# OVERVIEW & ANNUAL REPORT

MARCH 2021

Sefydliad Cymru
Gweithgaredd Corfforol,
Iechyd a Chwaraeon

Welsh Institute
of Physical Activity,
Health and Sport

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# INTRODUCTION

In order to enhance the health, wellbeing and future of Wales, it is essential that our society is physically active. At the Welsh Institute of Physical Activity, Health and Sport (WIPAHS), we work to achieve this by identifying and answering key questions about the nation's health.

We bring together academia, those who are facilitating physical activity and sport, policy makers, and the public to facilitate this process. We are practice-driven, and so operate collaboratively to address the priorities and needs of those working in the field. Additionally, with members based across Wales, we are able to capitalise on the nation's unique culture and its remarkable range of expertise and industry.

Our team includes members from Sport Wales, Welsh Government, and all eight universities in Wales. This represents a multi-disciplinary network of expertise, which unites the experiences of practitioners with world-leading research. By uniting this diverse knowledge and experience, we are able to generate high-quality, impactful and novel insight.

We also strive to translate research into practice, by generating actionable insights that practitioners can apply in context. As a Pan-Wales organisation, we are well-placed to disseminate research findings and in a manner that informs practice and policy, and enhances knowledge-sharing across Wales and beyond.

This report serves to introduce the objectives, structure and development of WIPAHS, following our establishment.

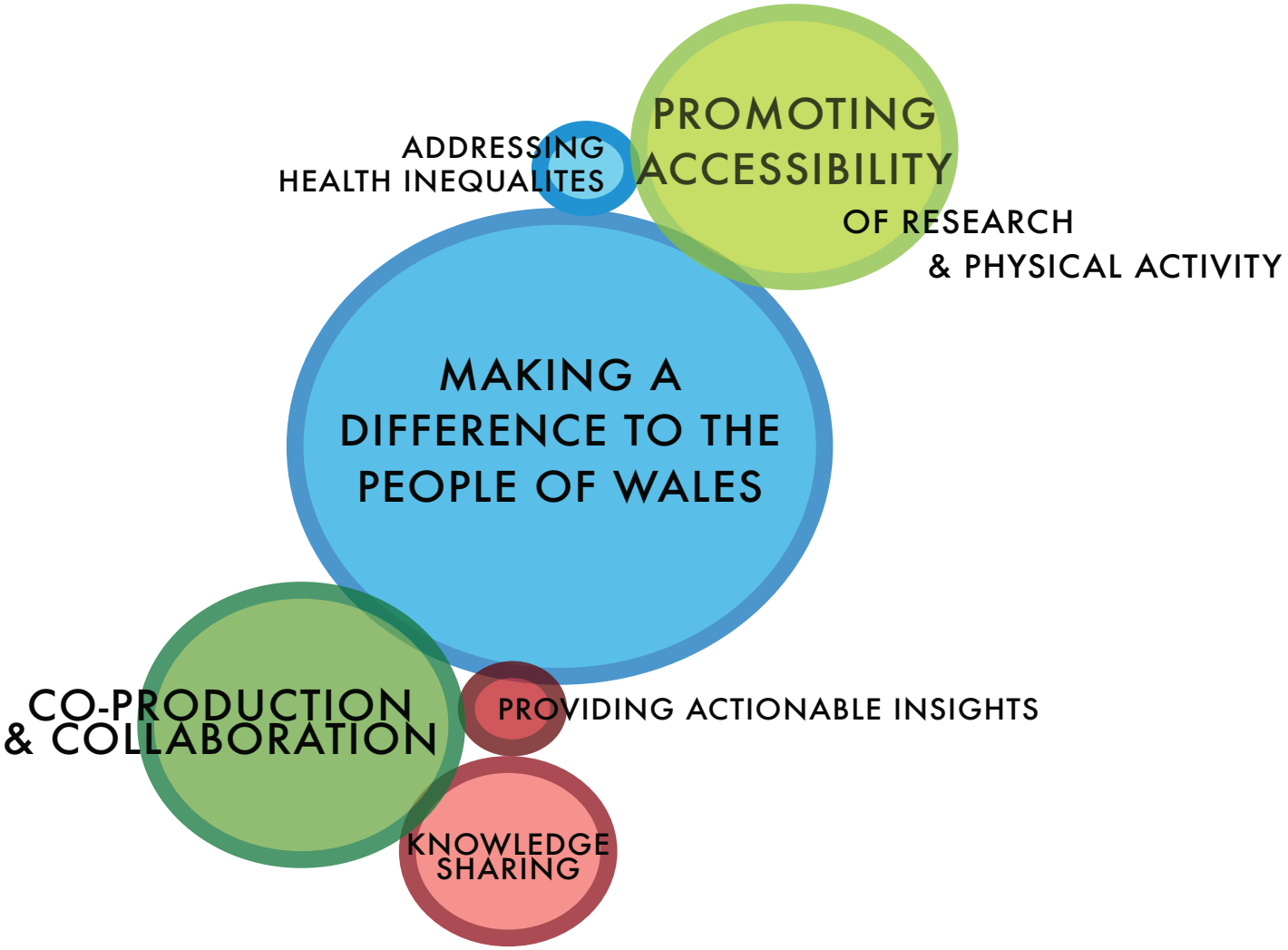
## *PURPOSE STATEMENT*

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

## *MISSION STATEMENT*

The mission of the Welsh Institute of Physical Activity, Health and Sport is to build capacity across Wales, training future scientists and increasing strategic collaborations between Sport Wales, academia, business and stakeholders.

# VALUE-DRIVEN ACTIONS



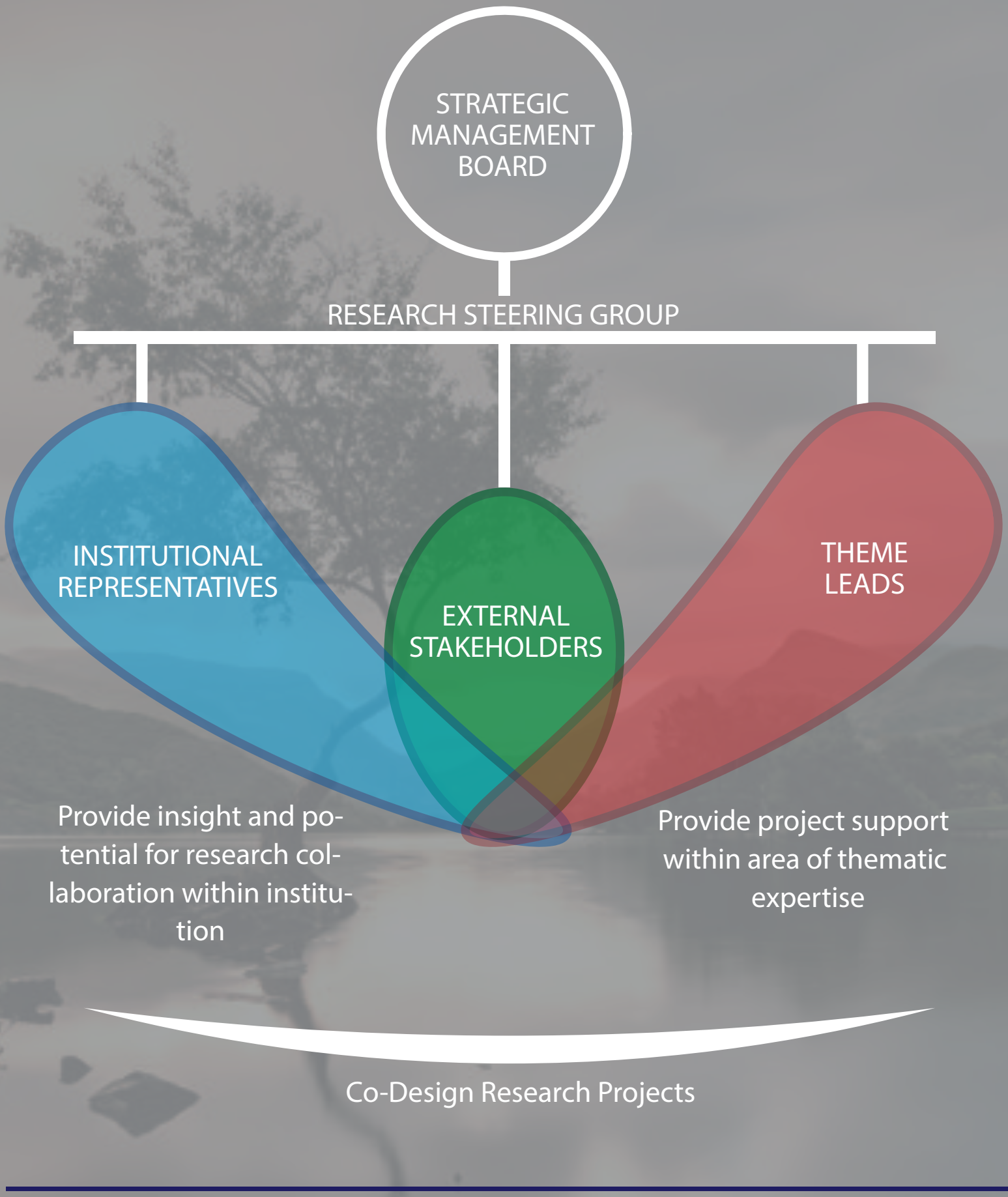

As a practice-driven organisation, our academic team operate to answer the questions posed by external stakeholders working in the field. Our primary goal is to make a difference to people living in Wales, by conducting collaborative and co-designed research.

We also strive to enhance the accessibility of our findings, by disseminating them widely and to audiences who can impact policy and practice.

We aim to address some of the most critical issues surrounding physical activity, health and wellbeing, including health inequalities and barriers to participation.

We work to reduce the duplication of research, by promoting collaboration across institutes and enhancing the sharing of knowledge.

# ORGANISATIONAL STRUCTURE



# OUR TEAM

## STRATEGIC MANAGEMENT BOARD

### *CO-CHAIRS*

PROFESSOR KELLY MACKINTOSH
SWANSEA UNIVERSITY

OWEN HATHWAY
SPORT WALES

## RESEARCH STEERING GROUP

### *CHAIR*

PROFESSOR MELITTA MCNARRY
SWANSEA UNIVERSITY

### *INSTITUTIONAL REPRESENTATIVES*

PROFESSOR DIANE CRONE
CARDIFF METROPOLITAN UNIVERSITY

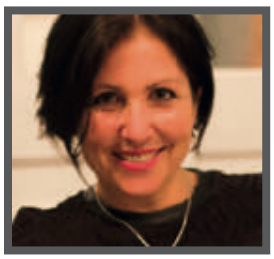
DR JAMIE MACDONALD
BANGOR UNIVERSITY

PAUL RAINER
UNIVERSITY OF SOUTH WALES

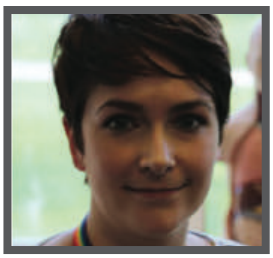
DR LIBA SHEERAN
CARDIFF UNIVERSITY

PROFESSOR GARETH STRATTON
SWANSEA UNIVERSITY

DR RHYS THATCHER
ABERYSTWYTH UNIVERSITY



DR NALDA WAINWRIGHT
UNIVERSITY OF WALES TRINITY SAINT DAVID



DR SHARON WHEELER
WREXHAM GLYNDWR UNIVERSITY

# STRATEGIC THEMES

# OPERATIONAL STRUCTURE

# OUR PROJECTS

## HOW HARD TO HIIT? PREVENTING TYPE II DIABETES WITH HIGH-INTENSITY EXERCISE

### Project Partners:

Cerin Brain, Aberystwyth University
Rhys Thatcher, Aberystwyth University
The Ceredigion GP Cluster

### Driver:

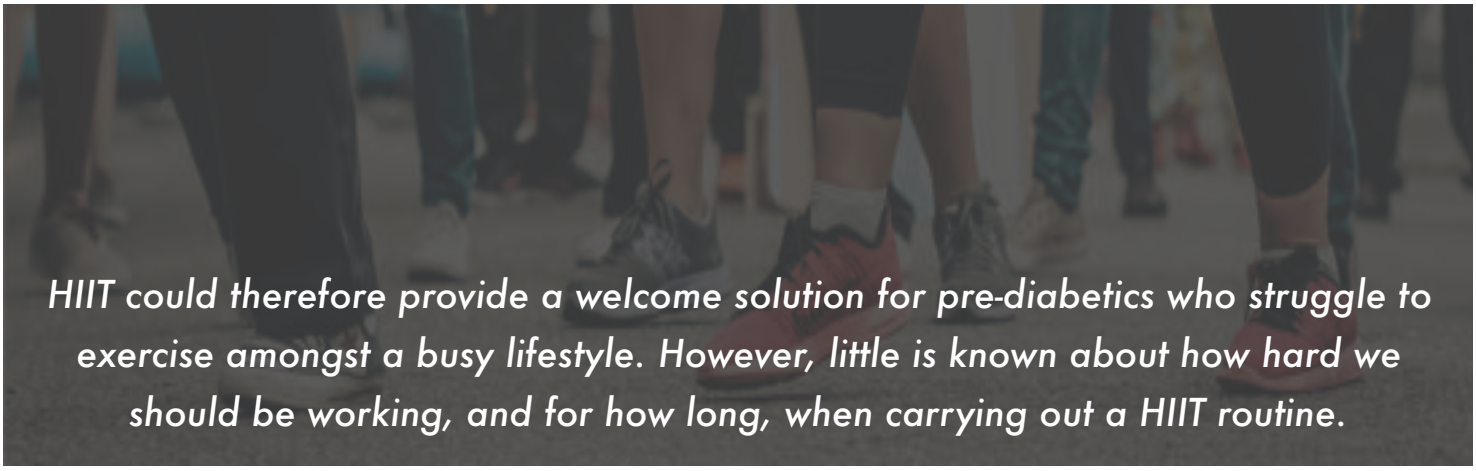
Type II diabetes causes blood sugar levels to become excessively high. This can result in serious eye, heart and nerve problems and increased risk of amputation.

However, the onset of diabetes is often preceded with a warning. 'Pre-diabetes' refers to a condition in which blood sugar levels are elevated, but not high enough to be classified as diabetic. It's possible to reverse this diagnosis by changing one's physical activity and diet. This is important, as once a person is diagnosed as diabetic they must manage their condition much more stringently in order to avoid further health complications.

Whilst many of us know that regular exercise will help control our weight and blood sugar, we also struggle to become more physically active. The most commonly reported reasons for this are a lack of time, and keeping up an exercise routine that has no supervision or structure.

However, an answer to this issue may come in the form of High-Intensity Interval Training or HIIT. HIIT has grown increasingly popular in the past several years, and involves alternating repeated bouts of vigorous exercise with periods of low intensity exercise or rest, for example in running, cycling or body-weight exercises.

Research has shown HIIT can improve blood sugar control more effectively and in a shorter time period than traditional, constant pace exercise. HIIT routines can also be carried out in a variety of locations with little or no equipment, and are easier to fit into a busy routine due to their relatively short duration.



*HIIT could therefore provide a welcome solution for pre-diabetics who struggle to exercise amongst a busy lifestyle. However, little is known about how hard we should be working, and for how long, when carrying out a HIIT routine.*

## Project:

A research study carried out at Aberystwyth University was commissioned to find out more. Cerin and Rhys worked with GP surgeries to help patients diagnosed with pre-diabetes undertake different forms of HIIT. Here, the ultimate goal is to develop guidelines on which HIIT works best for blood sugar control.

Patients attend six HIIT sessions over the course of the ongoing project, after details of health and baseline fitness are taken. These sessions are carried out at various levels of intensity, and patients' blood sugar levels are measured for 48 hours following each session using a sensor patch. Patients also choose from a menu of specific foods before, during and after their HIIT session, to control for the effects of diet.

The intensity of HIIT sessions are measured in multiple ways, including a patient's heart rate. This means that exercise programmes can be customised to a person's individual fitness level and that they can work out whether they are exercising at the optimal intensity at home by using a smartwatch.

The project also includes expertise from Aberystwyth Computer Science department, who have developed a programme to analyse data from the blood sugar readings. The partnership between the university and GP surgeries has been widely successful.

## Insight Development:

The findings of this research will be used to develop practical recommendations for use in GP surgeries and pre-diabetes information packs, to help those diagnosed with pre-diabetes successfully and effectively reverse their diagnosis. Future work will also explore the optimal duration and frequency of HIIT to help prediabetics become physically active in a way that fits their lifestyle, and contributes to happy, healthy and full future.

# OUR PROJECTS

## RE-LEARNING TO BREATHE; LIFE AFTER COVID-19

### Project Partners:

Melitta McNarry, Swansea University
James Shelley, Swansea University
Kelly Mackintosh, Swansea University
Joanne Hudson, Swansea University
Gwyneth Davies, Swansea University
Keir Lewis, Prince Philip Hospital
Zoe Saynor, The University of Portsmouth
Mark Williams, The University of South Wales
Ronan Berg, The University of Copenhagen
Jamie Duckers, University Hospital Llandough

Llywodraeth Cymru
Welsh Government

### Driver:

A high temperature, a persistent cough and a loss of taste and smell have become known as the hallmarks of COVID-19. Yet, many months after the start of the pandemic, we are also witnessing the distressing effects of long-term complications.

Although some people with COVID-19 do not experience any symptoms at all and others see improvements after about 14 days, thousands of COVID sufferers report debilitating symptoms which last far longer than a couple of weeks.

This condition, known as 'long-COVID', includes diverse symptoms; shortness of breath, extreme fatigue, gastrointestinal problems, ringing in the ears and chest pain. Other patients describe cognitive effects, or 'brain fog', as well as difficulty with light, sound and aching limbs.

Preliminary evidence suggests that as many as one in ten COVID sufferers will experience at least one of these complaints for longer than one month.

Long-COVID not only presents a wide range of symptoms, but it is also seemingly indiscriminatory. Effects can be severe in both young and old, and those with or without pre-existing health conditions. Even athletes training at the highest level have been affected, including tennis player Grigor Dimitrov, and Olympic rowers Jonny Walton and Oonagh Cousins, who were forced to severely limit their day-to-day activities as a means of managing post-viral fatigue.

There also doesn't seem to be an association between the initial severity of the virus and the experience of long-COVID. In fact, most sufferers of long-COVID did not originally need hospitalisation, yet struggle to carry out even the most basic of tasks many months down the line. Indeed, COVID-induced fatigue and brain fog can leave sufferers feeling completely exhausted after even minor bouts of exertion. Moreover, most existing research has focussed on patients who have been hospitalised, leaving those who haven't feeling neglected, lost and bereft of essential rehab and support.

## Project:

Whilst this picture seems bleak, a new research project run by Drs Melitta McNarry and Kelly Mackintosh of the School of Sport and Exercise Sciences at Swansea University, in collaboration with the Universities of Portsmouth, South Wales and Copenhagen, brings hope. This research aims to use 'inspiratory muscle training' (IMT) to tackle shortness of breath – a symptom reported by many individuals with long COVID, which also causes tiredness and difficulty with day-to-day activities. IMT is a technique used in many contexts, from elite sport to chronic disease treatment and is a form of resistance training which can help strengthen breathing muscles. In the current research, participants breathe through a small, handheld device as deeply as they can, for as long as they can. The device provides regular feedback to users via an app, so both participants and researchers can track progress over time.

In fact, the entire study is run remotely and online. Participants are contacted and trained via video calls, and independently use their own personal IMT device over the course of eight weeks. A researcher is on hand to help participants by analysing their data in real-time. Measures of participants' experience and perceived impact of COVID,

quality of life, perceived competence, motivation, physical activity levels and fitness are taken before and after the intervention, using self-report questionnaires and a physical activity monitor and a step test. These data are compared to a control group who don't access the IMT training until the end of the study.

## Insight Development:

Previous research with individuals with chronic obstructive pulmonary disease, asthma and cystic fibrosis has shown that undertaking IMT three times a week for just 20 minutes can improve how people feel and how much they move around. If this technique is successful in reducing the breathlessness associated with long-COVID, it may promote resistance to fatigue and boost mental health. People who can do more before becoming breathless are also better able to engage in activities which will further support their recovery and foster their sense of wellbeing.

Indeed, our world of 'the new normal' is not only characterised by remote working, social distancing and face coverings, but also an ever-more stretched NHS. Many long-COVID suffers are not receiving any NHS support, meaning that community-based rehabilitation strategies such as this are essential.

The research reported here can help tackle the physical symptoms of long-COVID, and restore participants' confidence and capacity

The research reported here can help tackle the physical symptoms of long-COVID, and restore participants' confidence and capacity

to continue recovering on their own.

With coronavirus case numbers rising again, the danger of both acute COVID-19 and long-term COVID is far from over. We will continue seeing the effects of long-COVID cases far into next year. Innovative research such as that reported here is essential to help those affected recover from coronavirus, and restart their life.

# OUR PROJECTS

## DEVELOPING GUIDELINES ON EXERCISE CLASSES TO BOOST MENTAL HEALTH

### Project Partners:

Paul Sellars, Cardiff Metropolitan University
Diane Crone, Cardiff Metropolitan University
European Culture and Sport Organization
European Platform for Sport Innovation
Everton in the Community
Finnish Sport Federation Tampere Region
Rijeka Sports Association for Persons with Disabilities
Technical University of Munich

SPHERE
SPORT HEALING REHABILITATION

### Driver:

Mental ill health is a significant and unrelenting problem. With approximately 30% of the population estimated to experience a mental disorder at some point in life, most of us will know someone who has been affected, or will have directly struggled ourselves.

Trying to promote good mental health is now more important than ever, in light of warnings from the UN that a mental health crisis could follow in the wake of COVID-19.

However, the picture isn't completely bleak. Whilst trends indicate mental health problems are continuing to rise, so do research efforts which try and turn the tide on mental illness. Recently, great attention has been devoted to the positive effects that physical activity and exercise can have for people with poor mental health.

Physical activity may be a particularly valuable treatment for mental disorder, given those with mental illnesses often experience additional health conditions including heart disease and diabetes, and because physical activity programmes can be a cost-effective alternative or complement to therapy or medication.

However, there is currently a lack of information and practical guidance on how practitioners (e.g. sports coaches, fitness

instructors, walk leaders) and health professionals (e.g. psychiatrists, physiotherapists, mental health nurses, occupational therapists) can develop and include sport and physical activity opportunities into the treatment for people with mental health problems.

This includes an understanding of how to design and lead programmes, taking into account the context and type of physical activities, training and education for the mental health workforce, and the often resource-limited nature of local community settings.

## Project:

In response to this, an Erasmus+ funded research project; SPHERE (Sport Healing Rehabilitation), has been developed to establish a series of user-friendly guidelines for both potential leaders of these activities and for the professionals who support the treatment of people with mental health problems. The guidelines provide practical information on how to design and lead successful physical activity sessions which benefit participants' mental health.

The SPHERE project brings together expertise from across Europe, from Italy, Finland, Croatia, England, Wales, Germany and Belgium, presented by representatives from academia, psychiatric services, local authority sports development and third sector physical activity providers. Wales are represented by Professor Diane Crone and Paul Sellars from Cardiff Metropolitan University.

Initially, the team used scientific literature, best practice examples of physical activity interventions for those with mental health problems, and a newly developed survey to produce a set of 17 guidelines on how to harness the benefits of sport and physical activity in supporting individuals' mental health.

The guidelines were tested over four different sites, before accompanying case studies were developed and practitioners provided feedback via an online survey and interviews. This information was used to form the final set of SPHERE guidelines, which encompass a number of aspects (Figure 1).

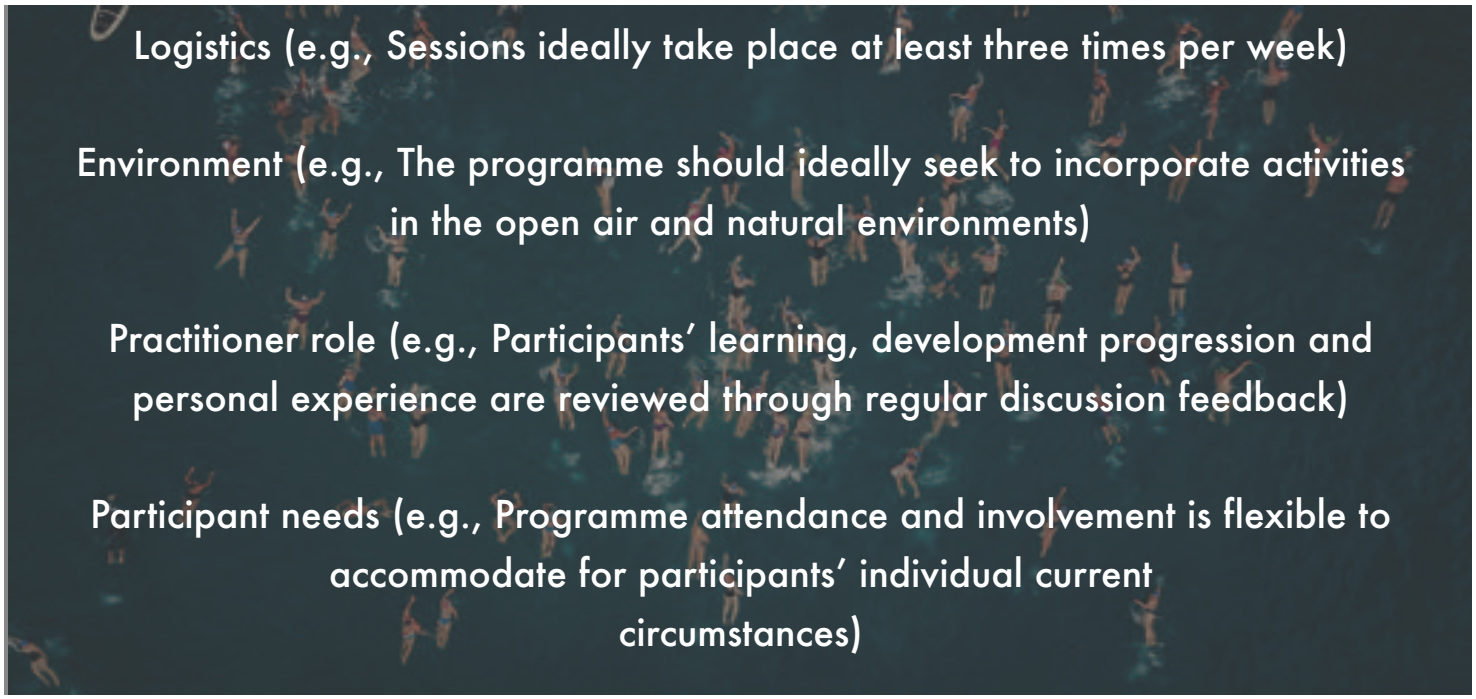



Figure 1. Aspects included by the SPHERE guidlines for running physical activity sessions to boost mental health.

Using a combination of scientific evidence and practical experience, the guidelines are particularly useful because they have been designed with people working in applied sport, physical activity and mental health settings at the heart of the process. As a result, they are adaptable to different contexts, are easy to follow and have been designed as helpful for patients with a diverse range of diagnoses.

## Insight Development:

The value of physical activity in improving mental health is clear. By providing a series of evidence-based and practical recommendations on how to design and run physical activity programmes for mental wellbeing, the SPHERE project aims to influence the physical activity opportunities available for people with mental health problems across Europe.

Providing the SPHERE practical guidelines helps make the divide between research and practice smaller, and makes evidence based practice more accessible for busy professionals working in sport and mental health. SPHERE has also developed case studies of instances where the guidelines have been used, to help to spark ideas for people wanting to develop their own programmes. Find out more here:

http://www.ecos-europe.com/sphere/intellectual-outputs/#page-content

Co-funded by the Erasmus+ Programme of the European Union

# OUR PROJECTS

## WHO IS INVESTIGATING COVID-19 & PHYSICAL ACTIVITY?

### Project Partners:

Tim Evans, Sport Wales
James Shelley, Swansea University
Kelly Mackintosh, Swansea University
Melitta McNarry, Swansea University
Owen Hathway, Sport Wales
Liezel Hurter, Swansea University

### Driver:

The emergence of the COVID-19 pandemic has impacted the work of Sport Wales and their focus in the short-, and potentially, medium-term has shifted towards responding to the COVID-19 pandemic to continue to support the local communities they serve. In response, WIPAHS conducted an audit was to determine the nature of research activity relating to the impact of the COVID-19 pandemic on physical activity, health and sport across Wales.

### Project & Insight Development:

An online survey was distributed across all eight HEIs within the WIPAHS network. At least one representative from five of the eight participating HEIs completed the survey to report their institutions were engaging in research activity relating to COVID-19.

All respondents reported:

- That members within their institution were planning to conduct further COVID-19 related research.

- A willingness to collaborate with Sport Wales, including reporting their findings to inform policies relating to physical activity, health and sport in Wales.

- Enthusiasm to develop a central registry for COVID-19 related research projects.

This provides an overview of current and planned research related to physical activity and COVID-19, and demonstrates the potential for collaboration across multiple faculties and institutions in Wales.

# OUR PROJECTS

## THE IMPACT OF COVID-19 ON PHYSICAL ACTIVITY

### Project Partners:

James Shelley, Swansea University
Kelly Mackintosh, Swansea University
Melitta McNarry, Swansea University
Liezel Hurter, Swansea University
Tim Evans, Sport Wales
Owen Hathway, Sport Wales

### Driver & Project:

Coronavirus and its associated restrictions have presented significant implications for involvement in physical activity and sport, health and wellbeing, for people across Wales.

Savanta ComRes interviewed 1,007 adults in Wales (16+ years) online from the 8th to 12th May 2020. Data were weighted by gender, age and the estimated households with children under 16 years, to be demographically representative of adults in Wales. The aim of the survey was to explore the attitudes and behaviours to physical activity (PA) during the coronavirus pandemic, specifically relating to the amount and types physical activity individuals engage in.

### Insight Development:

The majority of respondents (36%) reported engaging in more physical activity than prior to the Coronavirus pandemic. However, others reported that their physical activity was unchanged (30%) or that they were engaging in less (32%). Individuals in lower socioeconomic groups engaged in significantly less physical activity than in higher socioeconomic groups, as did individuals with long-term health conditions or illness, compared to those without. Physical activity levels were also significantly lower in individuals self-isolating due to being considered as 'at risk'.

Only 23% of children were reported to be meeting recommended PA guidelines of at least 60 minutes moderate-to-vigorous physical activity per day. However, the majority of children were reported to be engaging in between 30 and 60 minutes of PA (38%) or engaging in some PA but less than 30 minutes per day (30%). Alarmingly, 9% of children were reported to be engaging in no PA per day. There were no significant differences in these trends between higher and lower socioeconomic status families.

Participants also stated that the Coronavirus health emergency had changed their feelings about physical activity and exercise. Some individuals reported increased motivation, for and enjoyment of, physical activity during the pandemic whilst others reported reduced opportunities for physical activity and feelings of anxiety and depression, potentially mediated by reduced social contact and fear of contracting the Coronavirus.

Regardless of the direct impact of the pandemic on physical activity, it has served as an opportunity for reflection, importance of physical activity, and increased their desire to engage in it. This area may represent an opportunity for policy makers and intervention designers to have a significant, meaningful and long-term impact on population level physical activity in the months and years that follow the Coronavirus pandemic.

## Recommendations:

Individuals with pre-existing long-term health conditions or illness and lower socioeconomic groups will likely require additional support post-COVID-19

.

A better understanding of physical activity correlates during the Coronavirus pandemic may help future interventions maintain some associated benefits, such as increased motivation for physical activity, whilst also attempting to overcome some of the associated negative consequences, such as feelings of isolation and fear of social interaction.

Additional research is required to better understand the impact of the Coronavirus pandemic on children and their physical activity behaviour.

# OUR PROJECTS

## PHYSICAL ACTIVITY LEVELS, MENTAL HEALTH AND WELLBEING IN CHILDREN AND YOUNG PEOPLE IN WALES DURING COVID-19

### Project Partners:

Liezel Hurter, Swansea University
Kelly Mackintosh, Swansea University
Melitta McNarry, Swansea University
Denise Hill, Swansea University
Gareth Stratton, Swansea University
Owen Hathway, Sport Wales

### Driver:

The COVID-19 pandemic has caused unprecedented disruption to the lifestyles of children and young people. Rules around social distancing have resulted in the withdrawal of school sports and clubs, which are primary sources of structure, routine and physical activity for this population. Such changes have considerable short- and long-term consequences for the physical and mental health and wellbeing of children and young people. Indeed, there is increasing concern that the current, predominantly negative, changes in physical activity and sedentary time in response to COVID-19 may become permanently entrenched behaviours, leading to increased risks of obesity, diabetes and cardiovascular disease and lowered wellbeing. Understanding the impact of COVID-19 related restrictions on the immediate and long-term physical and mental health of children and adolescents is urgently required.

### Project:

In response to the above concerns for the health and well-being of youth in Wales, the Welsh Government have funded a study run by Dr Liezel Hurter and overseen by Drs Kelly Mackintosh, Melitta McNarry and Denise Hill and Prof Gareth Stratton of Swansea University. In collaboration with Sport Wales, the study aims to determine the immediate and long-term impacts of COVID-19 and its associated government-enforced restrictions on physical activity levels and mental health and wellbeing of children and young people.

The specific objectives are to:

i) determine the current physical activity levels and mental health and wellbeing of children and young people in Wales;

ii) track whether/how these parameters change as we progress through the phases of the pandemic;

iii) identify factors that underpin any changes, and that mediate, both positively and/or negatively, pathways between physical activity and mental health and wellbeing;

iv) provide guidance on what strategies are needed, and where, to minimise the impact of COVID-19 on children and young people in Wales' level of physical activity, mental health and wellbeing.

We are currently in the recruitment phase of the study. All schools in Wales have been contacted and asked to send the study information to all parents of children between the ages of eight and 16 years old. Child participants will complete a tailored physical activity, mental health and wellbeing survey, with a random sub-sample of 800 children being invited to take part in an additional device-based physical activity assessment. Specifically, we intend to recruit 50 girls and 50 boys from each chronological year (8-16 years) across Wales, stratified by high and low socioeconomic status according to the Welsh Index of Multiple Deprivation. The primary outcome measure will be physical activity, assessed via questionnaire and activity monitors. The secondary outcomes of mental health and wellbeing will be assessed using further questionnaires.

## Insight Development:

The entire study is being conducted remotely, utilising online surveys and posting activity monitors to participants. All measures will be repeated at a second time point three months later. The results from the study will provide insight into the physical and mental health and wellbeing of children in Wales and, in turn, inform strategic government funding priorities.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Welsh Government

# NEXT STEPS

Following the successful establishment of the presence, structure and operation of WIPAHS, objectives for our next stage are to:

SELECT & INITIATE FLAGSHIP PROJECTS BETWEEN WIPAHS & EXTERNAL STAKEHOLDERS

PRESENT THE FINDINGS OF THESE PROJECTS TO RELEVANT STAKEHOLDERS & SPORT WALES

PROMOTE AWARENESS OF WIPAHS AND SEEK FURTHER ENGAGEMENT FROM WIDER PARTNERS

THE WELSH INSTITUTE OF PHYSICAL ACTIVITY, HEALTH & SPORT
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WIPAHS@SWANSEA.AC.UK

www.facebook.com/W1PAHS
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www.linkedin.com/in/wipahs

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