Sefydliad Gweithgaredd Corfforol, Iechyd a Chwaraeon Cymru

Welsh Institute of Physical Activity, Health and Sport

Annual Report 2021

Contents

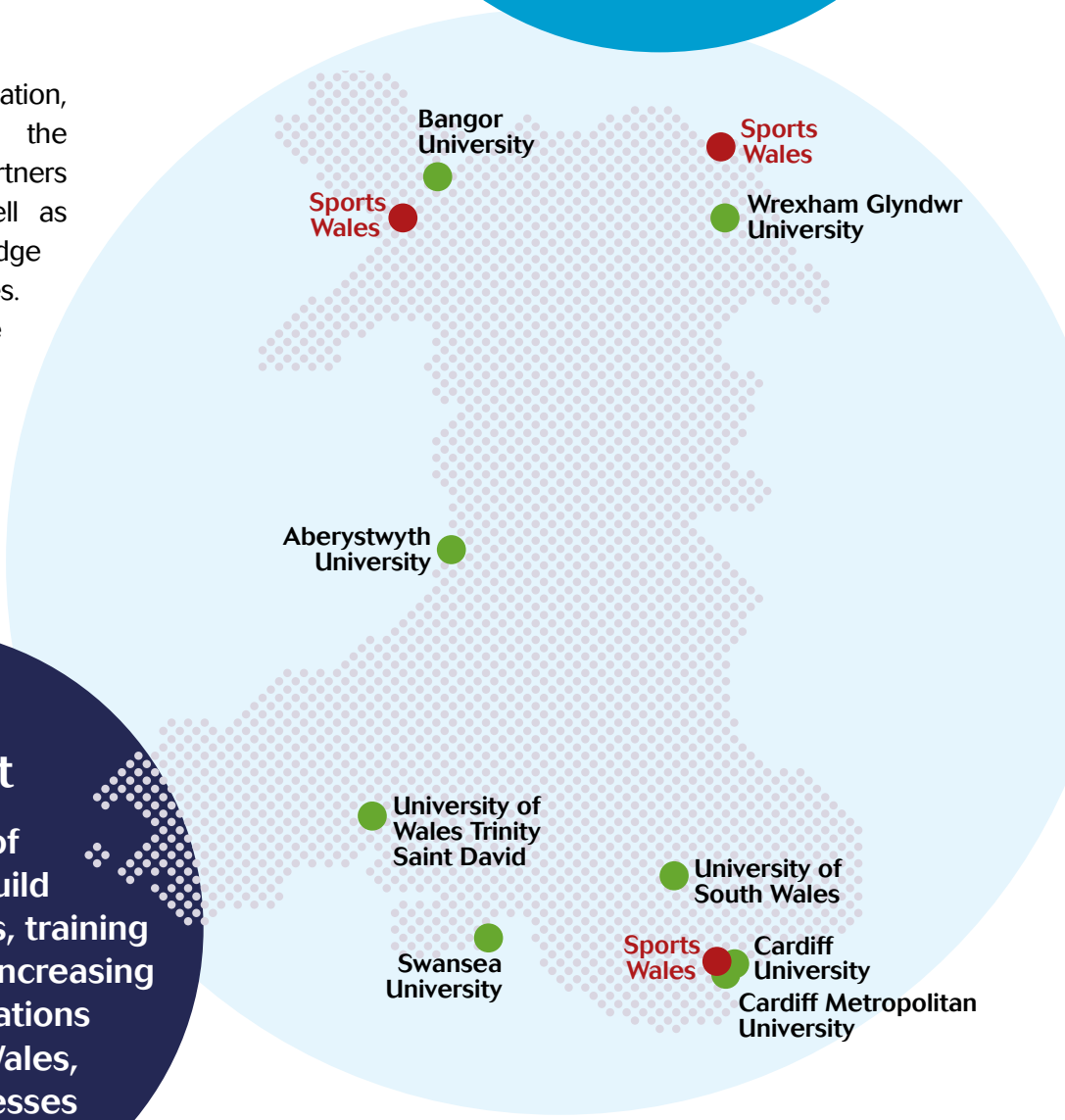
What does the Welsh Institute of Physical Activity, Health and Sport Aim to Achieve?

The Welsh Institute of Physical Activity, Health and Sport (WIPAHS) is a pan-Wales network of all eight Welsh Universities and Sport Wales. With members based across Wales, we can capitalise on the nation's unique culture and its remarkable range of expertise and industry. WIPAHS brings together world-leading academics, with representatives from Sport Wales and Welsh Government, who are driven to answer practice-based questions, identify fundamental research questions, and ensure that findings are reflected in Welsh policy and practice.

Purpose Statement

The purpose of WIPAHS is to facilitate the active involvement of key audiences in the identification of important research questions related to health and well-being of the nation's future generations and to co-design research strategies to address them.

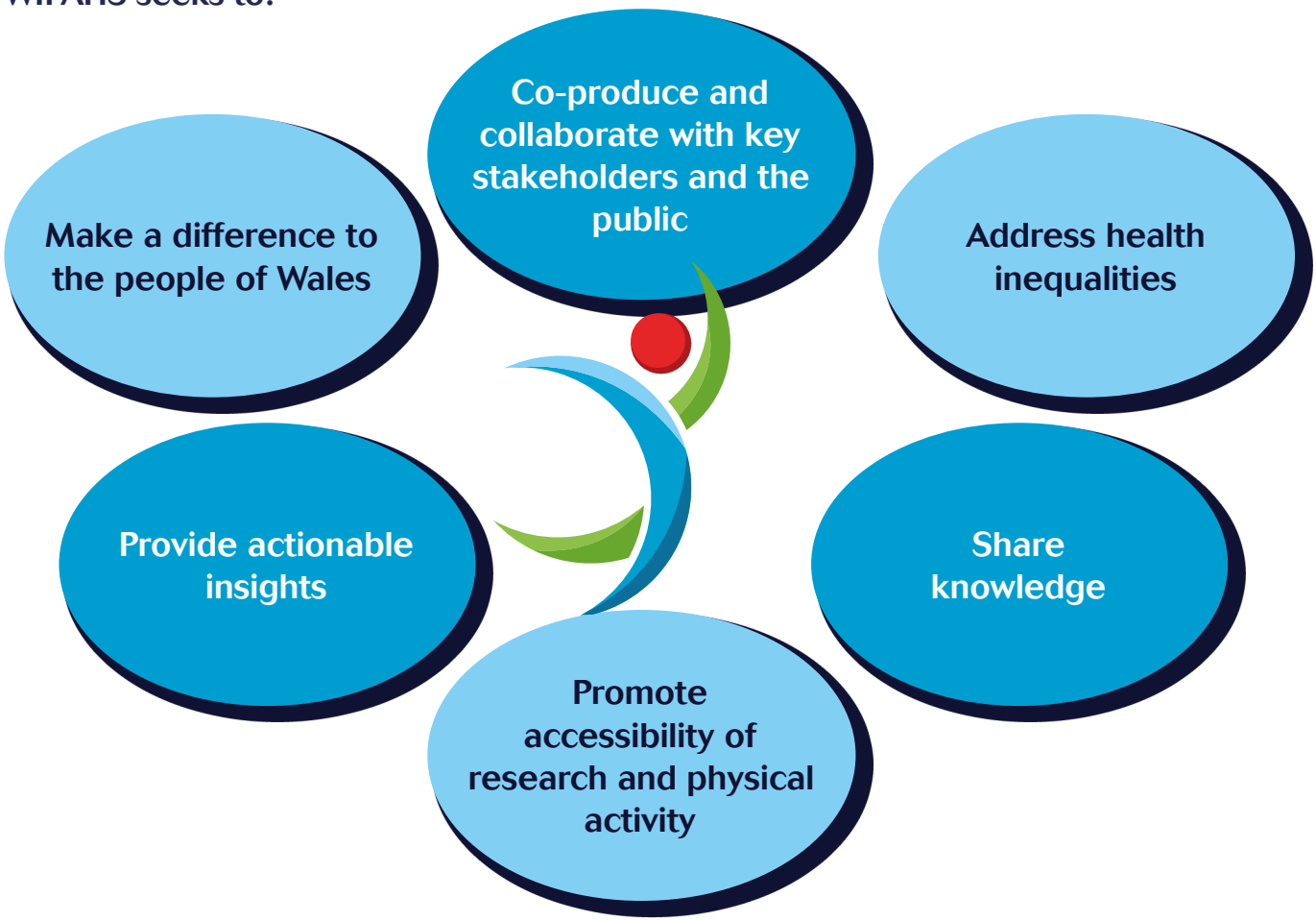
As a practice-driven organisation, WIPAHS seeks to answer the questions raised by partners working in the field, as well as widely disseminate knowledge across a range of audiences. WIPAHS seeks to use the transformative power of physical activity and sport to improve the lives of people in Wales.



Mission Statement

The mission of WIPAHS is to build capacity across Wales, training future scientists and increasing strategic collaborations between Sport Wales, academic, businesses and stakeholders.

When WIPAHS was established, six primary value-driven actions were identified to support the population of Wales through consultation with key partners. Specifically, WIPAHS seeks to:



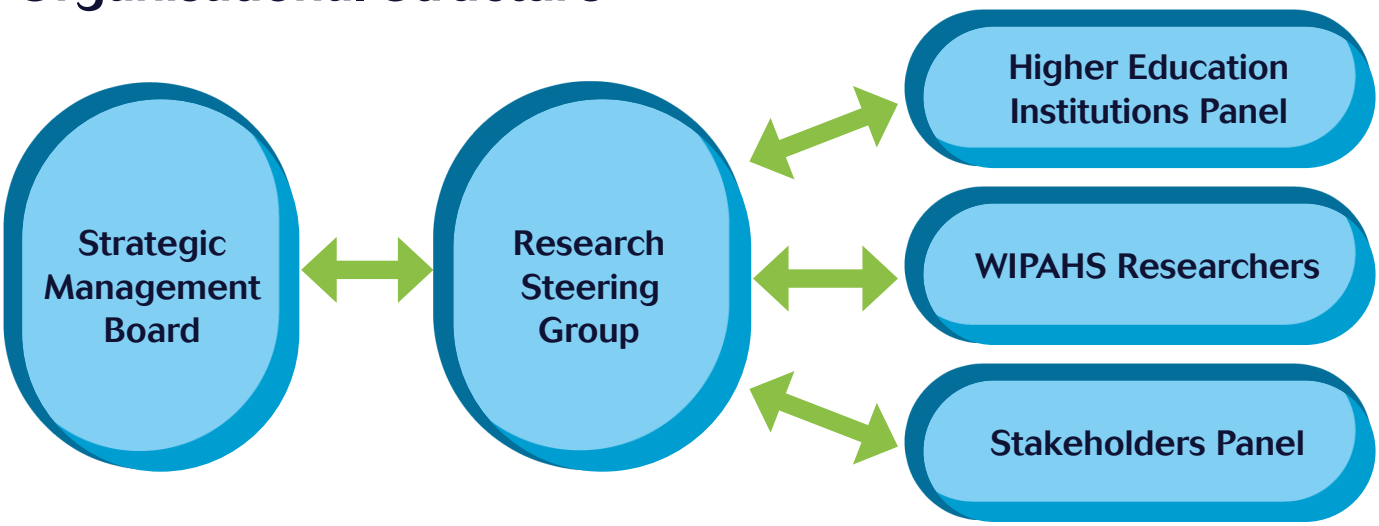
In line with the Well-being of Future Generations (Wales) Act (2015), WIPAHS embodies the five ways of working (i.e. long-term, integration, involvement, collaboration, and prevention). Specifically, WIPAHS strives to work collaboratively, with a long-term, forward-facing lens, to answer key practice-informed research questions and produce findings that can be widely shared in an accessible format.

By working pan-Wales, we hope to reduce the duplication of research through the facilitation and encouragement of collaboration across institutes and sectors and thereby to enhance the sharing of knowledge. Furthermore, to ensure that evidence derived from Wales is internationally recognised and influences international policy and practice, WIPAHS has become a member of the Health Enhancing Physical Activity (HEPA) Europe which is a European network for the promotion of health-enhancing physical activity.

This report provides an overview of WIPAHS, the work undertaken during 2021, and how WIPAHS can support stakeholders in Wales to consider research and insight opportunities.

International Presence: WIPAHS became a member of the Health Enhancing Physical Activity Europe (HEPA Europe) to support an international agenda to achieve the United Nations Sustainable Development Goals.

Organisational Structure



Strategic Management Board

Role: To provide overall strategic direction for WIPAHS in line with Sport Wales' strategy.

Co-chairs:

Prof Kelly Mackintosh (Swansea University)

Mr Owen Hathway (Sport Wales)

Members:

Prof Melitta McNarry (WIPAHS Research Director, Swansea University)

Mrs Fiona Cunnah (Welsh Government)

Prof Liam Kilduff (Chair of Welsh Institute of Performance Science Strategic Management Board, Swansea University)

Lead WIPAHS Researcher (Dr Catherine Sharp)

Research Steering Group

Role: To provide leadership and oversight of projects undertaken by WIPAHS.

Chair:

Prof Melitta McNarry (Swansea University)

Members:

Six Strategic Theme Leads

Lead WIPAHS Researcher

Sport Wales Representative (Mr Steffan Berrow)

WIPAHS Team


Prof Kelly Mackintosh
Swansea University


Mr Owen Hathway
Sport Wales


Prof Melitta McNarry
Swansea University


Dr Catherine Sharp
Lead WIPAHS
Researcher


Prof Liam Kilduff
Swansea University


Mr Steffan Berrow
Sport Wales


Dr Britt Hallingberg
Cardiff Metropolitan
University


Prof Nicola Gray
Swansea University


Mrs Fiona Cunnah
Welsh Government


Mrs Katherine Cullen
Swansea University


Dr Kelly Morgan
Cardiff University


Dr Richard Metcalfe
Swansea University


Prof Joanne Hudson
Swansea University


Dr Rhys Thatcher
Aberystwyth University


Dr Jamie Macdonald
Bangor University


Prof Diane Crone
Cardiff Metropolitan
University


Dr Liba Sheeran
Cardiff University


Prof Gareth Stratton
Swansea University


Dr Sharon Wheeler
Wrexham Glyndwr University


Mr Paul Rainer
University of South Wales


Dr Nalda Wainwright
University of Wales
Trinity Saint David

Appointment and Role of Strategic Theme Leads

In our previous annual report, we published our six strategic themes, all of which consider the promotion of mental and physical health and investigate how to implement and scale interventions.

To drive the strategic themes forward, Strategic Theme Leads were appointed in March 2021 through a competitive process. Their role is to seek and support projects with their academic expertise, to facilitate and enhance collaboration across organisations in Wales, and raise awareness of WIPAHS.

The current Strategic Theme Leads and the areas they are responsible for are as follows:

The **Healthy Lifestyles Theme** focuses on understanding how behaviours important for health (e.g. alcohol use, diet and sleep) occur together, alongside physical activity and how they might present in different contexts. As individuals often engage in a combination of both health-promoting behaviours as well as risky health behaviours, this theme focuses on taking a holistic view of our actions that contribute to our health in the development and evaluation of interventions.

Dr Britt Hallingberg
Healthy Lifestyles Strategic Theme Lead
Cardiff Metropolitan University

The **Mental Health and Well-being Theme** is focused on improving the state of people's well-being. This involves improving how people feel (e.g. feeling happy and content) and their behaviour and their ability to achieve their goals. This theme seeks to assist organisations to support the development of positive mental health as well as to identify ways of improving poor mental health.

Prof Nicola Gray
Mental Health and Well-being Strategic Theme Lead
Swansea University

The **Health, Sport and Physical Activity Economics Theme** is focused on understanding the economic impacts of improving access and engagement with health, sport and physical activity in Wales. This theme focuses on the inclusion of economic outcomes (e.g. resource use, productivity, health-related quality of life and well-being) into research to strengthen evidence for investment.

Mrs Katherine Cullen
Health, Sport and Physical Activity Economics Strategic Theme Lead
Swansea University

The **Population Level Change Theme** focuses on helping to understand how factors such as physical activity levels, sport and exercise participation and health inequalities change over time. This theme is focused on supporting organisations to identify existing datasets, develop data capture tools or analysis plans to assess whether change has occurred within and across populations.

Dr Kelly Morgan
Population Level Change Strategic Theme Lead
Cardiff University

The **Moving for Health Theme** is focused on investigating the effects of different types and amounts physical activity on different aspects of physical and mental health across the lifespan. The overall aim of this theme is to better understand how to optimise physical activity interventions and recommendations for the prevention and management of chronic diseases.

Dr Richard Metcalfe
Moving for Health Strategic Theme Lead
Swansea University

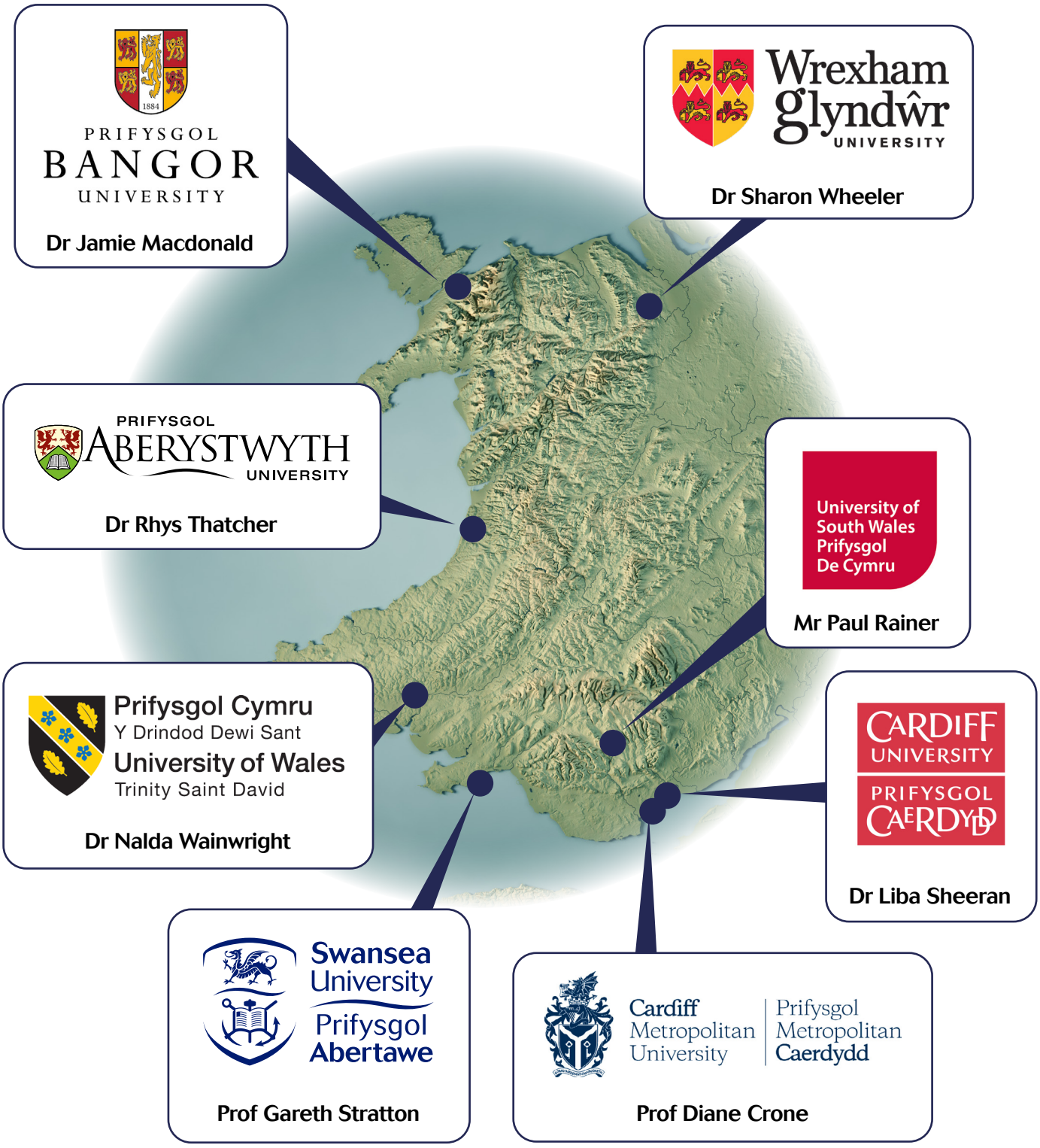
The **Behaviour Change Theme** is focused on helping to understand how to optimise people's engagement in healthy behaviours (e.g. being physically active) and to minimise people's engagement in unhealthy behaviours (e.g. smoking). This theme is focused on supporting organisations to identify factors that will influence people's behaviours and interventions that can be used to positively change their behaviours.

Prof Joanne Hudson
Behaviour Change Strategic Theme Lead
Swansea University

Higher Education Institutions Panel

To enable WIPAHS to work at a pan-Wales level, a representative from each of the eight universities in Wales is part of the wider WIPAHS network. The role of the Higher Education Institutions (HEIs) panel is to support WIPAHS by facilitating and enhancing connections and collaborations through the identification of researchers in their institution with expertise to contribute to projects, acting as a conduit for the sharing of opportunities and knowledge in both directions (e.g. WIPAHS to HEI and vice versa).

Each university has unique assets to contribute, and the HEIs Panel champions their contribution to ensure work is undertaken in an efficient and cost-effective manner. Our HEIs Panel includes:



WIPAHS Researchers

Committed to training future scientists in Wales from postgraduate level and beyond, we have talented early career researchers and research students supporting our research projects. Being a researcher affiliated to WIPAHS is a great opportunity for early career researchers and research students to experience applied research and see first-hand the impact their research can have on society. For more information see Case Study: Policing in Wales Group.

To support the work of WIPAHS, the following researchers have been employed and/or commissioned over the course of the reporting year to deliver projects – each researcher has been hyperlinked to an example output:

- Dr Rhiannon Willmot
- Dr Liezel Hurter
- Dr James Shelley
- Dr Sheree McCormick
- Miss Safia Ouerghi
- Dr Catherine Sharp
- Dr Rachel Knight
- Dr Adam Runacres
- Dr Nick Cavill

Stakeholders Panel

Organisations and individuals who approach WIPAHS with project ideas are central to the refinement, development and undertaking of the project. Ensuring the stakeholder voice is present throughout the project ensures that a multi-disciplinary approach is taken to the project, and and that the outcomes are applicable and translatable for the organisation/individual.

Operational Structure

WIPAHS is a reactive and proactive research and evaluation network, which means that we are required to operate in different ways depending on the specific project and associated timescales. To illustrate one approach WIPAHS might apply to a project, we have presented the following diagram. The closed loop nature of the diagram is to illustrate that WIPAHS also learns from itself, and knowledge from one project can inform other projects.

Example of Recent Projects

During January to December 2021, WIPAHS has led or contributed to more than 10 projects ranging from a local to national scale. This has included reviewing existing evidence to provide consensus reports to stakeholders, developing systems maps, providing novel insights through the collection of data with children and young people, and those experiencing long-COVID, updating physical activity factsheets and many more. We have also contributed to policy-related work such as the Active Healthy Kids 2021 Report and provided oral presentations and written evidence to the Senedd. The learning has been shared at national and international conferences, such as the International Society of Behavioural Nutrition and Physical Activity and Paediatric Work Physiology and fed through appropriate channels to support organisations' responses as we progress out of the pandemic.

Impact of the COVID-19 Pandemic on Sedentary Time and Behaviour in Children and Adults

Adam Runacres[1], Kelly Mackintosh[1], Rachel Knight[1], Liba Sheeran[2], Rhys Thatcher[3], James Shelley[1], Melitta McNarry[1]

[1]Swansea University, [2]Cardiff University, [3]Aberystwyth University

1. What is the problem being addressed?

To help control the spread of the COVID-19 disease, countries across the world implemented varying degrees of 'lockdown'. These lockdowns limited people's movement and their ability to engage in physical activity, potentially increasing sedentary time (time spent sitting or lying down) and having a negative effect on their health. This work aimed to develop a better understanding of the impact of the COVID-19 pandemic on sedentary time and health outcomes.

2. What research was conducted?

We searched the scientific literature for research which had examined sedentary time during the COVID-19 pandemic and found 1,601 articles. On careful examination of each of the articles, and excluding those which did not meet our criteria, we included 64 articles in this review and 40 articles provided data for a meta-analysis (where we examined the data for overall trends). For the analysis, the articles were placed into one of three groups: children (<18 years), adults (18-64 years) and older adults (>65 years). The average sedentary time for each group was calculated considering country, sedentary behaviour type, and health outcomes.

3. What was identified?

Out of the three groups, the group most affected by the restrictions were children. While children had an increase in daily sedentary time of over two and a half hours, adults and older adults had an increase of just over two hours and three-quarters of an hour, respectively. The data indicated that there were no differences in sedentary time between the sexes; this was true in all age groups. This would suggest that boys/men may have been impacted to a greater degree by lockdown as pre-pandemic it would be expected that they would have had lower sedentary time than girls/women. The only type of sedentary behaviour measured consistently was screen time, which accounted for 46.8% of total sedentary time in children and 57.2% in adults. In relation to health outcomes, increases in sedentary time were associated with reductions in global mental health, depression, anxiety and quality of life, irrespective of age.

The lockdown measures used to control COVID-19 had a greater impact on sedentary time in boys/men than it did in girls/women, and children were more negatively affected than both adults and older adults. As lockdowns begin to ease in the United Kingdom, strategies are needed to re-engage children in physical activity.

Example outputs from the work

- Runacres A, Mackintosh KA, Knight RL, Sheeran L, Thatcher R, Shelley J, McNarry MA. Impact of the COVID-19 Pandemic on Sedentary Time and Behaviour in Children and Adults: A Systematic Review and Meta-Analysis. Int J Environ Res Public Health. 2021 Oct 27;18(21):11286. doi: 10.3390/ijerph182111286.

Moving Forward: Understanding the Relationship between Physical Activity and Sedentary Behaviour during COVID-19 in Adults

Rachel Knight[1], Melitta McNarry[1], Liba Sheeran[2], Adam Runacres[1], Rhys Thatcher[3], James Shelley[1], Kelly Mackintosh[1]

[1]Swansea University, [2]Cardiff University, [3]Aberystwyth University

1. What is the problem being addressed?

Population-level estimates of physical activity and sedentary behaviour (time spent setting or lying down) highlight a significant public health issue that has been made even worse by the restrictions put in place to control the spread of COVID-19. Given the rarity of pandemics and the varied national and international approaches to its containment, we had little idea how such restrictions would impact people's lifestyles and health. To help understand the effects, it is important to explore the influence at many different levels and in different settings, including individual, social, and physical environments, and relevant policies. Taking this approach allows us to determine which conditions need to be met to support effective behavioural change at an individual- and population-level which is essential to inform the response of policy makers and intervention designers hoping to increase physical activity and decrease sedentary behaviour levels to improve population health.

2. What research was conducted?

A review of the 64 articles identified from a thorough search of the literature was undertaken to i) establish the impact of the COVID-19 pandemic on physical activity and sedentary behaviour across multiple levels and settings; and ii) identify mechanisms of behaviour change and make recommendations to inform future physical activity intervention strategies and policy following the COVID-19 pandemic.

3. What was identified?

A multicomponent model of the factors influencing physical activity during the pandemic was developed (Figure 1) and mapped to evidence-based models of behaviour change mechanisms. The model revealed different factors which have an influence over five levels:

1. Individual (biological) – general health;
2. Individual (psychological) – mental health, cognition, motivation, behaviour;
3. Social – domestic situation, sociodemographic factors, support, lifestyle choices;
4. Environmental - resources, area of residence; and
5. Policy – COVID-19-related rules.

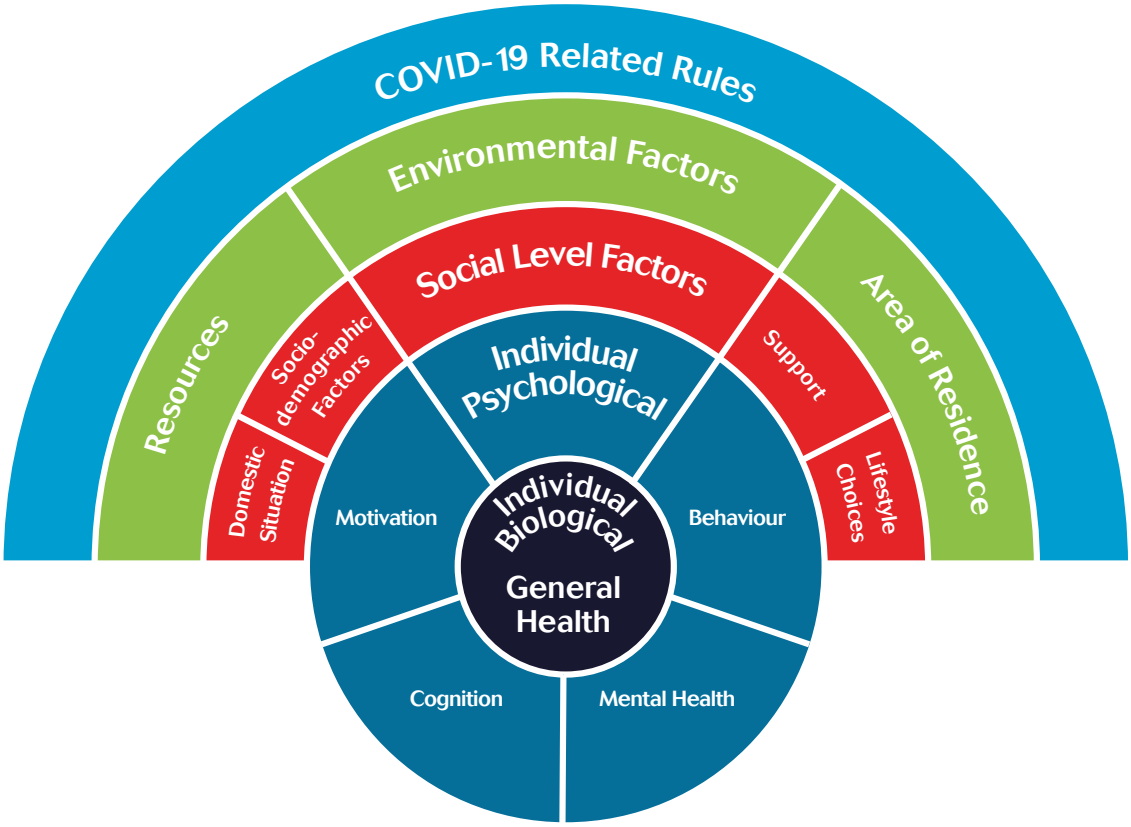


Figure 1. Model of variables associated with physical activity during the COVID-19 pandemic

For sedentary behaviour, individual-level factors, namely general and mental health, may be important correlates. Unlike before the COVID-19 pandemic, neither age nor sex were clearly correlated with physical activity or sedentary behaviour.

As we move into a new normal, understanding which behaviour mechanisms could effectively challenge physical inactivity is essential. Targeting capability on a psychological level may help increase physical activity levels and limit sedentary behaviour, whilst on a physical level, maximising opportunities to take part in physical activity behaviours could be crucial.

Example outputs from the work

- Knight RL, McNarry MA, Sheeran, L, Runacres A.W, Thatcher R, Shelley J, Mackintosh KA. Moving forward: Understanding correlates of physical activity and sedentary behaviour during COVID-19—An integrative review and socioecological approach. Int. J. Environ. Res. Public Health 2021, 18, 10910. doi: 10.3390/ijerph182010910

Moving Forward: Understanding Correlates of Physical Activity and Sedentary Behaviour during COVID-19 in Children and Adolescents

Rachel Knight[1], Melitta McNarry[1], Adam Runacres[1], James Shelley[1], Liba Sheeran[2], Kelly Mackintosh[1]

[1]Swansea University, [2]Cardiff University

1. What is the problem being addressed?

When the COVID-19 pandemic was declared, countries around the world used strategies such as school closures, cancellations of sports events and the introduction of social distancing to control the spread of infection. We do not know the impact of the restrictions on children and young people in the short- or long-term as they grow into adults. However, it is possible that the restrictions further exacerbated the already low physical activity levels of children and young people, 8 in 10 of which did not meet the recommended physical activity targets prior to the pandemic. We know that there are many factors that influence how physically active (or not) children and young people are, such as their age, sex, their family set up, where they live, and how physically active their family and friends are. The knowledge gained provides a framework for the development of interventions to reduce physical inactivity during lockdowns and to help with preparation in the case of any future pandemics.

2. What research was conducted?

This study systematically assessed all research papers published during the COVID-19 pandemic investigating the pandemic and associated restrictions on the physical activity and sitting levels of children and young people worldwide. We firstly identified the main factors affecting physical activity and sitting (e.g. child's age, sex, personality, their family set up, where they lived and also COVID-19 rules in place and secondly) and then how they impacted (positively or negatively) the physical activity and sitting of children and young people.

3. What was identified?

What we found was that during the pandemic, age or sex had little impact on how much or how little children engaged with physical activity but sitting time did increase in older children during lockdown. Figure 2 provides an outline of the socioeconomic model of factors associated to children and young people's physical activity and sedentary behaviour during COVID-19. Solid lines show the correlates and pathways for which the strongest evidence was found, whilst the dashed lines show the correlates and pathways with weaker evidence.

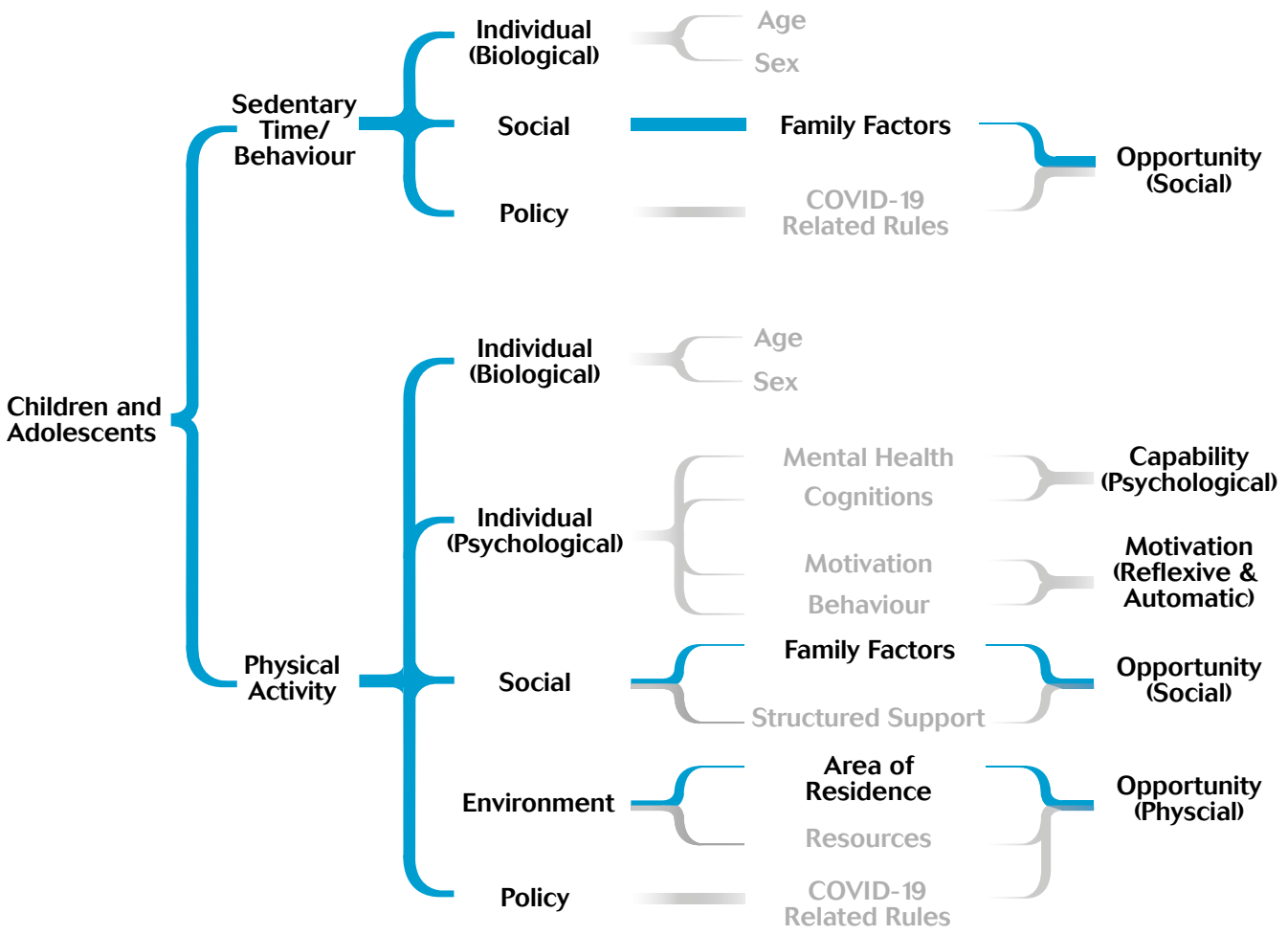


Figure 2. Outline of the socioeconomic model of factors associated to children and young people's physical activity and sedentary behaviour during COVID-19

COVID-19 protective measures including school closures and the associated hiatus in physical education classes and after school activities had pronounced negative impact on youth. Access to outside space or living in a house (as opposed to a flat) were important for younger children whilst loss of access to resource and sports facilities was the main barrier for teenagers being physically active. What helped teenagers to be physically active was their own sense of physical proficiency (e.g. fitness, strength), enjoyment, and motivation.

Mental health was also an important factor in teenagers, with poor mental health significantly impacting their physical activity during lockdown and vice versa. Family dynamics played a very important part, regardless of the age of the child. Encouragement from parents positively impacted physical activity of their children and teenagers, as well as parent's having control over their screen time. Indeed, the strongest positive factor associated with children and teenagers participating in physical activity was their parents joining in. Children and teenagers of parents whose work routines were relatively unchanged were associated with increased engagement in physical activity and less screen time. This indicates that maintaining a sense of 'normality' is likely to have a positive influence on the physical activity of children and teenagers.

Example outputs from the work

- Knight RL, McNarry MA, Runacres AW, Shelley J, Sheeran L, Mackintosh KA. Moving forward: Understanding correlates of physical activity and sedentary behaviour during COVID-19 in children and adolescents – an integrative review and socioecological approach. Int. J. Environ. Res. Public Health, 2022, 19, 1044. doi: 10.3390/ijerph19031044

'Future Gazing' for Sport Wales

Dr Nick Cavill, Cavill Associates Ltd

1. What is the problem being addressed?

Sport Wales sought to reflect and consider broad trends (e.g. societal, technological, digital) being observed in Wales and consider how these might influence sport and physical activity provision. This information was intended to feed into debate and discussion about how the public sector might respond and adapt to societal changes and needs. This desire to look ahead was also influenced by the 2020-2021 COVID-19 pandemic and associated lockdowns and restrictions, which had had significant impacts on sport and physical activity. This project sought to address the following broad questions in a rounded and flexible manner:

- What are the main societal, technological, digital, environmental, economic, demographic (and other) trends we are seeing which will impact on sport and physical recreation in the next 5-10 years?
- What has been the role of COVID-19 in changing/accelerating these trends?

2. What research was conducted?

Interviews were conducted with 16 individuals from varied backgrounds. While it was an important part of the project to talk to people involved in sport in Wales, it was also critical to engage people who saw the world from very different perspectives and not solely those directly involved in sport and physical activity provision. The list of interviewees included:

- Sport Wales employees
- A futures expert from the Office of the Future Generations Commissioner
- Academic experts including in global public health and the environment
- A CEO of a leading technology company
- WHO lead for physical activity
- A consumer of virtual reality physical activity technology
- A public health commentator
- A public sector leader of a community whole systems programme
- A town planner
- A global IT expert

In addition, Nick attended a seminar led by Steve Wells, a leading futurist, to develop thoughts and insight on global mega-trends, before focusing further on detailed areas with more direct implications for sport.

3. What was identified?

To support our understanding of the data, information and ideas generated, we created system maps. These system maps are used to portray complex situations, showing the connections between different issues (or themes, or even people). They are a way of showing how things are inter-connected. In this case, each circle is a brief description of an issue that is predicted to increase in the future. Each line shows how one increase might influence another. For example, increasing concerns over climate change are likely to lead to increasing concerns over air quality, which may in turn lead to young people travelling less. The overall system map created encompasses seven themes: economic, environmental, mega-trends, social, sport and activity, technology and transport. Figure 3 shows the systems map created. To view the interactive system map, visit here.

The systems map and associated report were used to stimulate internal discussion within Sport Wales about future planning and provision of sport for the next 10 years and beyond.

Example outputs from the work

- Sport Wales Future Gazing project. Discussion paper. Produced by Cavill Associates public health consultancy for Sport Wales.

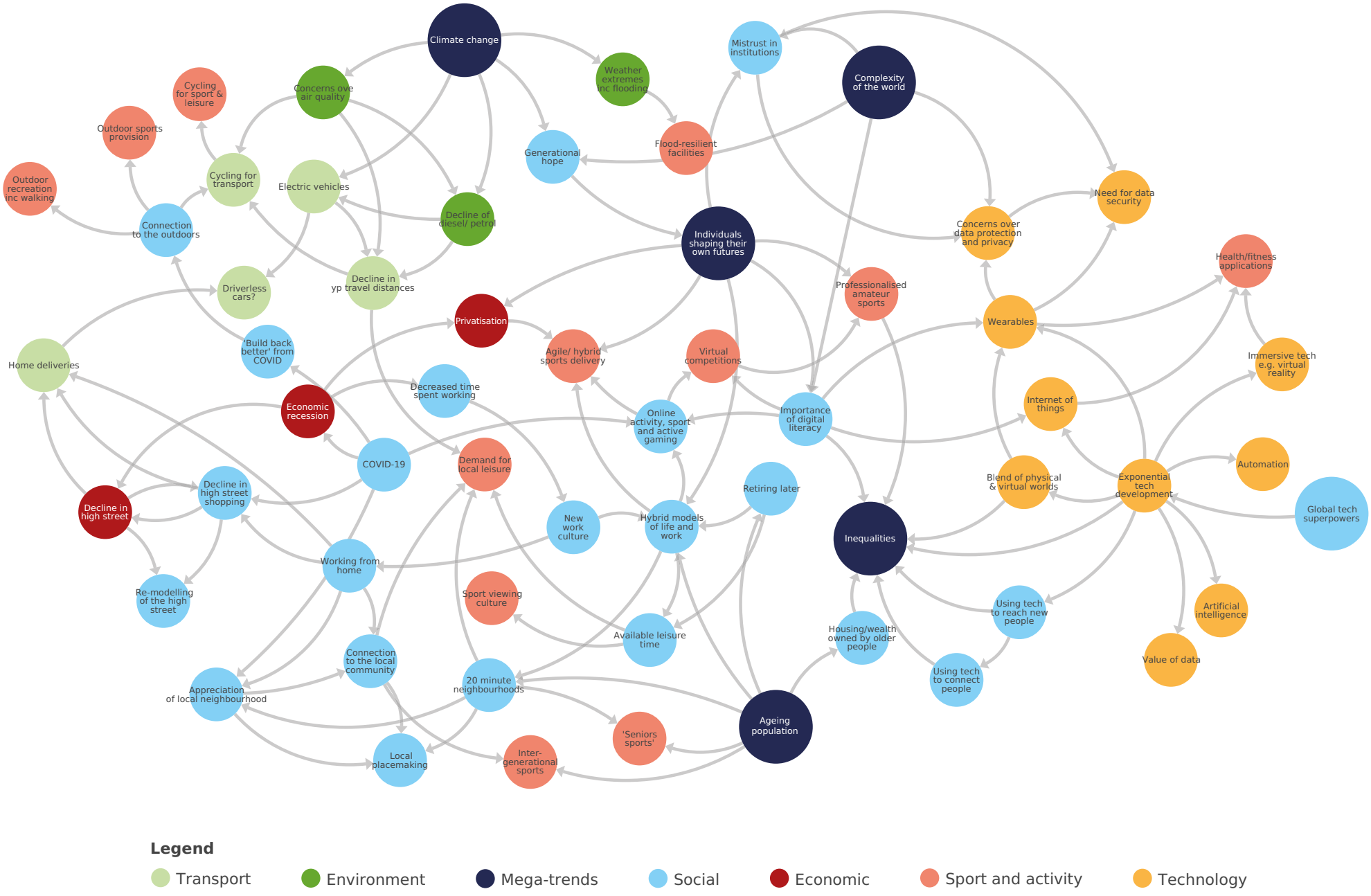


Figure 3. Systems map showing the seven key themes identified as trends which will influence sport and physical activity in the next 5-10 years

Inspiration for the Future: Training Respiratory Muscles to Improve Recovery from COVID-19

Melitta McNarry[1], Ronan Berg[2], James Shelley[1], Joanne Hudson[1], Zoe Saynor[3], Keir Lewis[4], Gwyneth Davies[1], Mark Williams[5], Jamie Duckers[6], Kelly Mackintosh[1]

[1]Swansea University, [2]University of Copenhagen, [3]University of Portsmouth, [4]Prince Philip Hospital, [5]University of South Wales, [6]University Hospital Llandough

1. What is the problem being addressed?

According to the NHS, 'long-COVID' is a disease characterised as experiencing symptoms for more than 12 weeks. Symptoms include breathlessness, extreme tiredness and tightness in the chest. We urgently need to identify safe and effective strategies of supporting recovery from long-COVID. However, our understanding of such strategies is limited. This project explored people's experiences of recovering from COVID-19 to give a better understanding of the short- and long-term impact of the disease on physical activity, and to investigate the potential rehabilitative role of strengthening the respiratory muscles (known as inspiratory muscle training). Inspiratory muscle training uses a device (Figure 4) to create a resistance to respiratory muscles, which improves muscle strength and endurance.

2. What research was conducted?

A total of 281 adults recovering from self-reported COVID-19 were randomized to an eight-week inspiratory muscle training group or a "usual care" control group. Four outcomes (breathlessness, respiratory muscle strength, fitness, and device-based physical activity) were measured before and after an intervention was delivered. Before and after the intervention started, 48 of the adults recovering from COVID-19 (6–11 months after becoming infected) were interviewed.

Figure 4. Device used to strengthen respiratory muscles

3. What was identified?

Four overarching themes were identified from the interviews:

1. Living with COVID-19, including managing activities of daily living;
2. Dealing with the unknown and self-management strategies;
3. Re-introducing physical activity; and
4. Challenges of returning to work.

The return to physical activity, whether through activities of daily living, work or exercise, was often connected with symptoms getting worse. This presents a range of challenges for individuals recovering from COVID-19. Support which is designed specifically for a person is therefore needed to address the unique challenges created by COVID-19.

Inspiratory muscle training led to improvements in breathlessness, fitness and feelings of competence. Improvements were also found in the strength of the respiratory muscles. Inspiratory muscle training improves recovery from COVID-19 and represents an important home-based rehabilitation tool that should be considered for wider implementation as part of COVID-19 rehabilitative strategies.

Example outputs from the work

- Shelley J, Hudson J, Mackintosh KA, Saynor ZL, Duckers J, Lewis KE, Davies GA, Berg RMG, McNarry MA. 'I Live a Kind of Shadow Life': Individual Experiences of COVID-19 Recovery and the Impact on Physical Activity Levels. Int J Environ Res Public Health. 2021 Oct 29;18(21):11417. doi: 10.3390/ijerph182111417
- McNarry MA., Berg RMG, Shelley J, Hudson J, Saynor ZL, Duckers J, Lewis J, Davies GA, Mackintosh KA. Inspiratory Muscle Training Enhances Recovery following COVID-19: A Randomised Controlled Trial. ERJ. 2022, 2; 2103101. doi: 10.1183/13993003.03101-2021
- Presentations at the following conferences:
  - European Respiratory Society
  - The Physiological Society
- Publicly accessible Webinar 1 and Webinar 2

The Impact of COVID-19 on the Physical Activity Type and Associated Attitudes of Adults in Wales

Liezel Hurter[1], James Shelley[1], Melitta A. McNarry[1], Kelly Mackintosh[1], Tim Evans[2], Owen Hathway[2]

[1]Swansea University, [2]Sport Wales

1. What is the problem being addressed?

The COVID-19 restrictions have had a significant impact on the populations ability to get involved in physical activity and sport, and on their health and well-being. Little is known about how the pandemic and restrictions have changed the type of physical activity individuals take part in and their attitudes towards physical activity. Therefore, this study explored the physical activity behaviours and attitude of adults in Wales during the pandemic, especially about the types and amount of physical activity they took part in and self-reported changes in their physical activity behaviours.

2. What research was conducted?

Sport Wales commissioned Savanta ComRes (a research consultancy) to survey a stratified sample of adults (16+ years) in Wales at three different time-points during the pandemic. The first nationwide survey was completed by 1,007 adults during the first national Welsh lockdown (May 2020), when all people were advised to stay at home. The second survey was completed by an independent sample of 1,007 adults while there were local restrictions, but outdoor and indoor sport and leisure facilities were open (October 2020). A final third time-point with 1,011 adults was conducted when people were able to travel within their local area and outdoor sports facilities were open but indoor fitness centres and gymnasiums remained closed (March 2021).

3. What was identified?

"Walking for leisure" was the most common type of physical activity adults reported taking part in during all three stages of the pandemic. A total of 58% (first-), 61% (second-) and 64% (third time-point) of participants reported going for walks during the previous week. Of these, 52% and 42% from first and second time-points, respectively, said that this was more than they typically walked for leisure before the pandemic.

Participants who had the most freedom during the COVID-19 restrictions (second time-point) reported being the least active, while those surveyed during the national lockdown reported the highest levels of physical activity. During periods of strict restrictions, participants reported having more time for physical activity and exercise, which for some led to increased enjoyment and motivation for being physically active. During the lockdown, participants reported being more active than a typical week prior to the pandemic. However, the increased physical activity levels did not last. At the second time-point, most participants reported no change in activity levels as compared to pre-pandemic, while at the third time-point most reported that they were doing less physical activity compared to pre-pandemic. During the third time-point, 63% of participants reported that they intended to increase their physical activity levels once all restrictions were removed.

Results from this study showed that during a time when people's movement were less controlled by restrictions, physical activity levels were lower. The clear intention of people to increase their physical activity levels after the pandemic is a great opportunity for interventions and policies targeting population-level physical activity to have an impact.

The Impact of COVID-19 on Children in Wales' Physical Activity Levels, Mental Health and Well-being

Liezel Hurter[1], Kelly Mackintosh[1], Melitta McNarry[1], Denise Hill[1], Gareth Stratton[1], Owen Hathway[2], Catherine Sharp[1]

[1]Swansea University, [2]Sport Wales

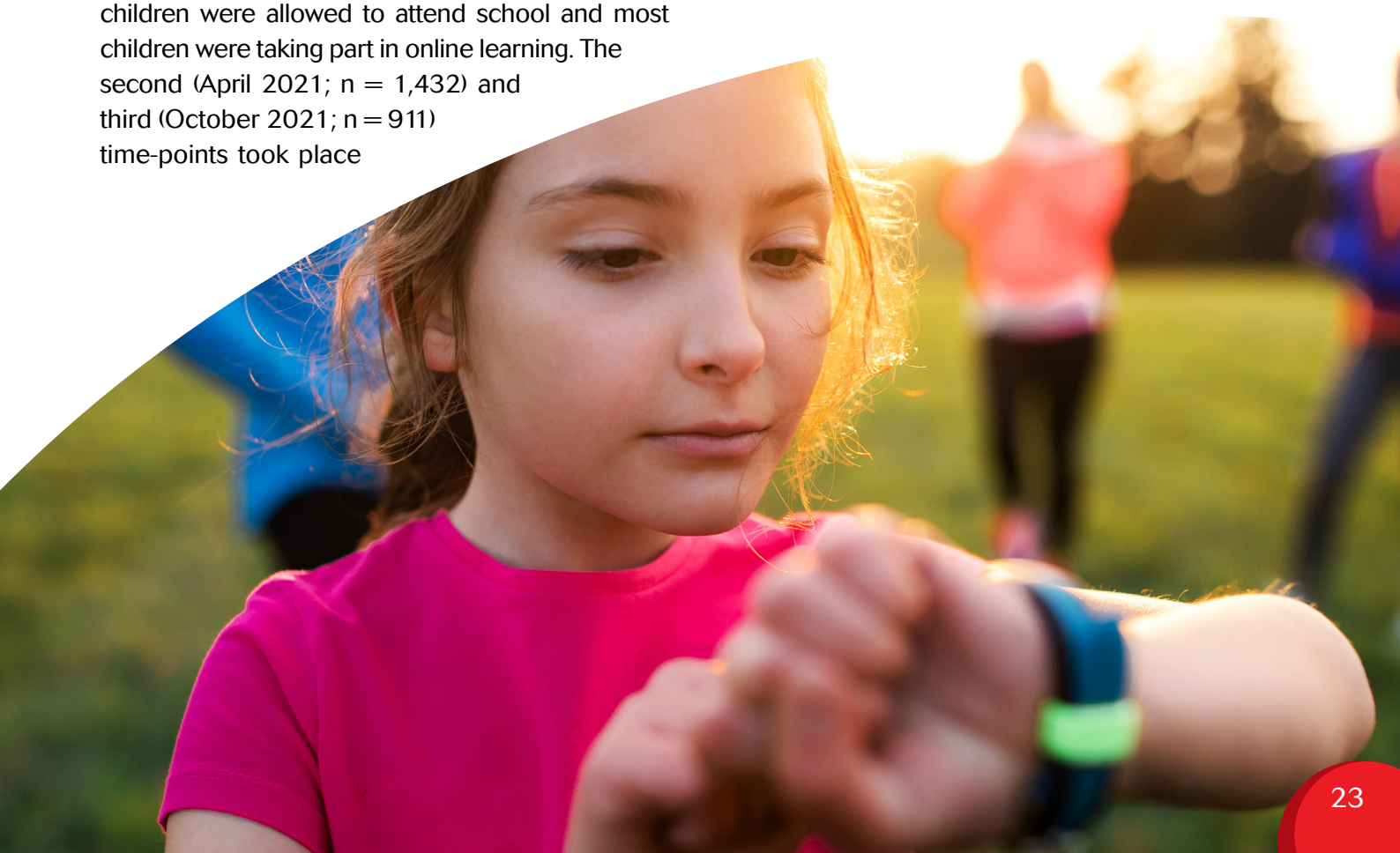
1. What is the problem being addressed?

COVID-19 lockdowns took away most opportunities for children to be physically active and to socialise with friends. Physical activity levels, mental health and well-being of children and young people have never been more at risk. The aim of this study was to determine the effect of the lockdown on children and adolescents' physical activity levels, their mental health and well-being.

2. What research was conducted?

To date, three data collection time-points have successfully been conducted, during which children (aged 8-18 years old) were asked to complete a survey about their physical activity levels and mental health and well-being. A smaller group of the sample were also asked to wear a physical activity monitor (Figure 5) at each time-point. The first time-point (January 2021) was during the national lockdown with 1,708 children, when only key workers' children were allowed to attend school and most children were taking part in online learning. The second (April 2021; n = 1,432) and third (October 2021; n = 911) time-points took place while all children were back in school. During each time-point, 800 children (stratified by sex, age and deprivation levels) wore activity monitors for seven consecutive days.

Figure 5. Monitor used to measure physical activity and sedentary behaviour



3. What was identified?

Physical activity levels were low during lockdown. Children only took part in, on average, 38 minutes of daily moderate-to-vigorous intensity physical activity (MVPA); only 14.7% of children met the Chief Medical Officers' recommended 60 minutes per day. Contradictory to data before the pandemic which generally showed that boys engaged in more MVPA than girls, during lockdown, there were no significant differences between boys' and girls' levels of MVPA. However, once all children returned to school, the usually observed sex differences were reinstated with boys again engaging in more MVPA than girls. Survey results showed that boys utilised break- and lunchtimes at school to be active, as their physical activity scores from those times were significantly higher than those of girls.

It was also revealed that physical activity declined with age across all time-points, and upon return to school younger children were more active during school break- and lunchtimes. Upper secondary school girls (years 10 to 13) were identified as a highly inactive group in need of post-COVID intervention, as upon return to school only 9% reached the recommended guidelines. Children's well-being scores increased significantly upon their return to school and continued to increase the longer they stayed in school. As with physical activity levels, well-being scores declined with age across all time-points.

Qualitative results from open-ended questions during the lockdown survey revealed that the majority of children reported a negative psychological response at this time-point, which predominantly included sadness, anger, stress/anxiety/fear, loneliness, boredom and laziness. However, a small number of the participants identified experiencing a positive psychological response, due to feeling safe at home, having a supportive home environment and or being away from school.

This is envisaged to be a longitudinal study with the fourth time-point conducted in March 2022.

Example outputs from the work

- Hurter L, McNarry MA, Stratton G, Mackintosh K. Back to school after lockdown: The effect of COVID-19 restrictions on children's device-based physical activity metrics. J. Sport Health Sci. 2022. doi: 10.1016/j.jshs.2022.01.009
- Presentations at the following conferences:
  - International Society for the Measurement of Physical Behaviour
  - International Society for Behavioural Nutrition and Physical Activity
  - Pediatric Work Physiology - Dr Liezel Hurter was 1 of 6 finalists for the Best Early Career Researcher Presentation Award
- Publicly accessible webinar

Did Online Training Platforms Promote Overtraining during the COVID-19 Pandemic?

Richard Metcalfe[1], Melitta McNarry[1], Liezel Hurter[1], Kelly Mackintosh[1]

[1]Swansea University

1. What is the problem being addressed?

The stay-at-home restrictions and sustained closures of gyms and sports centres during the COVID-19 pandemic meant a remarkable number of people turned to online exercise platforms to exercise at home. For example, Zwift, one of the most popular platforms, reported a 300% uplift in activity during the pandemic. Although there are many benefits to these online platforms, the constant availability and ease of access may also present several risks.

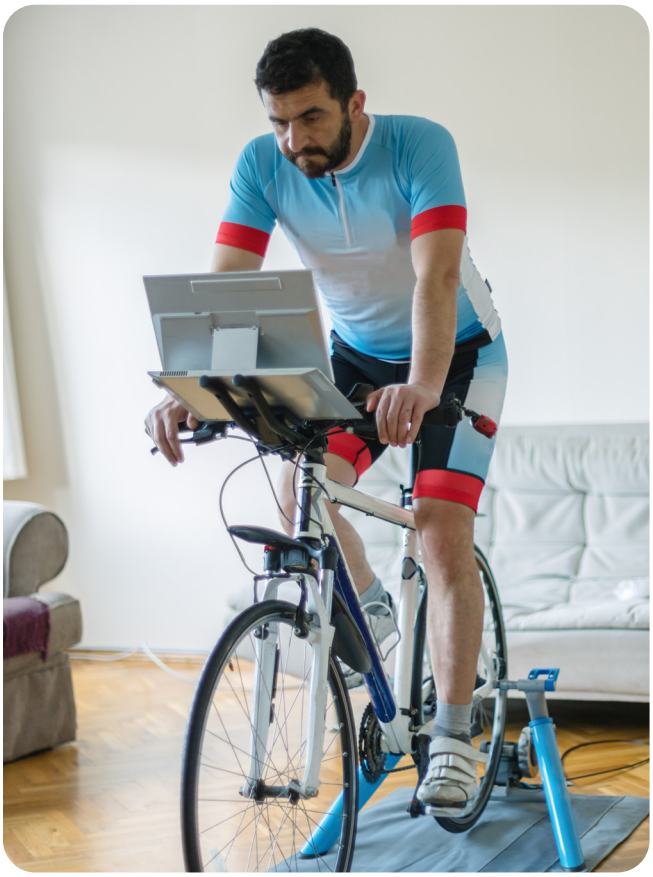
Successful training involves the combination of a sufficient amount and intensity of exercise to overload bodily systems with appropriate amounts of rest and recovery to allow those systems to adapt. However, if the amount of training relative to recovery is not appropriate, then an irregular training response may occur and, in extreme cases, may result in a condition called "overtraining syndrome" or "unexplained underperformance syndrome". Overtraining may result in lengthy decreases in performance lasting several weeks or months, alongside other symptoms (e.g. negative changes in mood). As a result, Welsh Triathlon wanted to assess whether the increased use of online exercise training platforms might have been leading to a higher prevalence of overtraining and overuse injuries.

2. What research was conducted?

68 members of cycling and triathlon clubs across Wales were surveyed retrospectively on their training habits and symptoms of overtraining and overuse injuries during winter 2020/2021.

3. What was identified?

Respondents reported an increase in their use of online exercise platforms, alongside the maintenance of their 'conventional' training habits. This suggested that total training volume may have been higher than would be typical. The survey



revealed a prevalence of symptoms of overtraining of 9%. Although this might seem high, comparisons with previous research suggest it is similar to what might be observed across a normal season in high level athletes. At the same time, 46% of respondents reported the presence of an injury over the survey period, with 23% reporting an injury that had resulted in time away from training (15% for >2 weeks). In a recent systematic review, the prevalence of overuse injuries over a typical season was 42% in individual sports and 33% in team sports. Thus, the prevalence reported in this sample is on the upper end of what might be expected. Together this research suggests that, although the use of online exercise training platforms increased, the prevalence of overtraining and overuse injuries was no higher than might otherwise have been expected.

Moving Out of the Pandemic: Capturing Sector Evidence and Recommendations for Behaviour Change

Sheree McCormick[1], Joanne Hudson[1], Safia Ouerghi[1], Kelly Mackintosh[1], Melitta McNarry[1]

[1]Swansea University

1. What is the problem being addressed?

The COVID-19 pandemic has had a huge effect on physical activity levels in 2020. Desk research in Phase 1 of this project showed that, for some, the lockdown helped to increase their physical activity levels (e.g. home working, more time available for exercise, fewer leisure time activities to choose from). However, for others, the lockdown was a barrier to their physical activity. Some of the reasons for this decrease in physical activity levels were identified as including:

- Fear of catching COVID-19;
- Self-isolating due to long-term health conditions;
- Restricted access to equipment;
- Lack of a competitive league; and/or
- Unsuitable home environment.

The challenge addressed within this research was to identify target audiences and behaviours to influence as a priority, and to offer targeted interventions to ensure that these individuals do not become further marginalised regarding physical activity and sport opportunities. In addition, such behavioural interventions should not influence the positive effects that the lockdown has provided to other individuals.

2. What research was conducted?

This project aimed to provide recommendations for behaviour change with respect to increasing public physical activity levels and participation in sport. This was done by synthesising and interpreting Phase 1 and Phase 2 evidence. Phase 1 work involved analysing existing evidence to identify themes relating to physical activity levels and sport participation during the pandemic, challenges faced, and opportunities presented in different physical activity and sport contexts.

Phase 2 work involved conducting seven online interviews, one focus group (two participants) and one email correspondence interview. All interviewees were involved in promoting/providing physical activity and/or sport before and during the initial COVID-19 lockdown in spring 2020 and subsequent lockdowns and fire-breakers in 2020-2021 in Wales. This was done to explore emerging Phase 1 themes in more detail.

3. What was identified?

Our findings showed that positive factors that influenced physical activity levels and sport participation during the COVID-19 pandemic included an uptake of online delivery of sport and an increase in sports performed from the doorstep (e.g. running and cycling). This increase was supported by the availability of rental of nextbikes/OVO bikes and governmental guidelines in which exercising locally was one of the few acceptable reasons individuals had for leaving the house during periods of strict lockdown. Negative factors challenging participation in sport and physical activity were recognised as including fear of catching COVID, overcrowding at popular recreational sites (leading to an increased chance of catching COVID), loss of volunteers and coaches, and closures of indoor sport facilities. Identifying these factors allowed us to provide recommendations to positively influence physical activity levels and participation in sport among members of the public in Wales (Figure 6). The Behaviour Change Wheel incorporates the COM-B (capability, opportunity, motivation-behaviour) behaviour change model and was used as a framework for the development of recommendations at provider, community, and individual levels, based on the project's findings. It is hoped that by adopting these recommendations, the lessons learned from the pandemic can be capitalised on to eradicate some of the barriers discussed and to allow sport providers to encourage individuals back to, or into, sports.

Figure 6. Provider and individual and community recommendations for behaviour change

An Audit of Policy in Wales to Explore the Inclusion of Physical Activity Actions in to Help the International Goal of Achieving the United Nations Sustainable Development Goals

Catherine Sharp[1], Kelly Mackintosh[1], Rhi Willmot[1], Rachel Hughes[2], Melitta McNarry[1], Karen Milton[3]

[1]Swansea University, [2]Dotiau Ltd & Wrexham Glyndŵr University, [3]University of East Anglia

1. What is the problem being addressed?

Population-level changes in physical activity may benefit from policy intervention. In 2015, the United Nations published the Sustainable Development Goals (SDGs) to be achieved by 2030. Welsh Government's response to the SDGs, at a national level, was to establish the Well-being of Future Generations (Wales) Act 2015 (WBFGA; Figure 7) to support achieving the international goals. At a sub-national level, the WBFGA created Public Service Boards (PSBs) to improve the translation of national policy into practice.

Figure 7. The Well-being of Future Generations Act Goals for Wales

2. What research was conducted?

An audit of policies published by national and sub-national public bodies between 2015 and 2020 was undertaken. The policies were reviewed, and information extracted to answer the following questions:

1. How many policies included a direct physical activity action;
2. What were the drivers in creating those policies;
3. What was the content of the physical activity actions; and
4. How the physical activity actions aligned with the WBFGA.

3. What was identified?

At a national-level, 16 documents were found to contain a direct physical activity action. These documents were published by 4 of the 13 public bodies bound by the WBFGA. The contents of the policies were inconsistent on the clarity and specificity of the direct actions, the assignment of clear roles/responsibilities and the settings of targets. At a sub-national level, 15 of 19 PSB well-being polices included a direct physical activity action. The audit of physical activity policies in Wales is a case study example of how policies can be connected across different levels to support their implementation, and other countries should consider adopting a similar approach.

Example outputs from the work

- Sharp CA, Mackintosh, KA, Willmot RA, Hughes R, McNarry MA, Milton K. National policy response to the Sustainable Development Goals: a physical activity case study of Wales. J. Phys. Act. Health, 2022, March 11. Doi: 10.1123/jpah.2021-0491

Example Projects Underway

We are currently supporting partners to address important research questions and produce resources to support increasing physical activity levels. More information on these projects will be available in our next annual report, however, short summaries are provided below to provide a flavour of the projects we will be working on in the coming year.

Physical Activity Factsheets for Practitioners

Co-ordinating the work, with further researchers invited to contribute to the factsheets: Liezel Hurter[1], Diane Crone[2], Melitta McNarry[1], Kelly Mackintosh[1], Catherine Sharp[1], Britt Hallingberg[2], Richard Metcalfe[1], Kelly Morgan[3]

[1]Swansea University, [2]Cardiff Metropolitan University, [3]Cardiff University

The role of physical activity in the prevention, management, and treatment of many physical and mental health conditions is well recognised. However, the information is not always easily accessible for practitioners and, where summaries have been created, they require updating to ensure they are in line with the most up to date evidence. Dr Brian Johnson, a GP passionate about promoting physical activity, was the original creator and driver of a range of factsheets for different conditions (e.g. mental health, cancer), and created factsheets in collaboration with a range of academics and practitioners across the UK. WIPAHS is now working with Dr Johnson and colleagues to update the factsheets to ensure they reflect recent evidence and guidance. These will be published in 2022 and hosted on WIPAHS and Health Education and Improvement Wales website.

Impact of Nordic walking on Adolescents' Health and Well-being Outcomes

Britt Hallingberg[1], Kelly Morgan[2], Katherine Cullen[3], Jamie Macdonald[4], Richard Metcalfe[3], Catherine Sharp[3]

[1]Cardiff Metropolitan University, [2]Cardiff University, [3]Swansea University, [4]Bangor University

There is no denying the benefits of walking on adolescent's health outcomes, however, when WIPAHS was approached regarding the effects of Nordic walking specifically on adolescents, a review of the literature found very little evidence in this population. The impact of Nordic walking has predominantly only been explored in the adult population. After identifying this gap and recognising the unique opportunity in Wales to use the outdoor space to improve adolescent outcomes, a project group has been formed consisting of researchers and an accredited Nordic Walking volunteer to begin exploring adolescents' perceptions of Nordic walking and what an intervention might look like to them. The findings of this project will be useful to schools as they integrate the new curriculum, specifically the Area of Learning, Health and Well-being.

Using Activist Methodology with Student-centred Enquiry to Develop Secondary School Grounds as a Restorative Environment to Support Adolescents' Mental Health and Well-Being

Nalda Wainwright[1], Andy Williams[1], Melitta McNarry[2], Kelly Mackintosh[2], Catherine Sharp[2], Britt Hallingberg[3], Liba Sheeran[4], Catherine Purcell[4], David Kirk[5], Cara Lamb[5]

[1]University of Wales Trinity Saint David, [2]Swansea University, [3]Cardiff Metropolitan University, [4]Cardiff University, [5]University of Strathclyde

A grant proposal is being developed by a team of researchers from WIPAHS and beyond to submit to an ESRC grant open call. Underpinned by the theory of salutogenesis, the aim of the project is to train and support school staff to use pupil voice to co-construct the outdoor environment and how it will be used for learning, recreation, and restoration. The project will produce a toolkit to support secondary schools in the development of their school grounds. With nearly 200 secondary schools in Wales and nearly 5,000 in the UK, this project has the potential to support the development of restorative spaces in all communities. If successful, the project will be conducted over a three year period, working in a large secondary school in Bridgend with support from a variety of partners.

Exploring the Landscape for Children to Participate in Organised Physical Activity and Sport in North Wales

Melitta McNarry[1], Catherine Sharp[1], Britt Hallingberg[2], Kelly Mackintosh[1]

[1]Swansea University, [2]Cardiff Metropolitan University

Working with Sport North Wales, we will explore what 'first experience' opportunities children have to participate in organised physical activity and sport across North Wales. This information will be used by partners to promote knowledge of opportunities to encourage children and families to take advantage of and consequently increase physical activity levels, but also identify gaps where further provision is needed.

Evaluation of Active Education Beyond the School Day

Catherine Sharp[1], Melitta McNarry[1], Kelly Mackintosh[1], Nalda Wainwright[2], Katherine Cullen[1], Gareth Stratton[1]

[1]Swansea University, [2]University of Wales Trinity Saint David

Sport Wales are piloting a programme called 'Active Education Beyond the School Day'. The programme involves opening school sport facilities beyond the traditional school day. This project will evaluate the Active Education Beyond the School Day programme to explore: (i) what enables a school to become an active education setting, (ii) what is the impact of a school becoming an active education setting, and (iii) what can ensure the active education approach becomes sustainable and embedded into school development plans.

Experience of Working with WIPAHS

"Sport North Wales is a collaboration of a number of disparate organisations, all with the aim of making a long term difference here in North Wales. We are still early in our regional partnership journey and our engagement with the WIPAHS network, but already, we recognise the value and expertise they bring to the table and we look forward to continuing to work with them as they support the development of a fit for the future outcomes framework for the Partnership."

Manon Rees-O'Brien, Regional Sport Director, Sport North Wales

"Welsh Triathlon had a research question around the move to static training platforms and potential overtraining as club athletes changed their training habits during the pandemic. An expression of interest to the WIPAHS group was answered quickly with an in-depth discussion meeting to discuss the perceived issues and facilitation and analysis of survey circulated via several National Governing Bodies to athletes likely to have changed habits. Since analysis and feedback from the project Welsh Triathlon have been able to support athlete queries around the use of static training platforms, indicate potential issue with injury and overtraining from an informed perspective. We are grateful to the WIPAHS team for a swift and comprehensive answer to our questions based on evidence-based research techniques."

Beverely Lewis, Chief Executive Officer, Welsh Triathlon

"As part of the support we (Sport Wales) have received from WIPAHS through the Active Education Beyond the School Day Evaluation, we have found the knowledge base and research advice invaluable. Interactions with the WIPAHS team have been engaging, thought provoking and informative. We have been guided through the research processes with integrity and professionalism (especially as not all of us working on the project are researchers). Furthermore, WIPAHS have outlined all the necessary steps, from the ethics proposal to the methodology and beyond. We are very much looking forward to seeing the final evaluation of this area of work."

Clare Roberts, Foundations and Participation Lead, Sport Wales

"Nordic Walking (derived from Cross Country skiing), uses specially designed poles to enhance your posture and walk. Nordic Walking has predominantly been delivered to adults, mostly over 50's, and there has been extensive research into a wide range of health conditions in adults and the benefit of Nordic Walking. However, we wondered why there was no young person's Nordic Walking groups in Wales, and realised that there had been no research into this unique activity for young people within the UK. Nordic Walking for adolescents would provide fitness preparation, improve their social and interaction skills, focus on technique, walking on the flat, uneven terrain and up and down hills in an outdoor environment, improving mental health and well-being.

We contacted WIPAHS and asked if there was an opportunity for their research team to look into a project for Nordic Walking and adolescents. WIPAHS agreed and was very keen to work together on this project. A focus group was set up and we are currently working together on scheduling delivery of Taster sessions of Nordic Walking technique to schools. Enabling us to get initial data to get early findings, and then be able to apply for research grant with the aim of incorporating Nordic Walking for adolescents in the school physical education curriculum. Working with WIPAHS will enable the team to carry out research studies and see how Nordic Walking can improve physical activity in adolescents. Especially by putting Wales at the forefront on the Research platform for Nordic Walking and adolescents."

Carol Ross, Celtic Nordic Walking Wales

Case Study: Policing in Wales Group

1. Why has the partnership been formed?

The partnership between the Policing in Wales Board and WIPAHS has been formed to support the work of the Offices of the Police and Crime Commissioners in Wales and the Policing in Wales Board in using physical activity, exercise and sport to help deliver against many of the objectives or pillars contained within Commissioners' Police & Crime Plans, particularly in relation to youth crime, serious crime and those who are most at risk of involvement in the Criminal Justice System.

The project is part-funded by the Offices of the Police and Crime Commissioners in Wales and the Knowledge Exchange Scholarship Scheme (KESS), European Social Fund. We are currently undertaking two related research studies, which are being carried out by two research students who are supported by WIPAHS experts and the Policing in Wales Board.

2. What are the benefits of the partnership?

The Policing in Wales Board (comprising the four Chief Constables and four Police and Crime Commissioners in Wales) has recently (March 2021) agreed that a Strategy for Sport and Physical Activity be developed, with a pan-Wales approach. The proposed programme of work and delivery of the project by WIPAHS, an all-Wales association, will help to establish the Strategy and contribute to its aims of cross-Wales working to achieve the goals of the Well-Being of Future Generations Act (2015).

This is the first time that evidence on physical activity, exercise, and sport-based initiatives from across Wales will be available, allowing us to gain an understanding of the pan-Wales picture to identify best practice across all four Forces.

3. What work is currently taking place?

KESS 1: A scoping audit of the use of sport and physical activity as a crime prevention tool across Police Forces and Police and Crime Commissioners in Wales

The first of these studies aims to conduct an audit of the current investments that are made by the Police and Crime Commissioners in Wales that focus on physical activity and sport projects as a crime prevention tool to help reduce the amount of young people entering the criminal justice system. This will also include initiatives not fully funded by the Police and Crime Commissioners but led by, for instance, charities and youth clubs that support young people.

WIPAHS academics who are leading this study are: Prof Joanne Hudson (Swansea University), Prof Melitta McNarry (Swansea University), Dr Owen Thomas (Cardiff Metropolitan University), and Dr Jamie Macdonald (Bangor University).

KESS 2: Criminal Youth Justice System in Wales' Alignment with Sports Providers and Identification of Readiness to Engage

The second study aims to explore the key projects for reducing youth crime through the medium of physical activity, exercise and sport in more detail. For example, the project will explore the desired outcomes from different initiatives, the delivery models and reasons for investment and disinvestment in different initiatives, via interviews with key deliverers and stakeholders across Wales.

WIPAHS academics who are leading this study are: Prof Joanne Hudson (Swansea University), Mrs Katherine Cullen (Swansea University), Dr Liba Sheeran (Cardiff University), and Prof Simon Moore (Cardiff University).

"This is an innovative and exciting project, the first of its kind and we are looking forward to the outcomes so that we can further develop policies and strategies for the use of sport as an effective diversionary method to help prevent crime, particularly where young people are concerned."

Mr Peter Curran
Project Lead, All Wales
Sport Strategy

"This is a great example of how WIPAHS can work with organisations to address key questions and advance our understanding of the current provision and its optimisation for the future. It is exciting to see everyone working together for the future health and wellbeing benefit of the nation."

Prof Melitta McNarry
WIPAHS Research Director

4. What are next steps for the partnership?

The next steps for the partnership are to develop recommendations from these projects and to implement and evaluate these. The partners are also working on developing projects aligned with the wider remit of the Policing in Wales Board, including supporting police workers' health and well-being.

Sefydliad Gweithgaredd Corfforol, Iechyd a Chwaraeon Cymru

Welsh Institute of Physical Activity, Health and Sport

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sportwales chwaraeoncymru

Prifysgol Bangor University

Prifysgol Aberystwyth University

Cardiff University Prifysgol Caerdydd

University of South Wales Prifysgol De Cymru

Prifysgol Cymru Y Drindod Dewi Sant University of Wales Trinity Saint David

Wrexham Glyndŵr University

Llywodraeth Cymru Welsh Government

kess2

Cronfa Gymdeithasol Ewrop European Social Fund

BASem

De Cymru Comisiynydd yr Heddlu a Throseddu Police and Crime Commissioner South Wales

Contact Us

If you would be interested in discussing how the Welsh Institute of Physical Activity, Health and Sport (WIPAHS) can assist your organisation to answer important research and evaluation questions, or help provide your organisation with important insight, please do not hesitate to contact us to discuss.

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