1,600, measured by the bleep test) suggests that **pupil fitness is still in decline.**

We are also observing (n=2,650) a **decline in other measures related to fitness and motor coordination**, e.g. grip strength, broad jump and ball catching.



Figs. Estimated marginal means and 95% confidence intervals of health-related fitness measures for adolescent's aged 13-14 years from 2014 to 2019. The solid blue lines and triangles represent boys and the pink dashed lines and circles represent girls.

- ii) Most young people in the UK have to attend school, and PE lessons are compulsory until Year 11, suggesting that school PE offers a suitable setting to promote adolescent PA and fitness. Worryingly, the **total hours of taught PE lessons for secondary school (11-17 years old) students has declined by over 15%** in the last decade [3].

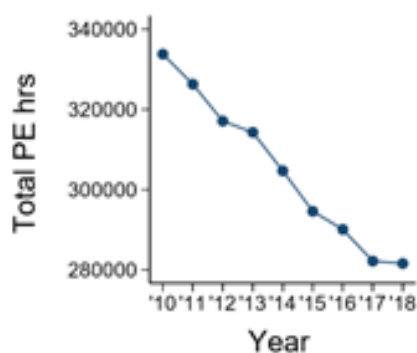


Fig: The total hours of taught PE lessons for secondary school (11-17 years old) students from 2010 to 2018. PE = Physical Education, hrs = hours.

- iii) To compound the reduction in PE lessons hours, **current PE lessons are very inactive compared to UK guidelines**; in the 'Fit to Study' project, not a single lesson we monitored (across 90 schools and 18,261 pupils) achieved 30 minutes MVPA per hour of PE. The lesson average MVPA was

only 23.8% (compared to the recommended 50-80% of lesson time), and sedentary time was 44.3%; less than 1% of pupils monitored achieved the 30 minute MVPA threshold. This data is worrying, when considered in the context of low PA over the rest of the week in the UK and that for most young people PE is the most active period of the week.[2]

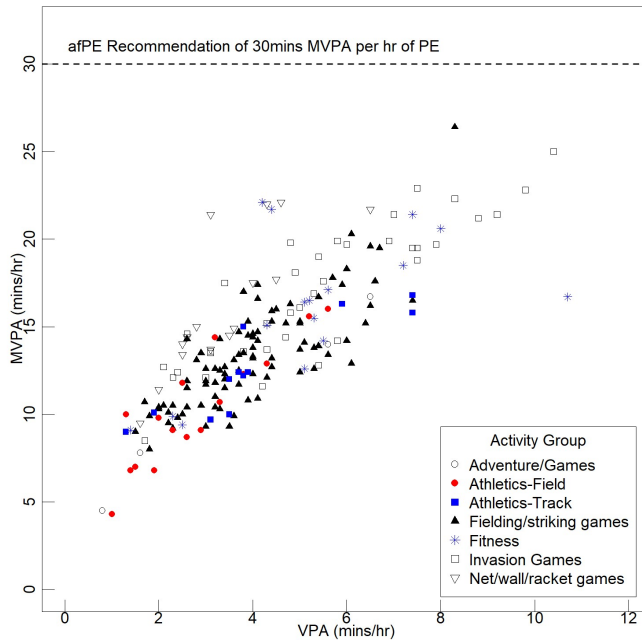


Fig. Grouped scatter of lesson average MVPA by lesson average VPA by activity group

- iv) It is reported (Sport England Active Lives Survey 2018) that just 43.2% of adolescents in the UK are meeting current government activity guidelines, which suggest accumulating at least 60 minutes MVPA per day across the week. Our objective data, collected across a number of our studies (n=500), suggest the situation could be worse, as we recorded **under 30% of pupils meeting the MVPA threshold.**
- v) Moderate vs Vigorous PA. MVPA levels in childhood are known to be critical for the healthy development of metabolic, cardiovascular and musculoskeletal systems. However, our work suggests that moving **more focus to VPA could have more direct cardiovascular fitness benefits than focusing solely on monitoring and reporting MVPA.** By looking at the duration of daily physical activity levels compared to cardiorespiratory fitness levels in adolescents, our recent analysis [awaiting submission] indicates that pupils who achieve a certain threshold of daily minutes of VPA are more likely to have above average cardiorespiratory fitness. Moderate PA in contrast was unrelated. This data supports the urgent need to increase vigorous PA in order to improve cardiovascular fitness. Further analysis is required on the impact of training [study underway] and the impact of moderate PA on metabolic health. MVPA was linked to obesity supports this latter statement.

- vi) **Pupils that enjoy school PE are fitter than their counterparts, and that this relationship does not vary with sex.** Further work is required to confirm cause and effect, but looking at this result in isolation, could indicate that schools should prioritise the joy of exercise and movement over high intensity. However, given the current very low levels of intense activity we have measured in PE lessons, and the known positive relationship between higher intensity and improved fitness, **future initiatives to encourage participation in sport and recreation should include activities that are both enjoyable and of high intensity.** [2]
- vii) A major challenge will be to engage those pupils that most need to improve cardiorespiratory fitness and their levels of physical activity. Pupils eligible for free school means (an indicator of socioeconomic status) are less likely to participate in PE and in fitness-based activities. We have also shown that pupils from schools located in areas of low deprivation record higher levels of fitness compared to pupils in schools located in high areas of deprivation. We have shown class location and activity type could be associated with the intensity of PA in PE. Considering that outdoor activities are more active, having appropriate school grounds and facilities is very important. [4]

Our work has also demonstrated that **children and young people that find sport difficult, can be encouraged to participate in school PE - if recruited within school and supported by directed provision in school.** For example, we have implemented adapted programmes to support exercise in local schools, which is now being used by the Iranian Ministry of Education to support Physical Education. [5]

Question 3. How can adults of all ages and backgrounds, particularly those from under-represented groups, including women and girls, ethnic minorities, disabled people, older people, and those from less affluent backgrounds, be encouraged to lead more active lifestyles? If possible, share examples of success stories and good practice, and challenges faced.

6. Over the last 15 years our research has shown that people with disabilities can and do engage in physical activity in the community. Results from the 'Long-term Fitness Enablement' study[6] found a barrier centre around opportunity (perceptions of programs/ facilities not being appropriate for them) and capability (knowledge of what they should be doing and knowledge of professionals to support them). Following this research, we conducted trials of self-directed community exercise for people with long-term neurological conditions and found that after an initial induction, largely un-supervised exercise was safe and well adhered to[7] and produced sustained benefits to motor symptoms in Parkinson's Disease (PD) for a year.[8]
7. An example of how to engage people with long-term disabling conditions to manage their physical activity is the Parkinson's UK First Steps Program.[9] First steps was conceived by people with PD to provide information and empower self-management for those newly diagnosed. Early interventions are important! The charity is rolling it out across the UK.

8. An example of a success story is the GO active physical activity care pathway in Oxfordshire. GO active was commissioned by Sport England in 2014 for the general sedentary population. Working with Active Oxfordshire and local authority partners, the pathway is appropriate for those with chronic disabling conditions. The subsequent evaluation of the pathway found it was effective at increasing physical activity and quality of life in those with chronic disabling conditions. Since the implementation of Go active there has been an increase in those with chronic disabling conditions being active in Oxfordshire: (2017: 46.1% active, 2018: 50.1% active). This equates to 46,349 with disability people in Oxfordshire in 2018 being active and the county having the lowest rates of inactivity in this group in England (34.8% compared to the national average of 44%). Subsequently Oxfordshire CCG commissioned the pathway for people with diabetes.
9. A challenge faced is having adequate training for those providing physical activity in the community so they have the confidence to support people with disability (and people with disabilities have the confidence in them). To address this we have developed National Occupational Standards (NOS D522) and a training course for exercise professionals.

Question 4. Sporting Future: A New Strategy for an Active Nation, the Government's 2015 sports strategy, outlines five outcome priorities: physical health, mental health, individual development, social and community development and economic development. Are these the right priorities and how successful has the government been in measuring and delivering these outcomes to date?

10. We agree fully with the choice of priorities, but they should not be considered or tackled in isolation. From large-sample cross-sectional studies, we have demonstrated the associations between physical activity, fitness, socio-economic status and mental health in adolescents, although further work is required to establish directionality (cause and effect). The current baseline levels, and the relationships between fitness and physical activity, have been discussed in our answer to Question 2.
11. Cardiorespiratory fitness as well as physical activity are linked to adolescent mental health. If effect direction is established, fitness monitoring could complement physical activity measurement when tracking public health. Our work has shown that higher levels of moderate to vigorous physical activity are associated with fewer internalising (emotional) symptoms, and that this relationship is stronger for boys than girls. Higher cardiorespiratory fitness is also linked to fewer internalising symptoms. The effects of physical activity and fitness on externalising (behavioural) symptoms are smaller but also significant. In our modelling, active lifestyle factors explained 27.0% of variance in mental health factors, characterised by high loadings for positive attitudes to activity and habitual activity, and for physical self-esteem and global self-esteem.[10,11]
12. Interventions to improve mental health and wellbeing should include efforts to promote positive attitudes to physical activity and increase long-term, regular activity behaviour that leads to greater fitness in young people. We are

unaware of any school-based national programmes that routinely measure the outcome priorities listed, and certainly not in combination.

Question 9. What successful policy interventions have other countries used to encourage people of all ages, backgrounds and abilities to participate in sport and recreation, and lead more active lifestyles?

13. We think there is learning from other countries. For example, our research is being used by the Iranian Ministry of Education to support Physical Education. Prof. Dawes has delivered training materials that were incorporated into Shad (<https://www.shad.ir/>), the online learning platform used by Iranian schools and watched by 46,000 people live and available to 14 million users. The Deputy Minister of Education advised these materials be used to increase physical activity.

Question 10. Should there be a national plan for sport and recreation? Why/why not

14. Our research shows that a physically active lifestyle is linked with systems-level brain MRI metrics, these results suggest widespread associations relating to several biological processes. These results support the notion of close brain-body relationships and underline the importance of investigating modifiable lifestyle factors not only for physical health but also for brain health early in adolescence. [12]

15. We would support a national plan for sport and recreation, but for that to be of maximal benefit, first we need to get our children and young people 'moving'. This will require education reform, supported by initiatives that work and are sustainable, backed-up by national monitoring programmes, including feedback of information to pupils, parents and teachers. We think there is learning from other countries [refer to our answer to Question 9].

16. A first priority is to address the decline in fitness and physical activity, as part of (or in parallel to) a national plan for sport and recreation. Currently our society is set up to encourage laziness, apathy and poor diet! We would support a national campaign to address these challenges, but within it an individualised and fully inclusive approach, empowering the children and young people who need it most.

17. Any future activity action plan or exercise interventions should include monitoring of fitness, movement / physical activity, mental health etc, ideally with strong links to teaching and early education on the benefits of maintaining fitness and regular activity, and monitoring through the early life course.

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