Transforming gyms into community Musculoskeletal (MSK) Hubs: Mobilising the UK leisure sector to deliver inclusive, accessible, personalised and gamified health services for older adults with MSK conditions.

May 2024 Evaluation report:

Testing the feasibility and commercial viability of the MSK Hubs service model

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Introduction

The unmet need – prevalence of musculoskeletal disorders

Musculoskeletal (MSK) disorders or conditions that affect our joints, bones, and muscles, and include symptoms such as muscular pain, limited movement, and disability, continue to be a major health concern for the UK, both in terms of the impact on the economy and on individual livelihoods.

Musculoskeletal (MSK) conditions have a detrimental effect on individuals and society. In the UK, more than 20 million people have a MSK condition which account for up to 30% of GP consultations in England, and over 30 million working days are lost annually due to MSK conditions[1]. As of May 2024, 2.8 million people (7% of working age individuals) are unable to work due to long-term sickness, which has been rising since summer of 2019[2]. An estimated 3.7 million working-age people are currently in work but with a 'work-limiting' health condition that limits the type or amount of work they can do - musculoskeletal conditions remain one of most common forms of 'work-limiting' health conditions[3]. Multi-morbidity adds further complexity to the issue.

For the individuals living with an MSK condition, there are multiple repercussions of the physical condition. Not only can they cause chronic pain, but these disorders can impact the ability to engage in day-to-day activities, including work and social commitments, and have a knock-on effect on sleep, energy, and mood levels[4].

MSK conditions tend to disproportionately affect older adults, although there is an emerging trend among younger populations, with over 50% of those aged 55 plus having an MSK condition[5]. In addition, they are more likely seen in those of ethnic minorities and in low-income households and areas of deprivation, contributing to widening health inequalities across the country. Those living in the most deprived fifth of society are more likely to report a long-term MSK condition compared to those living in the least deprived fifth[5].

Multi-morbidity – living with two or more long-term conditions - adds a layer of complexity as MSK conditions rarely occur in isolation. People with osteoarthritis – a common MSK condition – are three times more likely to have heart disease, have a higher risk of diabetes[6], and are two to three times more likely to experience depression and anxiety[7] than those who do not have arthritis. People with MSK conditions are also more likely to be affected by other factors, such as obesity, physical inactivity and poor mental health, as these are major risk factors in the development of the condition[5]. The number of individuals predicted to live with multi-morbidity in England is expected to increase to over two thirds by 2035, indicating that this concern is only going to grow over the coming years and as the UK population continues to age. With this comes the growing cost that these multiple long-term conditions place on the National Health Service (NHS)[5]. NHS England data estimates the annual cost of those with one long-term condition to be £3,000[8], which almost triples for those with two or three

[1] NHS. Musculoskeletal health (obtained July 2024). https://www.england.nhs.uk/elective-care-transformation/best-practice-solutions/musculoskeletal/#:~:text=Over%2020%20million%20people%20in,quality%20of%20life%20and%20independence.
[2] Office for National Statistics, July 2024. Dataset: INAC01 SA: Economic inactivity by reason (seasonally adjusted). https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/economicinactivity/datasets/economicinactivitybyreasonseasonallyadjustedinac01sa
[3] The Health Foundation, November 2023. What we know about the UK's working-age health challenge (publication). https://www.health.org.uk/publications/long-reads/what-we-know-about-the-uk-s-working-age-health-challenge
[4] Versus Arthritis. *Musculoskeletal conditions and multimorbidities report.*
[5] Versus Arthritis (2023). *The State of Musculoskeletal Conditions 2023: Arthritis and other musculoskeletal conditions in numbers.*
[6] Dong, Qing, et al. (2017). Diabetes mellitus and arthritis is it a risk factor or comorbidity? A systematic review and meta-analysis. 18, s.l. : Medicin, Vol. 96.
[7] van den Hoek, J, et al. (2013). Long-term physical functioning and its association with somatic comorbidity and comorbid depression in patients with established rheumatoid arthritis: a longitudinal study. Arthritis Care & Research, Vol. 65.

long-term conditions. Long-term and multiple long-term conditions cost health and social care an estimated £115.2 billion a year[8].

The demand for treatment to help manage MSK conditions is growing. However, with the increase in demand for treatment there is further pressure on the current over-stretched NHS. Currently 7.8 million people (as of September 2023) are on the NHS waiting list for treatment[9], with the largest waiting list being for trauma and orthopaedics (>800,000 in March 2023) and includes non-elective surgery for MSK conditions[10]. This growing demand for NHS treatment is only heightened in areas of higher deprivation, with new figures indicating that an estimated 21% of people on the NHS waiting list are located in the poorest parts of the country[11].

Any further support to reduce waiting list time and improve access to treatment before regression in health is experienced by waiting patients with MSK conditions, is beneficial. MSK conditions comprise one of the six major conditions that have been identified by Government as requiring concentrated focus, as it contributes to 60% of the mortality and morbidity across England[12]. However, despite this, clinical settings lack the capacity, space, and resource to support this. The treatment and management of MSK conditions outside of a GP or clinical health setting, and without the need for surgery, has potential to contribute to the fulfilment of the major conditions strategy whilst reducing pressure on the NHS.

A Solution – the role of physical activity interventions

Physical activity participation and interventions, as part of a core treatment offer or as part of a rehabilitation programme, offers a tangible solution to the growing proportion of individuals living with MSK conditions and multimorbidity, of which their MSK conditions contribute. Research has long indicated that physical activity reduces the chance of establishing an MSK condition as well as managing and improving the condition. This includes reduction of pain and inflammation, improvements in muscle strength which aid joint stability and reduce risk of future injury, and improvements in structure of cartilage, mobility, function, and mental health[13].

Physical activity participation offers a multi-faceted solution to rehabilitation for MSK conditions and multimorbidity as it provides a foundation for improving physical health alongside opportunities to connect socially and support wellbeing and mental health. This is an important facet, as it has been identified by Office for Health, Improvement and Disparities (OHID) that a holistic approach needs to be taken in treatment for comorbidities[14], which account for the physical, social, and mental needs of the individual. This makes physical activity-based interventions that also focus on supporting the more

[8] NHS England. The NHS belongs to the people: a call to action. July 2013. Available at: https://www.england.nhs. uk/wp-content/uploads/2013/07/nhs-belongs.pdf [Last accessed November 2023]
[9] Baker, C. (2023). NHS Key Statistics: England. https://researchbriefings.files.parliament.uk/documents/CBP-7281/CBP-7281.pdf
[10] The Kings Fund. (2023). Waiting times for elective (non-urgent) treatment: referral to treatment (RTT). https://www.kingsfund.org.uk/projects/nhs-in-a-nutshell/waiting-times-non-urgent-treatment#:~:text=The%20largest%20single%20waiting%20list,than%20800%2C000%20in%20March%202023.
[11] Liberal Democrats. (2023). One in five people on NHS backlog list in some areas. https://www.libdems.org.uk/press/release/one-in-five-people-on-nhs-backlog-list-in-some-areas#:~:text=The%20House%20of%20Commons%20Library,NHS%20waiting%20lists%20than%20others.
[12] DHSC. (2023). Major conditions strategy: case for change and our strategic framework. https://www.gov.uk/government/publications/major-conditions-strategy-case-for-change-and-our-strategic-framework/major-conditions-strategy-case-for-change-and-our-strategic-framework--2#chapter-4-living-with-major-conditions
[13] Versus Arthritis. Providing physical activity interventions for people with musculoskeletal conditions. https://versusarthritis.org/media/2177/physical-activity-msk-health-report.pdf
[14] OHID. (2022). Musculoskeletal health: applying All Our Health. https://www.gov.uk/government/publications/musculoskeletal-health-applying-all-our-health/musculoskeletal-health-applying-all-our-health

holistic aspects of health an applicable solution for the rehabilitation of MSK conditions outside of a clinical setting.

The fitness and leisure sector is well suited to provide these solutions in non-medical settings. There is considerable size, diversity and social value across the fitness and leisure sector, which spans public and private leisure operators, gyms, suppliers, independent and boutique services, consultancy and support services and self-employed fitness professionals. Public and private leisure centres are located close to local communities and can offer a variety of activities, a variety of spaces and facilities, and a variety of trained staff that can support the delivery of physical activity.

Currently, there are a variety of programmes and services that adopt this approach of non-medicalising treatment for MSK and long-term health conditions (LTHCs), and each has shown success in its own ways. For example, ESCAPE-pain programme (see below for description) is a NICE approved, award-winning programme that has been delivered in leisure centres since 2016. It has been implemented across the UK, and has shown to improve pain and physical function, reduce health care utilisation and provide social care savings[15,16]. Similarly, Good Boost has been running successfully in 2018 in pools and leisure centres, with results demonstrating reduced pain scores and improved self-reported quality of life in users[17]. Other evidence-based programmes, such as Fit and Strong!, Arthritis Foundation Exercise Program (AFEP), Chronic Pain Self-management programme, and ALED – Active Living Every Day are also currently running in community settings, offering support specifically for arthritis pain management and physical activity participation. There are also others, such as Move it or Lose it, REACT (Retirement in ACTion), Sport for Confidence, Innerva and co-location models such as Guys and St Thomas's physiotherapy pilot in local gyms, which are still building their evidence bases but have been designed to utilise community spaces (e.g. leisure centres and community centres) to deliver exercise-based rehabilitation. Most capture the impact on the end user – like improvements in physical activity levels, health-related quality of life, and increased independence and social connections – rather than the overall impact on the feasibility and longevity of offering these services.

Other programmes, such as the PERFORM trial, are beginning to test personalised exercise rehabilitation for people with multiple LTHC (multimorbidity) into the community leisure centres. The key features of all these programmes are that they aim to include educational and upskilling components for health care and exercise professionals that is evidence-based, are low cost to the end user, and offer socialising and self-management opportunities. Collectively these types of programmes have been implemented to increase accessibility for end users, reduce fears linked to rehabilitation by offering it in an inclusive, local setting, and take pressure off the NHS alongside still treating individuals for 'medical' conditions.

Such programmes demonstrate that there is demand for rehabilitation services for MSK conditions that can be effectively self-managed without medical intervention or outside of a medical setting. Some of the re-occurring positives of the programmes provided across the fitness and leisure sector are that they have components that address both the physical, mental, and social health of individuals – as per the OHID guidance. The programmes address not just the MSK condition, but a variety of multimorbidity that comes with it. Additionally, they are more accessible at a community level – hosted in local centres and in a less daunting, less busy, non-clinical settings. They offer the

[15] Hurley MV, Walsh NE, Mitchell HL, et al. Clinical effectiveness of a rehabilitation program integrating exercise, self-management, and active coping strategies for chronic knee pain: a cluster randomized trial. Arthritis Rheum 2007; 57: 1211–9
[16] Hurley MV, Walsh NE, Mitchell H, et al. Long-term outcomes and costs of an integrated rehabilitation program for chronic knee pain: A pragmatic, cluster randomized, controlled trial. Arthitis Care Res 2012; 64: 238–247.
[17] Good Boost (2020). Good Boost Data Report: March 2020. https://3fddc837-c361-4daa-b45a-10cf82ea9527.filesusr.com/ugd/47dc1f_d5efb75767db4aafb790b8c29f2552a4.pdf

opportunity for ongoing accessible support for individuals close to home, in an environment they are comfortable re-attending.

Transforming gyms into community MSK Hubs

Despite the existence of multiple services for MSK conditions and LTHCs management, rehabilitation and support, an integrated solution that makes the best use of the fitness and leisure sector's spaces (facilities based in communities) and people (workforce) comparatively does not exist. This sector offers a currently underutilised infrastructure that can be used for the delivery of MSK conditions and holistic wellbeing services, using existing community assets (places and people) in a way that is more accessible (both in terms of location and waiting time) and affordable to the community. The latter two offer an opportunity to support the reduction in health inequalities through utilising a community-based approach to rehabilitation, instead of a clinical approach.

As part of an awarded bid for the Healthy Ageing Challenge – Designed for Ageing, from UK Research and Innovation – a consortium of partners developed the programme "Transforming gyms into community MSK Hubs: Mobilising the UK leisure sector to deliver inclusive, accessible, personalised and gamified health services for older adults with MSK conditions", or MSK Hubs for short, working together to create a product that provided a solution to the above and transforms gyms into community hubs.

This industrial research project, running from April 2022 - March 2024, was a feasibility pilot study, which aimed to complete the product co-production, development, testing and research evaluation of the 'MSK Hubs' product. The objectives were subsequently to understand and determine if it was feasible to achieve public roll-out and commercialisation of MSK Hubs post-project and if it offered a sustainable long-term model that supported localised MSK rehabilitation in a leisure centre setting. The project delivery was a partnership between Good Boost, ukactive, ORUK ESCAPE-pain, and Arthritis Action. Each consortium partner brought an element to the MSK Hubs product which collectively provided a symbiotic offer that supported both the varying and individual needs of those older adults with MSK conditions and suited the operational and implementation needs of the leisure centre operators. The role of each partner is outlined in more detail in Table 1.

Good Boost started as a community health research project in public swimming pools in Oxford, England. Since then, they have pioneered the co-design and development of technology for personalised therapeutic exercise and rehab, on land and in water. Good Boost launched as a social enterprise in 2018 with the ambition to create more accessible and affordable options for people living with joint conditions and wider LTHC to have more options that combines the practical, emotional and support for effective supported self-management. Specifically, Good Boost offer an artificial-intelligence recommendation system, built-upon published clinical research for musculoskeletal exercise and rehabilitation on land and in water.

ukactive is the UK's leading not-for-profit membership body for the physical activity sector, bringing together more than 4,000 member organisations and partners in a shared ambition to get More People, More Active, More Often. From gyms, leisure centres, studios, sports bodies, and other activity providers, to major health bodies, consumer brands and equipment manufacturers, ukactive's community collaborates across the private, public and third sectors. ukactive facilitates high-impact partnerships, conceives, and drives breakthrough campaigns, conducts critical research, and lobbies the Government to recognise the power of the physical activity sector to address today's biggest issues – including 'levelling up' health, reducing the burden on the NHS and social care, reducing crime, revitalising our high streets and communities, tackling loneliness and driving our physical and mental recovery from COVID-19. For MSK Hubs, ukactive provided sector knowledge and expertise, standards, and research.

ESCAPE-pain programme is an evidence-based, integrated, group rehabilitation programme that has been shown to reduce pain, improve physical function, activity levels and the psychological consequences of pain, while reducing healthcare costs[18,19]. The programme helps people with chronic joint pain understand, manage, and cope with their condition, offered to support either knee and hip pain, or chronic back pain[20]. ESCAPE-pain programme training has been adapted so that exercise professionals can deliver it in leisure and community centre, to support the de-medicalisation and sustained self-management of joint pain[21]. The Orthopaedic Research UK(ORUK) ESCAPE-pain programme comprises a key component of the MSK Hubs product and offer.

Arthritis Action have over 80 years of working to help individuals with arthritis better self-manage their condition. This includes expertise and understanding of the daily challenges that the MSK community faces. Arthritis Action provided expertise from the facilitation of thousands of arthritis community groups, providing arthritis specific exercise/lifestyle resources, and creating peer to peer community for those with MSK conditions[22] to MSK Hubs.

Table 1. Partner roles and descriptions of the MSK Hubs services

Partner	Role	Content details
ukactive	Conduit for the sector / leisure operators	As the fitness and leisure sector member organisation, ukactive provided the link and engagement with operators across the sector to support the delivery across all sites. The Public Affairs and Policy work looks to support members through the Governmental policy influencing and engagement, which was undertaken throughout this project.
	Leader of 'The Active Standard' for MSK Hubs	The Active Standard aims to create and embed a sector standard to support the continued professionalism of the sector and help drive the credibility of leisure centres for Healthcare Professionals. The Active Standard was trialled in a sub-sample of operators rolling out the MSK Hubs to provide them with an accreditation indicating they achieved a set standard needed to deliver the MSK Hubs product. These operators had to submit evidence around healthy and safety, staff qualifications & training, safeguarding, ED&I, and customer feedback (among others). Passing The Active Standard then denoted said operators had a suitable and safe environment in which to deliver the MSK Hubs.

[18] Hurley MV, Walsh NE, Mitchell HL, et al. Clinical effectiveness of a rehabilitation program integrating exercise, self-management, and active coping strategies for chronic knee pain: a cluster randomized trial. Arthritis Rheum 2007; 57: 1211–9

[19] Hurley MV, Walsh NE, Mitchell H, et al. Long-term outcomes and costs of an integrated rehabilitation program for chronic knee pain: A pragmatic, cluster randomized, controlled trial. Arthritis Care Res 2012; 64: 238–247.

[20] Hurley M, Walsh N, Bhavnani V, et al. Health beliefs before and after participation on an exercised-based rehabilitation programme for chronic knee pain: Doing is believing. BMC Musculoskelet Disord 2010; 11: 31.

[21] Hurley M, Thompson F. Community-based care for people with chronic knee and hip pain: Preliminary clinical outcomes and healthcare utilisation for ESCAPE-pain. Musculoskeletal Care; 2023. DOI: https://doi.org/10.1002/msc.1847.

[22] https://www.arthritisaction.org.uk/wp-content/uploads/2023/11/Impact-Report-2022-23-Web-reduced-size-file.pdf

	Evaluation lead for MSK Hubs	The ukactive Research Institute are experts in providing research and evaluation services to understand the implementation of efficient approaches to maximise real world effectiveness. This includes producing high-quality, ground-breaking and rigorous research that contributes to supporting people across the UK to be physically active and both showcase sector best practice and highlight areas for growth.
Good Boost	Project lead and developer of digital technology for the MSK tablet	Good Boost designed and manufactured a waterproof tablet-computers which included A.I. medical technology which created individually tailored therapeutic exercise programmes and supported self-management services. Arthritis Action content was integrated into this. The exercise programmes were developed from extensive co-design over 6 years and incorporated clinical evidence and guidelines on exercise for people with MSK and wider health conditions. Good Boost also had a leading role in the engagement and outreach to the leisure operators and supported in the management of project operations.
Arthritis Action	Provider of arthritis-specific educational content for the tablet environments. Arthritis and activity Knowledge sharing programme for leisure centre staff, and educational recourses to enable the facilitation of arthritis community groups within a leisure setting.	Arthritis-specific content focused on pain and self-management, mental health, nutrition, sleeping and relaxation and staying active, among others. Tailored towards participant education. Two training programmes were developed for leisure centre staff. • Supporting staff in better understanding arthritis, common barriers to exercise participation and motivational discussions. • Developing the skills to facilitate an arthritis community group in a leisure setting
Orthopeadic Research UK (ORUK), ESCAPE-pain programme	ORUK are a UK charity that brings together musculoskeletal professionals to reach our common goal – a healthy ageing society, they support the implementations of ESCAPE-pain programme.	Delivery of the NICE approved ESCAPE-pain programme for leisure and community centres. This is delivered in person by a trained facilitator for 6 weeks (x 2 sessions per week). Each session includes an educational discussion around a set theme (e.g. pain management techniques), followed by circuit type exercises. Individuals complete pain metrics (Knee Injury and Osteoarthritis Outcome Score; KOOS or Hip

	ESCAPE-pain provide their integrated, group rehabilitation programme	Disability and Osteoarthritis Score; HOOS) at baseline and 6-weeks which are used to determine changes in pain, function, and quality of life.

Specifically, this project will address three critical elements that are needed as part of an integrated MSK service that operates in a community setting and promotes opportunities for sustainable support. These are:

- *Place*: creating visibility and credibility between leisure facilities and health for older adult MSK referral pathways. Specifically, increasing the accessibility, quality, consistency, and evidence for leisure venues to increase visibility and signposting of older adults via Health care Professionals (HCPs) and Social Prescribers (SPs).
- *Product*: creating a personalised MSK conditions rehabilitation and holistic wellbeing service that can be adapted to every older adult user, utilising validated AI-technology with W3C accessibility standards and available both in-venue and virtually.
- *People:* utilising an existing workforce in leisure, by upskilling leisure staff and volunteers to offer this holistic wellbeing service in community venues, combined with the expertise of arthritis charities evidence-based self-management services, both in-venue and virtually. This to include the upskilling of leisure staff to create relationship-focused holistic services that provide both emotional support and self-management of MSK conditions, utilising training from existing national MSK charity groups.

The above concept was developed based on the need to fill an unmet gap in the market for MSK conditions rehabilitation in community settings, as well as extensive co-design with older adults. This co-design involved over 40 focus groups and surveys with older adults, leisure operators, HCPs, and SPs to understand the current problems and barriers to community-based rehabilitation delivery. Questions centred on exploring opinions of leisure facilities as a location for delivering health and wellbeing services, and what would be needed in these facilities to deliver such services safely and effectively. Analysis demonstrated that the majority of participants did feel leisure facilities were suitable to support the treatment and management of MSK conditions, along as there were qualified staff, evidence-based exercises, and community and social support available. These findings then helped inform the basis of the MSK Hubs product.

This project adopts an approach that aligns with pre-existing commissioning models for the delivery of physical activity interventions for MSK conditions. A joint report from the Department for Health, Public Health England, NHS England and Arthritis Research UK released in 2016 outlined a four-tier approach to this delivery which stipulated the need for interventions to be delivered in accessible community facilities (e.g. leisure facilities, swimming pools; Tier 1), in a space where it can be supervised (e.g. by qualified staff, Tier 2), is structured and community based (Tier 3) and is individualised (Tier 4). It also vital that any model is targeted to meet the needs of the end user (Tier 4, individualised), as generic rehabilitation programmes may not provide the level of intensity or specificity that each individual needs[13].

The MSK Hubs programme was built upon existing solutions and products to develop a package solution which could be easily implemented by any leisure provider (public or private) within their facilities. It was also developed by pooling together and adapting the existing services of all consortium partners. MSK Hubs continued to be iterative, adapted and improved throughout the duration of the project, through ongoing co-design with users, leisure and health stakeholders and the project team.

This ongoing process of refinement also demonstrates the potential that this programme model must interlink in with existing models of MSK rehabilitation. Details of the programme are outlined below.

A video explaining MSK Hubs was created for leisure facility engagement in the project and explains the delivery in its entirety. This can be seen by clicking here.

Methodology

The MSK Hubs programme implementation

As described, MSK Hubs is a multi-component project delivered within leisure centres. The below describes the set-up process that was undertaken. Decisions on sites were fluid and had multiple dependencies, but in the first instance, given this was a UK governmental initiative, the project had a UK-wide remit and had to be delivered in all four home nations. It was then down to regional relationships with the project partner, the primary care links, and the local level demographics such as deprivation due to the aim of influencing health equity.

Project set up

1. Site selection was initially mapped against the Indices of Multiple Deprivation (IMD) to ensure delivery was targeting areas that might experience greater health inequalities. This was done using available postcodes to select sites that were located in, or close to, areas of deprivation across the UK. For operational reasons, the onboarding of multi-site operators meant that site engagement expanded beyond these initial mapped areas and delivery also took place in sites located in more affluent areas.
2. Based on the initial mapping exercise, the MSK Hubs project partners held multiple webinars for operators of interest to engage individuals at national and senior level and introduce them to the aims of the MSK Hubs pilot project. These webinars included examples of what MSK Hubs involved using a digital animated video and how MSK Hubs could embed into the existing services in their facilities. They also included an overview of The Active Standard accreditation for MSK Hubs and a demonstration of the MSK Hubs tablets used. Sites then gave an expression of interest which led to more specific question and answer webinars with the project partners.
3. Once operators were agreed and had site approval, webinars, training and demonstrations were provided as part of the onboarding process. This was both documented and shared with all project partners to engage and upskill participating operators in their individual elements of MSK Hubs.
4. A 'Venue Pack' was circulated to the operator, summarising the project, containing a who's who, marketing materials, risk assessments, Frequently Asked Questions, and NHS England questions, which could then be disseminated out to their sites ready for roll out of MSK Hubs. The project partners then each activated their independent offerings. Activation of the different parts of the MSK Hubs continued to occur on a rolling basis throughout the project, dependent on the onboarding and readiness level of the operator(s).
5. Regular touch points took place between the operator and each of the project partners involved in the MSK Hub.

The Active Standard set up

1. ukactive worked with Right Directions (ukactive's The Active Standard partner) to select a sub-sample of operators to pilot The Active Standard for MSK Hubs. Once a Service Level Agreement had been agreed, ukactive informed Right Directions and shared relevant site information.

2. If an operator had multiple sites as part of MSK Hubs, Right Directions randomly selected 15% to complete The Active Standard accreditation.
3. ukactive arranged for a The Active Standard specific overview webinar with ukactive, Right Directions, and the operator staff both at national, senior, and local level for efficiency and uptake.
4. Right Directions circulated a 'welcome' email and The Active Standard processes commenced.
5. There were regular touch points from Right Directions and ukactive with the operators during The Active Standard processes.

Arthritis Action set up

1. Two training programmes were developed to a) enable leisure centre staff to support and engage with individuals with arthritis and pain more effectively, and b) upskill staff to successfully run and facilitate an arthritis community group within a leisure centre setting (see Table 1 for details). Arthritis-specific educational content was developed for the tablet environments.
2. Arthritis Action engaged with onboarded operators at a site level to offer and deliver the training. Training was designed to be completed around the existing work schedules of staff and availability (taking roughly 15 minutes).
3. On average, competition of training took 2 weeks from when it was received. Certain sites - those who were more engaged from the offset - saw quicker competition times, with less engaged sites taking longer – up to one month. The variety in completion had a knock-on effect on the start dates and impacted the amount of community group sessions that were delivered throughout the MSK Hubs project, and explains the site level variation.
4. Once trained, staff were encouraged to deliver community groups as a first point of call or entry for individuals into the leisure environment, and then continue alongside the delivery of the other MSK Hubs elements.
5. Facilitators were also encouraged to collect informal data from participants on their experiences of the community groups and the MSK Hubs product. This was initiated towards the end of the delivery, and most data was collected on this throughout October – December 2023. Data collection was set up via the tablet environment in summer 2023, and the arthritis-specific educational content.

ESCAPE-pain set up

1. ESCAPE-pain made contact with onboarded operators at a site level to offer them the training for the delivery of the ESCAPE-pain programme. Delivery start times varied across sites as some sites already had staff trained to deliver ESCAPE-pain due to existing national programme coverage. Some providers were able to quickly identify appropriately qualified (e.g. Level 3 Exercise on Referral) to deliver this programme, and could enrol into ESCAPE-pain training immediately, but others needed to upskill staff to meet the pre-requisites first.
2. On agreement to complete training for those untrained, on average it took 12 weeks for a site to have their staff trained. However, some locations took up to a year to complete training, facing limitations due to staff availability and capacity.
3. ESCAPE-pain delivery and data collection varied across the second phase of the project, with much delivery commencing in Autumn 2023. ESCAPE-pain data collection was set up via the tablet environment in summer 2023, as was any educational self-management content that formed part of the ESCAPE-pain programme.

Good Boost set up

1. The Good Boost data team set up the tablet computers that host the Good Boost personalised activities and capture data through self-report.
2. Individual operator sites were sent a set number of tablets to use in their locations to deliver Good Boost aqua and land programmes. Staff were supported, through webinars, on how to navigate and use these tablets with participants.
3. Upon starting the MSK Hubs programme participates registered using the tablets and completed a number of self-report metrics. Based on the answers participants then had access to the Good Boost personalised programme, and later Arthritis Action and ESCAPE-pain educational content.
4. Tablets were used in leisure centre settings only, with individuals logging in upon return to the centres to continue their MSK Hubs programme participation.
5. Data captured through the tablets was also available in the form of dashboard directly to the operators and to the MSK Hubs project data team, to inform the project evaluation, and support the refinement of the MSK Hubs product.

Delivery

Delivery was led by the need at a local level, with each operator and site delivering the parts of MSK Hubs they felt best met the need of their members and local community. Where multiple project partners were delivering at any one site, participants were able to engage in any part of MSK Hubs at any time. This provided structure for participants but individual choice to attend what was best for their condition. Figure 1 provides an overview of the planned MSK Hubs set-up and delivery. However, due to as onboarding and delivery start times varied from operator to operator this impacted the start date and implementation of data capture through the tablets, meaning that some data capture was limited for certain parts of the product (e.g. for ESCAPE-pain) even though these products continued to be delivered.

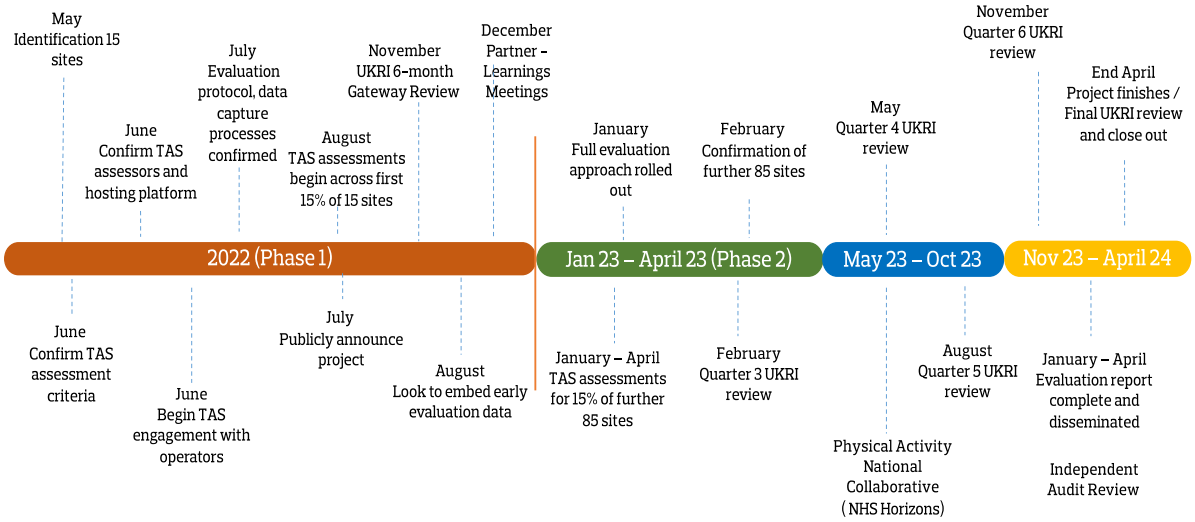

Figure 1. MSK Hubs delivery timeline.

Evaluation and Data Collection

Evaluation was put in place to understand the feasibility of implementing and delivering the MSK Hubs product in leisure facilities. Specifically, this involved looking at how MSK Hubs is used by participants, how MSK Hubs is delivered locally at the leisure facilities, and understanding the wider activity participated in at the leisure facilities by MSK Hubs participants.

To do this, the evaluation needed to understand who was taking part and using the MSK Hubs, how they came to be involved, how they interacted with delivery partners (e.g. what are they using), if there were any changes to health outcomes as a result of taking part in MSK Hubs activities, and if they went on to interact with the facility outside of the project. The number of variables were collected and grouped together to measure the following:

- Leisure centre utilisation - how MSK Hubs was used and initiated in leisure centres.
- Adoption and adherence - total throughput, activity attendance and adherence.
- Participation - types of activities engaged in through MSK Hub and the centres.
- Referral pathway effectiveness - how users heard about the MSK Hubs.
- Health outcomes - impact on pain scales, physical activity levels and personal wellbeing measures, along with participant feedback on experience and mental health.
- Feasibility of delivery and business case - the feasibility of implementing MSK Hubs as a profitable model for leisure centres, captured through understanding participation, adoption and adherence.

The specific variables collected are shown in the evaluation project flow in Figure 2. below.

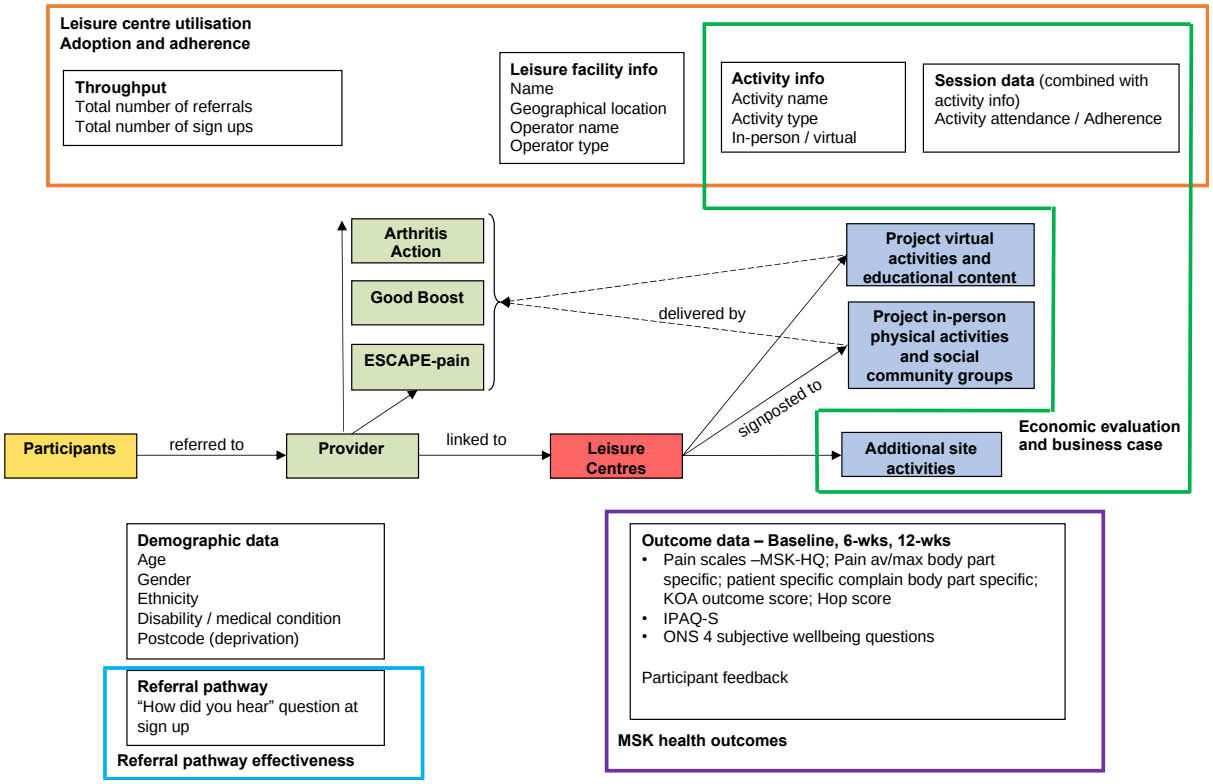

Figure 2. MSK Hubs evaluation project flow diagram.

Data collection process

The data collection system development and implementation for the MSK Hubs project required several stages. Phase I consisted of the agreement of the primary outcomes for the whole project and outcomes that are service (Good Boost, ESCAPE-pain programme, Arthritis Action) agnostic. This was completed by the end of the first quarter of the project and before phase I of the pilot roll out. The agreed structure required a complete reconfiguring of the Good Boost app, API, database system and the development of the ability to integrate other services within it (i.e., ESCAPE-pain programme and Arthritis Action). During the pilot phase the system to collect the ONS-4 and IPAQ as well as consent for inclusion in the project was completed.

The original follow-up times in the Good Boost system for outcomes was four-week intervals and completion were optional. However, it was felt with this project follow-up times would be 6, 12, 26, 52, 78 and 104 weeks with compulsory responses i.e., less frequent but allowed for a higher response rate (response rate to optional outcome had a response rate of approximately 33%). Additionally, the design for the environments for the other partners services and their data collection systems where completed.

The designing of the ESCAPE-pain programme environment and its data collection was initiated at the very beginning of Phase II role out, with the initial version was ready in spring 2023 and was completed in the June 2023 release of the Good Boost Hub. This development required a new environment, statistics page in the app, API changes and database adjustments. The Arthritis Action environment was built immediately following this and released at the end of August 2023. Regular releases are kept to every two-months based on feedback from the leisure centre, with more frequent updates impacting their delivery.

After competition of the data collection tools, the data dashboards within the centre portals required a full update with the addition of data dashboards for the two new services and approximately 20 new data points for the general delivery of the whole service. Based on feedback, a super admin portal was developed allowing operators to view their whole dashboard with a download option for images as well as raw data for each data point within the system. This was completed and released in December 2023. It was clear during the phase I roll out that a full analytical database was required to allow easier access to the data. Work on this started in May 2023 and was completed in December 2023, allowing responsive reviewing of both service and application performance. This was completed through the recruitment of two external data scientists, an internal data scientist and a data engineer.

In summary, the development of the data collection and evaluation tools was underestimated at the initiation of the project with new requirements coming from venues, for internal and external review and app development. The initial development phase for the app and tablet, originally planned to take 6 months, was ongoing over 12 months, which may have impacted participation in elements of the MSK hubs programme across different sites and impacted the amount of data that could be collected from all parts of the MSK Hubs product.

However, as a result, in addition to data collected through the tablet, qualitative data was collected on an ad hoc basis in phase II, in order to understand in more detail the experiences of participants and obtain feedback to assist with the ongoing development of the MSK hubs product. This data was collected by facilitators of the Action Arthritis's community groups and was designed to be informal and semi-structured to maintain the relaxed, safe environment that was the purpose of these groups. Facilitators were also interviewed about their experiences. Questions were developed with input from the ULK active research team and the ukactive Research Institute and centred on asking participants

about why they had joined the MSK Hubs programme, their pain experiences and any chances in daily activities as a result of taking part in the hubs, if they had taken part in further activities and what they felt could be done to improve the MSK Hubs product. Facilitators were asked to provide details on how they felt delivery of the community groups went and if they required further support.

Results

Data collected via the tablet computer or virtual app only between September 2022 and December 2023 is presented below.

Facilities

Across the project delivery, 94 leisure facilities, out of the planned 100, from 20 leisure operators were engaged to deliver MSK Hubs. The remaining six were engaged but due to local operational implications decided not to deliver MSK Hubs. Delivery was provided by 15 operators across 72 facilities during the data collection window. A continuous site engagement process was adopted by the project meaning that sites could start delivering at any point from September 2022, with some sites starting delivery in 2024, after data cut-off for this report. Across the delivery, total session participation was 11,785 from 1,631 unique participants. A full breakdown of participation overall and by project delivery partner (Good Boost, ESCAPE-pain programme, and Arthritis Action) can be seen in Table 2. This shows that many participants only attended a single facility, with some participants attending more than one facility, which in some instances were provided by different operators.

Table 2. Breakdown of engaged and delivering operators, facilities, and participants for the project as a whole and by delivery partner.

	MSK Hubs	Good Boost	ESCAPE-pain*	Arthritis Action*
Number of operators (overall)	15	15	6	8
Number of facilities (overall)	72	72	19	29
Number of operators (reporting data#)	15	15	4	5
Number of facilities (reporting data#)	72	72	6	6
Total session participation	11,785	11,718	43	24
Unique participants at site level	1,710	1,681	34	20
Unique participants at operator level	1,644	1,615	34	20
Total unique participants	1,631	1,602	34	20

*Due to the data the session structure and data collection approach, attendance at each session was not recorded before the app environments were live. These participation numbers reflect the users first attendance recorded within the app and therefore are an underestimation. #Reporting data applies to those delivering MSK Hubs and data being reported via the tablet. Some facilities started delivery after the data cut off point, and some facilities did not provide data due to the app environment development.

Figure 3 shows how participation increased month on month as delivery progressed, and facilities were engaged to deliver MSK Hubs. Figure 4 indicates the rate at which sites started delivery with the largest period of delivery starting in the middle months of the project, with new sites continuing to start delivery up to the data cut off point. The peak being 2,074 session participations in November

2023. The drop off seen in December is likely due to facilities pausing delivery for the Christmas period, rather than a reduction in participation.

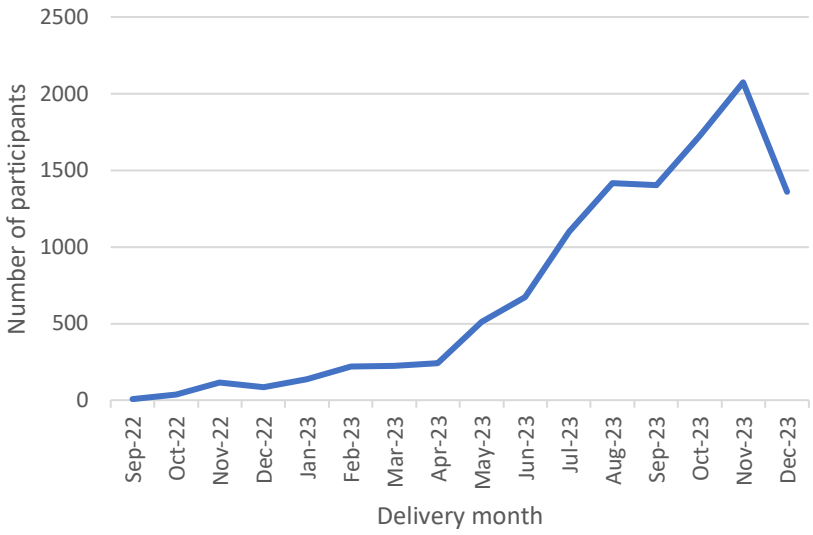

Figure 3. Monthly MSK Hubs participation.

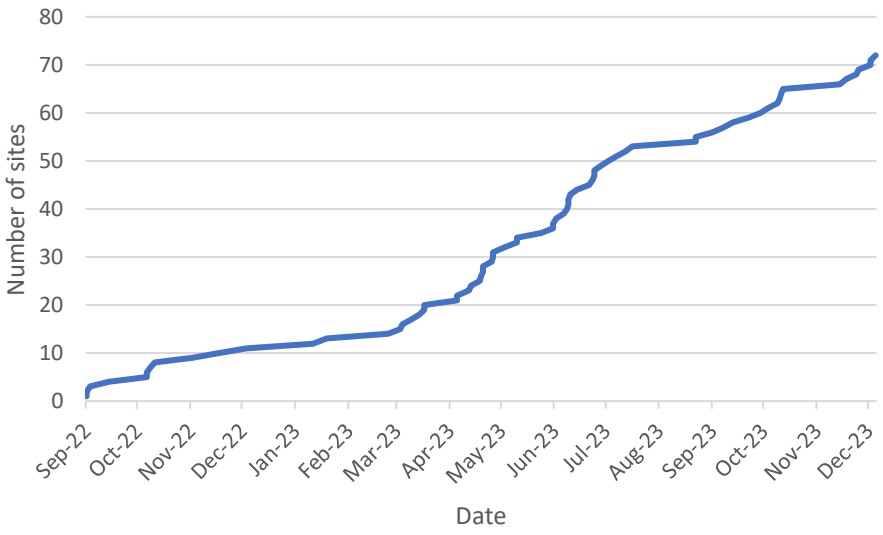

Figure 4. Delivery commencement date over time.

How each of the operators and sites delivered MSK Hubs was a local decision. For example, for some sites decided certain elements of the MSK Hubs product were more feasible to implement than others given time, capacity, resource, localised processes and local need. The number of facilities delivering each component of MSK Hubs as seen in Table 2 highlights this local choice, with this table only acting as an initial indication of delivery choices and likely an underestimation (see table notes for detail).

Additionally, 13 facilities delivered Good Boost and ESCAPE-pain programme, 18 delivered Good Boost and Arthritis Action, and five delivered all three providers.

The Active Standard (TAS) was piloted in a total of 26 sites, across phase 1 (n=5) and 2 (n=21) of the project. The onboarding of these sites was individualised to the operator's needs, considering their capacity and localised processes in the timeframe for training and completion. The sites were located across the UK, including Scotland and Lancashire, London boroughs, Surrey, Hertfordshire, and Cornwell. By the end of phase 2, a total of 13 sites had passed TAS, and 10 were actively working towards completing the accreditation. Over half (8/13) of these sites were onboarded for TAS in February 2023 and completed it in April 2023. The other five, plus the additional 10, were onboarded in summer (July/August 2023), completing the accreditation between September 2023 – March 2024.

Participants

In total, 1,631 participants registered to take part in MSK Hubs.

Table 3 provides an overview of the registered participants' demographics. A high proportion of females (81.2%), White (91.5%) and older adults, with 61.2% aged 60 and above have registered to take part. Age was reflected in the employment status with half of participants retired (50.9%). This data can be compared to national population data, provided through the 2021 UK census (for England and Wales) to understand which demographics need further engaging in the future. This indicates that a greater proportion of adults over the age of 60 were engaged in the MSK Hubs programme compared to national population data, but that a greater proportion of Males and individuals from non-White backgrounds (particularly those from Asian and Black ethnic groups) could be engaged.

Table 3. Demographic breakdown of registered participants.

Gender	n	%	% census (2021)
Male	272	16.7%	48.9%
Female	1325	81.2%	51.0%
Other	26	1.6%	N/A
Prefer not to say	8	0.5%	N/A
Age	n	%	% census (2021)
Under 20*	4	0.3%	2.9%
20-29	63	4.1%	15.9%
30-39	114	7.5%	17.2%
40-49	126	8.2%	15.9%
50-59	286	18.7%	17.3%
60-69	501	32.7%	13.6%
70-79	374	24.4%	10.9%
80-89	47	3.1%	5.2%
Over 90	15	1.0%	1.1%

Ethnicity	n	%	% census (2021)
Asian	60	3.8%	9.6%
Black	43	2.7%	4.0%
Mixed ethnicity	21	1.3%	2.9%
Other ethnic group	10	0.6%	2.1%
Prefer not to say	36	2.2%	N/A
White	1447	91.5%	81.7%
Employment status**	n	%	
Employed full time	275	17.6%	
Employed part time	228	14.6%	
Prefer not to say	74	4.7%	
Retired	797	50.9%	
Student	14	0.9%	
Unable to work	177	11.3%	

*youngest age 18 (reflected in census %)

**comparison to census data not available

Medical condition data was captured at baseline from 1,213 participants. As expected, the majority of participants reported having an MSK condition (68.8%). Participants also presented with cardiovascular conditions (28.4%), respiratory conditions (20.0%), diabetes (Type I – 1.2%, Type II – 12.5%), neurological conditions (11.8%), renal conditions (8.2%), and cancer (undergoing treatment; 1.0%). Overall, 460 participants who had an MSK condition also reported at least one other medical condition.

The geographical distribution of MSK Hubs can be seen in *Figure 5,* which shows hubs distributed across England, Scotland and Wales. Participants travelled a range of distances from their home address to the leisure facility delivering MSK Hubs with 1.1-2km the most common (22.95%), followed by up to 1km (18.4%) and 5.1-10.0km (18.2%) (Table 4). With participants coming from across the range of deprivation areas with a larger proportion of participants living in more affluent areas (Figure 6). Although sites located in areas of greater deprivation were initially targeted (see Project set up), higher engagement from affluent areas likely reflects the expansion of this product to multi-site operators who wanted to target a broader range of individuals in further areas.

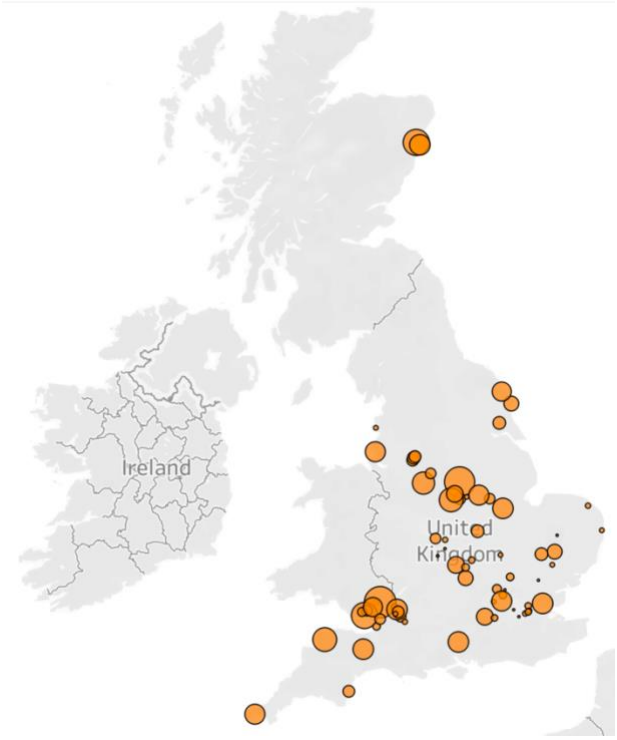

Table 4. Distance breakdown participants travelled to MSK Hubs facilities.

Distance travelled	n	%
0 – 1.0km	285	18.4%
1.1 – 2.0km	354	22.9%
2.1 – 3.0km	222	14.4%
3.1 – 4.0km	155	10.0%
4.1 – 5.0km	102	6.6%
5.1 – 10.0km	281	18.2%
10.1 – 20.0km	125	8.1%
Over 20km	22	1.4%

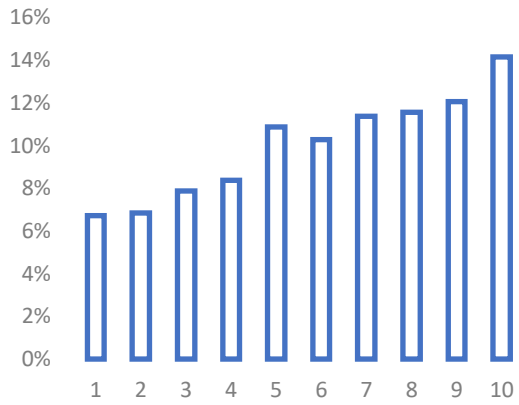

Figure 6. Index of multiple deprivation of participants at baseline (n=1,400). 1 = least affluent/most deprived; 10 = most affluent/least deprived.

A range of routes into the MSK Hubs were used, determined through self-report questions from participants (Table 5). The most popular route to entry was directly through the leisure centre, suggesting that participants who took part already attended these facilities as members or through other exercise referral routes. However, local links through healthcare and word of mouth were other popular routes into the programme also indicating that where established these links can also aid individuals to access localised rehabilitation support.

Table 5. How participants heard about MSK Hubs.

	N	%
GP or Physio	278	18.1%
Leisure Centre	700	45.7%
Other	162	10.6%
Poster or Leaflet	58	3.8%
Social Prescriber	106	6.9%
Word of mouth	229	14.9%

Participants initial registration route followed a similar pattern to that of the facilities delivering MSK Hubs in that many participants first registered with Good Boost and their water and land offers.

Activity participation

As reported in Table 2, a total of 11,785 sessions were participated in by 1,631 participants. This means that on average each participant took part in 7.2 sessions. The average length of time from initial MSK Hubs attendance to their last MSK Hubs attendance was 7.4 weeks, with a maximum of 63.0 weeks.

It was hypothesised that due to the data cut off point in December 2023, this average attendance was truncated due to the evaluation timelines rather than participants stopping their participation. To test this hypothesis, we removed participants who attended their first session in November or December 2023. This changed the average number of sessions participated in to 8.0 sessions with an average length of time engaged to 8.6 weeks. This could still be an underestimation due to the cut off of data for this report and continued research will explore this over a greater period of time.

Using the full data set, the breakdown of participation into those that attended for less than six-weeks, and those that attended for between six and 12 weeks, 13 and 26 weeks, 27 and 52 weeks, and more than 52 weeks can be seen in Figure 7. This allows us to understand how long participants stayed and the total number of sessions they took part in.

The majority of participants took part in MSK Hubs for less than six-weeks, attending 2,543 sessions at an average of 2.5 sessions per participant. In line with the data cut off hypothesis above, removing participants who started their participation in November and December 2023 revealed that the majority of participants still took part for less than six-weeks. Using the full data set, approximately the same number of sessions (2,343) were participated in by those who took part for between weeks six and 12, this was from just 261 participants at an average of 9.0 sessions per participant. The average number of sessions participants took part in increased as time progressed and can be seen in Figure 8. Appendix 1 provides a demographic breakdown for participants at less than six-weeks and six to 12-weeks of participation.

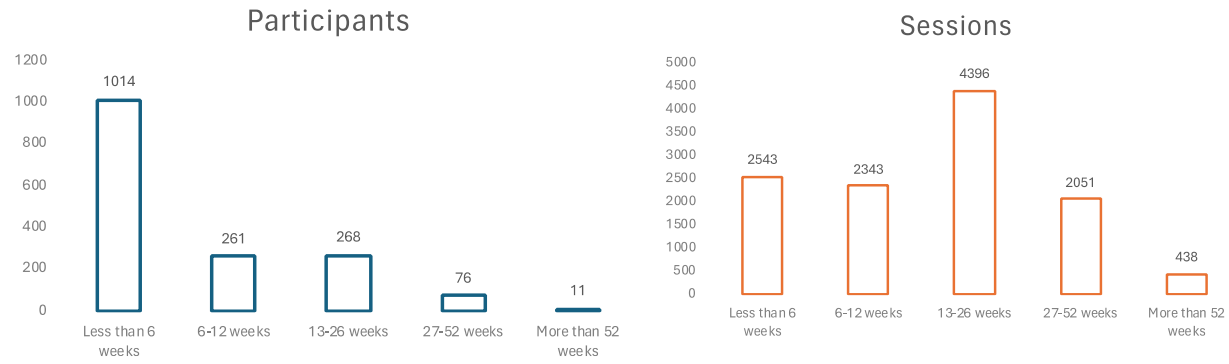

Figure 7. Total participants and sessions over time.

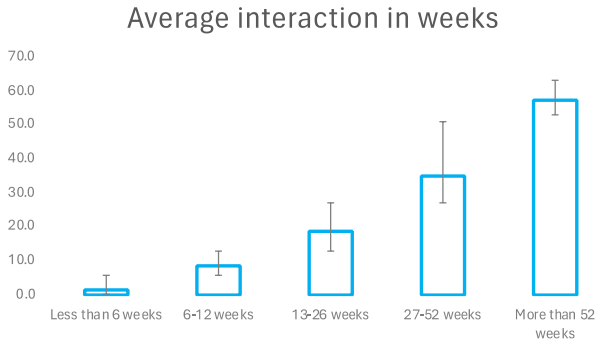

Figure 8. Average and range of participant session interaction.

Outcomes

Outcomes data for physical activity levels (IPAQ-S), wellbeing (ONS-4), MSK related pain and medical condition are collected at baseline (a participants first interaction) and at set timepoints after this initial interaction. Data was collected on an ongoing basis depending on a participant's engagement with MSK Hubs. Sample sizes are provided to highlight the number of participants who have provided data at each point.

Physical activity

Physical activity data was collected via the IPAQ. Data was only collected at baseline and was intended to be asked again at 6, 12, 26 and 52 weeks after baseline. However, due to an error in an updated version of the app this failed to be asked from the participants during a three-month period between September and November 2023. The repair and release of a fixed version of the API and App was completed in January 2024 and data collection restarted as expected. Due to this break in data collection, the follow-up data for the IPAQ was inconsistent and could not be used in the final evaluation. Reason for lost data could have been identified earlier if a monthly data review was conducted and analysed, initially the three-months was felt sufficient as the evaluation remained a manual process.

Baseline physical activity data was collected from 1,205 participants and indicated that MSK Hubs is engaging participants who do not take part in sufficient levels of activity. When categorised, 42.1%

(n=507) were moderately active with a further 39.8% (n=479) classified as having low levels of activity. Only 18.2% (n=219) were classified as having high levels of physical activity.

The baseline MET-minutes/week indicate that walking is where most of the activity was undertaken, with almost no vigorous activity participated in (Figure 9). The inter-quartile range (IQR) bars either side of the median value show the variability in the data, in other words, there is a range in activity participation, especially for total physical activity. Sitting time shows that participants sat for an average of 120 minutes per day.

Feedback from the sub-sample of participants spoken to through the Action Arthritis community groups highlighted that the physical activity participation had increased their range of mobility, even if the quantity of physical activity did not change drastically. Increased levels of mobility meant individuals had more independence and capability to do regularly daily activities, and more confidence to move more than they did previously.

"I've got more mobility, I can't walk a lot still but I can actually move around now and can even tidy my house. I'm able to do a lot more on my own that I used to be able to. Previously I couldn't really stand at all, but now I can stand for an hour before I have to sit down. My granddaughter and I tidy up the house together, we make it into a game. Before we used to just sit and watch tv when she came round but now we do lots more." – MSK Hubs participant

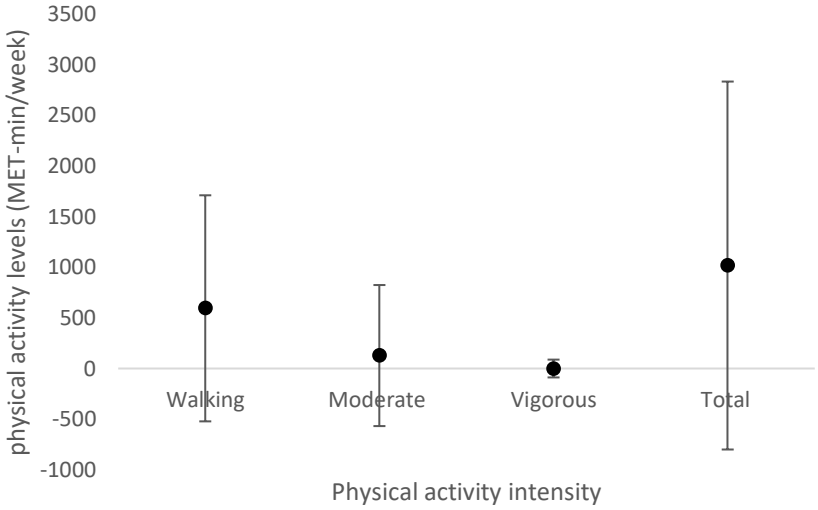

Figure 9. Median and inter-quartile range (IQR) values for the three activity classifications and total physical activity at baseline.

Wellbeing

Wellbeing data (Table 6) used the four ONS personal wellbeing domains. It shows that levels of satisfaction, feelings of worthwhile and happiness were high or very high at baseline and remained that way at the 6-week and 12-week follow up time point. Levels of anxiety also appeared to reduce slightly from baseline at the 6-week and 12-week follow up.

To understand how time influenced the wellbeing data, statistical analyses using one-way repeated measures ANOVAs were undertaken. This used a sample of 171 participants who provided baseline, six-weeks and 12-weeks data for all four of the wellbeing measures. The area of wellbeing that changed significantly was satisfactions scores, which were statistically significant at the different time points ($F(1.78, 301.98) = 4.524$, $p<0.05$, generalised eta squared = 0.011), but specifically between

baseline (0) and 12 weeks (Bonferroni adjustment, $p < 0.05$). For feelings of worthwhile, happiness or anxiety, no statistically significant differences across time where seen, indicating that while these scores remained high, they did not change enough over time to be considered statistically significant changes.

Although not captured across time, individuals specifically noted through conversations that the social element of the MSK Hubs – through the community group session and interacting with leisure facility staff or other users – had a positive impact on their wellbeing, and thus enjoyment, of using the product. They highlighted the value of these types of sessions alongside the structure of Good Boost or ESCAPE-pain delivery, described in more detail in the learnings section of this report.

"I like how it gets me out, and to be able to communicate with others. In the coffee mornings there are a little group of us, and I really enjoy the social aspect of it. We have great conversations about all of it, our problems". – MSK Hubs participant (Arthritis community group)

Table 6. Baseline, 6-week, and 12-week ONS-4 classifications.

Satisfaction						
	Baseline (n=1529)		6-weeks (n=467)		12-weeks (n=248)	
Classification	n	%	n	%	n	%
Low	257	16.8%	41	8.8%	20	8.1%
Medium	372	24.3%	107	22.9%	56	22.6%
High	535	35.0%	225	48.2%	112	45.2%
Very high	365	23.9%	94	20.1%	60	24.2%
Worthwhile						
	Baseline (n=1529)		6-weeks (n=467)		12-weeks (n=248)	
Classification	n	%	n	%	n	%
Low	157	10.3%	30	6.4%	16	6.5%
Medium	288	18.8%	87	18.6%	47	19.0%
High	545	35.6%	204	43.7%	101	40.7%
Very high	539	35.3%	146	31.3%	84	33.9%
Happiness						
	Baseline (n=1529)		6-weeks (n=467)		12-weeks (n=248)	
Classification	n	%	n	%	n	%
Low	234	15.3%	44	9.4%	29	11.7%
Medium	303	19.8%	89	19.1%	45	18.1%
High	518	33.9%	186	39.8%	107	43.1%
Very high	474	31.0%	148	31.7%	67	27.0%
Anxiety*						
	Baseline (n=1529)		6-weeks (n=467)		12-weeks (n=248)	
Classification	n	%	n	%	n	%
Very low	331	21.6%	102	21.8%	46	18.5%
Low	284	18.6%	99	21.2%	62	25.0%
Medium	286	18.7%	113	24.2%	55	22.2%
High	628	41.1%	153	32.8%	85	34.3%

*Anxiety has a reverse scoring convention (a low score is positive)

Primary body pain

Primary body pain data was determined by taking the first body region that the users entered into the system, which is assumed to be their main body part complaint.

At baseline localised pain at the knee was the most commonly cited area of pain, with whole body also a common pain complaint. A full breakdown of the body part pain scores are provided in (Table 7) for baseline, with the 'maximum pain' scores ranging from 0 to 100 for each body part. For specific conditions, the top four reported were osteoarthritis (n=345), other (n=95, with no further information provided), fibromyalgia (n=68), and inflammatory arthritis (n=64). Overall 445 participants did not report a specific condition. The pain score ranges for conditions are within those reported for the specific body parts. Participants were asked the length of time they had been experiencing the pain and in the vast majority of cases this was for more than 24-weeks, the longest time they could select.

Follow up pain data was collected from participants interacting with MSK Hubs. Data presented in Table 7 shows the follow up pain scores between baseline and both six and 12-weeks. When comparing the Patient Specific Complaint (PSC) scores to baseline for each body part, the scores at six and 12-weeks are higher. However, looking at the mean change we saw an increase of 10.3 at six-weeks compared to baseline, and a reduction of -8.8 at 12-weeks compared to baseline.

Table 7. Follow up pain data at six-weeks and 12-weeks.

Baseline	n=1,312				
Body part	n	Av. PSC score	Av. Benefit of exercise[#]	Av. Max Pain	Av Pain
Hip	188	63.4		48.0	43.9
Knee	426	62.9		46.8	42.7
Lower back	269	60.7		49.1	45.1
Shoulder	109	60.3		40.7	37.6
Whole body	320	66.6		52.2	48.1
6 weeks	n=435				
Body part	n	Av. PSC score	Av. Benefit of exercise	Av. Max Pain	Av Pain
Hip	63	55.2	35.0	44.6	43.2
Knee	148	58.1	32.4	46.7	45.2
Lower back	87	55.7	31.4	47.7	45.6
Shoulder	31	53.8	33.2	51.4	49.9
Whole body	106	55.7	24.9	48.8	48.3
12 weeks	n=252				
Body part	n	Av. PSC score	Av. Benefit of exercise	Av. Max Pain	Av Pain
Hip	30	65.1	37.0	53.3	54.2
Knee	89	55.1	30.0	45.7	44.7
Lower back	52	57.1	32.5	51.9	48.6
Shoulder	16	50.4	27.3	50.6	46.3
Whole body	65	60.6	22.4	53.5	53.3

PSC = Patient Specific Complaint. [#]Average benefit of exercise collected at follow up only.

For the maximum and average pain experienced over the last 7 days, Table 8 and Table 9 provide additional analysis overall. This indicates that both average pain and maximum pain over the 7 days saw no change from baseline at 6-weeks or 12-weeks.

It has been documented that a 15% decrease in pain is sufficient for a person with MSK condition related pain to feel a noticeable improvement in, which is termed Minimal Clinically Important Difference (MCID)[23]. Follow up data at six and 12-weeks revealed that this threshold was met by between a third and two-fifths of the sample providing data, depending on the pain measure and time point.

Table 8. Average pain change from baseline at six and 12-week follow up.

	n	Mean change	Standard deviation	Lower 95% CI	Upper 95% CI	MCID (n)	% with MCID
6 weeks	425	0.61	24.04	-1.67	2.90	162	38.1%
12 weeks	246	2.46	25.44	-0.72	5.64	108	43.9%

Table 9. Max pain change from baseline at six and 12-week follow up.

	n	Mean change	Standard deviation	Lower 95% CI	Upper 95% CI	MCID (n)	% with MCID
6 weeks	425	-2.42	23.55	-4.66	-0.18	138	32.5%
12 weeks	246	-0.34	24.74	-3.43	2.75	94	38.2%

Finally, regarding pain data, participants were asked to rate their global pain improvement at six and 12-weeks. Figure 10 and Figure 11 present this data for these follow up time points for each body part. This suggests that although scores presented above were only changing slightly, participants felt their participation in MSK Hubs was leading to improved pain, more so at 12-weeks compared to six-weeks.

[23] Salaffi, F., Stancati, A., Silvestri, C. A., Ciapetti, A., & Grassi, W. (2004). Minimal clinically important changes in chronic musculoskeletal pain intensity measured on a numerical rating scale. *European journal of pain (London, England)*, *8*(4), 283–291. https://doi.org/10.1016/j.ejpain.2003.09.004

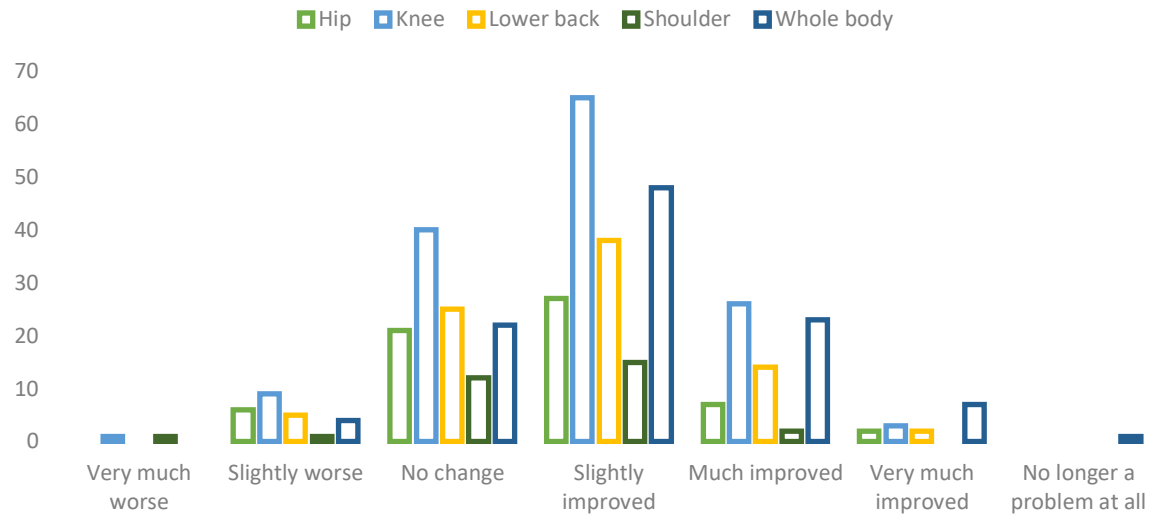

Figure 10. Global overall feeling of improvement at six-weeks per body part.

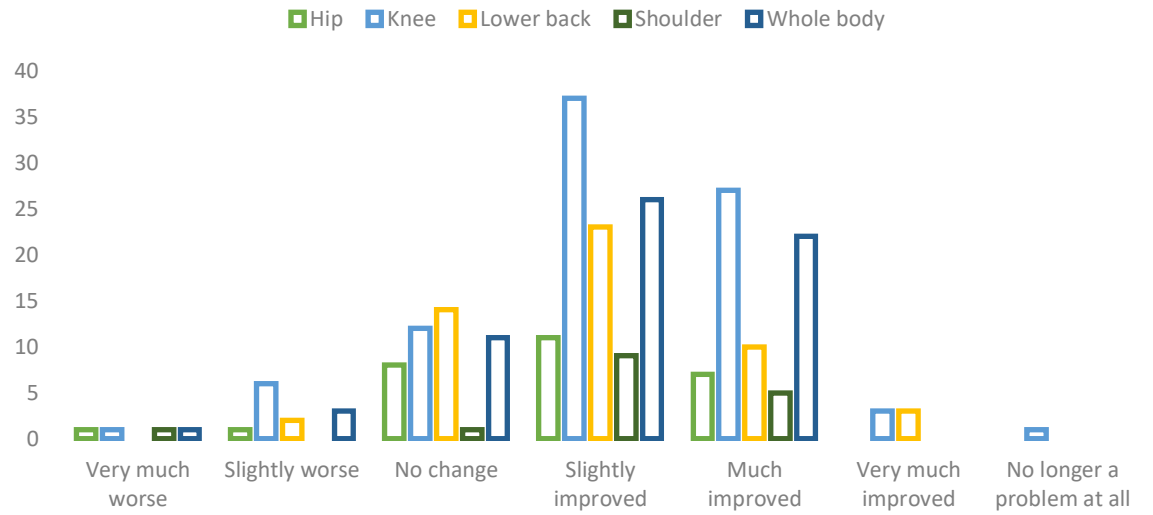

Figure 11. Global overall feeling of improvement at 12-weeks per body part.

Qualitative feedback from individuals indicates that the elements of the MSK Hubs product had positive impacts on their pain management, with some noting increased mobility coupled with less pain and a reduction in use of pain medication. This was the case for individuals who engaged with the Arthritis Action self-management content, the ESCAPE-pain self-management programme and the individualised Good Boost exercises. Each of these supported individuals to manage their pain in different ways – the latter two provided structured physical activity which could be done individually or led by a trained professional, depending on individual preference. Arthritis Action and ESCAPE-pain then also provided key educational elements and opportunities for social support allowing individuals to discuss their experiences, learn from others and manage the emotional impacts of their condition in a group setting.

"I take less tablets now for pain, and I don't need to take them in advance of going to the pool. I take them three times a day now rather than five times before. Yes, now as well as the exercise I also play darts. I always used to go but couldn't play because of my shoulders and because it was painful, but I

can actually play again now. I'm going to start playing bowls soon too!" - MSK Hubs participant (Arthritis community group)

"From taking part in [ESCAPE-pain], I feel as though I am more mobile with much less pain. My confidence has improved to start doing some more jobs and trying to get back into my hobbies that I enjoy. I am now going to look into maintaining an exercise regime to keep me active and mobile" – MSK Hubs participant (ESCAPE-pain)

Wider leisure centre usage

To understand how participants of MSK Hubs interacted with the facility delivering MSK Hubs, we partnered with 4GLOBAL. Utilising 4GLOBAL's DataHub platform, which offers operational and financial performance intelligence to facility operators, local authorities, and governing bodies, we were able to match MSK Hubs participants with leisure centre users within the DataHub.

Of the 1,631 MSK Hubs participants, 921 leisure centre records were matched from seven of the 15 operators delivering MSK Hubs. From here we were able to look at the leisure centre participation of these users from September 2022 (when MSK Hubs delivery began) to December 2023 (when data was cut off for this report). We were also able to look at participation at the MSK Hubs facility participants registered at (home MSK Hub), and activity at other facilities (non-home MSK Hub) within the DataHub.

Table 10 shows the leisure centre usage by operator who delivered the MSK Hub where a participant registered, at the home and non-home MSK Hub. In total, the 921 participants took part in 44,038 activities within a leisure centre, showing activity both at the home MSK Hub and non-home MSK Hub. Of the 921 participants, 623 took part in their first leisure centre activity after MSK Hubs delivery had started in September 2022, with 147 participating in their first leisure centre activity after their first MSK Hub session. These 147 took part in 2,026 activities at an average of 13.8 leisure centre visits per person. Overall, 24 different types of activity were participated in (Table 11) with swimming, group workout, and general access the most popular activities across the operators.

Table 10. Leisure centre usage by MSK Hub operator at the home and non-home MSK Hub facility.

Operator	MSK Hub sites	MSK Hub unique participants	DataHub unique participants	Home MSK Hub session participation	Non-Home MSK Hub session participation	Total session participation
GLL	6	93	57	1,685	19	1,704
Legacy Leisure	6	155	99	2,799	13	2,812
Lex Leisure	7	122	70	3,588	283	3,871
MyTime Active	1	10	7	596	0	596
Parkwood	9	271	179	5,650	124	5,774
Everyone Active	27	589	464	27,087	1,675	28,762
Abbeycroft Leisure	3	55	45	517	2	519
Total	**59**	**1,295**	**921**	**41,922**	**2,116**	**44,038**

Table 11. Leisure centre activity participation from 4GLOBAL's DataHub, by MSK Hub operator.

Activity	Abbeycroft Leisure	Everyone Active	GLL	Legacy Leisure	Lex Leisure	MyTime Active	Parkwood	Activity Total
10 Pin Bowling		3						3
60+ Activities			43			53		96
Badminton		86		2			5	93
Bowls		15						15
Children Programmes	3	69			60		2	134
Climbing		2						2
Cricket		86						86
Cycling					2			2
Dance		3						3
Fitness	60	1,509	43	164	27	3	82	1,888
General Access		3,556	43	485	1,651	122	1,261	7,118
Group Workout	302	2,505	909	1,090	680	201	2,828	8,515
Gymnastics		1			1			2
Health and Wellbeing	24	4,386	51		2	212	9	4,684
Martial Arts		42					3	45
Multi Sports Programmes		11						11
Netball							18	18
Other Services		4,716	1	11	35		6	4,769
Squash				3	1			4
Swimming	94	10,020	450	1,043	1,127	5	1,435	14,174
Table Tennis			1					1
Tennis		29						29
Unknown	34	36	144		2		1	217
Virtual		12		1				13
Total	**517**	**27,087**	**1,685**	**2,799**	**3,588**	**596**	**5,650**	**41,922**

When looking at participation in MSK Hubs plotted against home MSK Hub facility use there was a general positive trend that indicated greater participation in MSK Hubs also saw greater usage of facilities (and vice-versa) (Figure 12). There were some participants that had very high facility usage however the majority of participant used facilities less than 100 times in the date window.

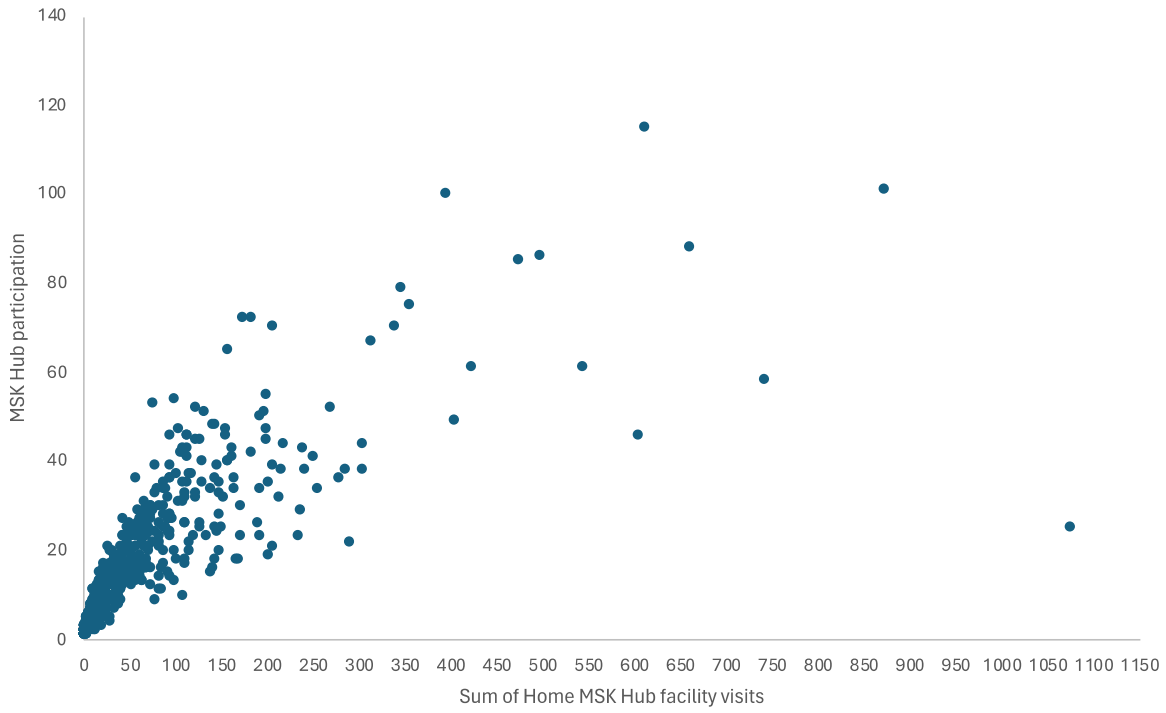

Figure 12. Scatter plot of MSK Hubs participation and wider home MSK Hub leisure centre visits by MSK Hub participants.

Social Value

Social Value is the term used for the health, wellbeing, educational and social benefits experienced by people, communities, and society through physical activity[24]. The 4GLOBAL Social Value Calculator provides leisure operators, local authorities, national funding bodies, and stakeholders a way of measuring and providing evidence for the Social Value created from investment in sport and physical activity[24]. This calculates social value by overlaying facility data with several lifestyle, social segmentation, and risk assessment factors at both the individual and household level in order to determine the impact of the facility on individual health outcomes (physical and mental health) and community outcomes (education and crime rates)[24]. It has been developed using evidence-based academic research and sector-wide benchmarks to provide a tool to predict, track and evidence the impact of sports and physical activity offered in operators facilities. By using the Predictive Social Value calculator, the estimated social value can be generated from investments or programmes to inform future decisions[25].

Data from 1,509 participants was inputted into 4GLOBAL's predictive Social Value Calculator. This estimated a total Social Value by participants taking part in MSK Hubs of £622,557 or £413 per participant. The total Social Value was made up of the below values across the four indicators:

- Physical and mental health: £254,478
- Subjective Wellbeing: £252,464
- Individual development: £560

[24] 4GLOBAL. Make social impact your most compelling business case. https://4global.com/app/uploads/2023/08/4Global_SocialValueCalc_03.pdf
[25] 4GLOBAL. (2024). Social value calculator. https://4global.com/product/social-value-calculator-2/#:~:text=Developed%20in%20partnership%20with%20Sheffield,they%20offer%20in%20their%20facilities.

- Social and community development: £115,055

It was estimated by the Social Value Calculator that, based on participant activity levels, average annual session attendance, and the per-person cost of delivering a session, every £1 invested in delivery would generate £5.30 in Social Value.

Learnings

Given the nature of an industrial research project the project team aimed to ensure there was an ongoing process of learning, adaptation, and development, to ensure the MSK Hubs product was fit for purpose and evolved over time to meet needs and improve efficiency, and to deliver and scale the MSK Hubs product more effectively. Learnings have been collated into the key areas below highlighting successes, challenges, areas for adaptation and improvement.

Operations

Here operations refer to: communication (internal), project management (including planning, resources, and meetings), and implementation (including blueprints and standardisation). Each are discussed in turn.

Communication (internal)

Putting in place a continuous communication loop, through the form of weekly update meetings, between the project partners was deemed as essential to learning, adapting, and progressing the development of the MSK Hubs. All project partners felt this helped build up rapport between one another and aid in uncovering and solving challenges collectively.

"Being in constant communication with project partners has allowed us to [adapt the project were necessary]. For example [renaming and repurposing the] coffee morning chats to suit the sites and centres who do not have cafe areas, adapting the marketing. [Also], what we learnt in phase one, what we learnt phase two, allowed us to kind of keep up with the need of the industry and adapt the operations [dependent on what] the sites can offer, [based on their] staff, space, [available facilities]. All of those are working well due to our relationship with the project partners, and how we've kind of kept that frequency of communication and changed to meet the need of what we've learned." - member of MSK hubs consortium project team.

Nonetheless all also agreed that the communication loops about progress on alterations, interactions and feedback from operators and expectations about each project partners role needed to be improved to aid efficiency. For example, several project partners were unaware of all the services that made up the MSK Hubs. This denotes a need to ensure that a clear rationale and fact sheet exists demonstrating what each product involves and why it is relevant for such a complex project, and that this is then viewed and understood by all partners.

In another example, there were cases of miscommunication between project partners regarding the interest or feedback from operators about taking on different aspects of the MSK Hubs (e.g. training, interest in individual products), which led to delays in or limited implementation in some sites. This requires better communication between project partners to close the feedback loop between partners and operators.

Project management

Overall project management collectively for the purpose of the MSK Hubs was an area that all project partners felt was lacking as part of the project. The lack of this was in part due to resource and capacity across teams, no specific funding for this role, and lack of a collective decision on whose role this was within the present consortium.

It was felt many of the challenges faced with communication, planning, and being held accountable to deliver actions, would have been solved with a dedicated project manager to oversee the project timeline, deliverables, risks and issues. For example, the consortium felt the weekly partner meeting were extremely valuable because they acted as that centralised point of contact. However, they also noted that sometimes the content was repetitive, and it was unclear whether actions had been completed, likely due to no one being in the role of holding the delivery of actions to account.

" [The project] did not have a designated person who was making sure the moving parts were in line and in sync, who had the ability to go in and chase up unmet actions from different project partners. In the project, we want to be able to see much early on the behaviours and the positives, things are going well, and [also] things that need much more of our attention and time. [I think a person who was assigned to oversee all of that, for the product as a collective, would have helped]." - member of MSK hubs consortium project team.

It was also felt that a dedicated project manager would be able to support with creating and keeping relevant documentation, resources and planning up to date, because of having the capacity to effectively utilise project management tools. This would aid with the challenge around lack of awareness of different partner products, and allow better coordination of how resources were used, shared, and communicated to external partners and operators.

"I think we do need that overarching coordination and someone that can pull together those project initiation documents, so that if people are onboarded in the team halfway through, they have all the documentation that they need, and we all have agreed and collectively set up those kind of KPIs, even if they're just internal ones, to keep us on track." - member of MSK hubs consortium project team.

One of the challenges noted was that there were too many project resources, which, while providing a lot of detail, had the potential to overwhelm operators and providers and did not all sit in the same centralised location. As part of the planning process going forward, it was agreed that having a single place in which all operational documents and resources sat, and this should be coordinated by a project manager. This would aid with delivery and the coordination of questions and requirements from operators.

"I think it would have benefited to understand a bit more about the other [operational aspects] of the different products across the project and how those things work right down to the delivery and operational detail. I was being asked frequently on training or how to charge for Good Boost sessions. I [didn't] have that information, and I think it's okay not to know those answers but [if I knew where to find those answers] I think it would just appear that we were a little bit more unified." - member of MSK hubs consortium project team.

Implementation

This was the first time implementing the MSK Hubs model, and the process came with multiple learnings. The consortium partners all agreed that the roll out to 100 sites across the span of a year was a huge success, as was the engagement with, and onboarding of, operators (discussed in more

detail under *Delivery*. As the onboarding and delivery start times varied from operator to operator this impacted the start date and implementation of data capture through the tablets, meaning that some data capture was limited for certain parts of the product (e.g. for ESCAPE-pain).

The iterative learning process and adaptations that were made to the roll out of the MSK Hubs product ensured that it was possible to have staggered implementation start times per operator(s) and speaks to the importance of continuous process of learning and adaptation going forward.

"It's positive how quickly we've been able to learn. The project started September 2022, and that ability to adapt and reflect and say we need some really pull our fingers out, that's a learning. That pre-emptive planning is needed, to understand what will we need to do this? There's been nothing done like this really is a blueprint for this. I think that is part of the research project." – member of MSK hubs consortium project team

Despite the improvements required around communication and project management, the successful implementation of the product into operator sites, and its expansion into operators' multi-sites beyond the initial mapped locations, demonstrates that it is feasible to implement the MSK Hubs model in a leisure centre setting. One of the reflections as to why it was feasible was the flexibility offered as part of the delivery, onboarding and roll out. This allowed operators to individualise the product based on their needs and individual site requirements, something that would not have worked had there been a rigid process for implementation. However, in some cases there was initially high interest, but it took time to secure buy-in, train staff, and begin delivery.

"A success that needs to be continued is making sure the leisure centre chooses what's right for them. What went well is the fact that we didn't say [operators had to] take all the elements, because that wasn't feasible for every single leisure centre. Every leisure centre, and every council works in a different way, so it's really about showing them what the options are and making sure it's the right solution for them." - member of MSK hubs consortium project team.

However, alongside the flexibility it was noted that a more structured blueprint of how to implement the MSK Hubs product needed to be developed, both for the ease of the consortium partners to support operators, and to hold the operators to account, in implementing the product. It was agreed that this blueprint would also better support the operators in building the relationships with local health that were essential to ensuring a smooth referral pathway from a clinical setting into the leisure setting, and throughput on the programme.

"[There is a need for an] operational blueprint, [to highlight the local] active partnership contact, types of NARS groups and PCNs, and other groups that [operators] should be contacting. Some centres [know who to contact], but some smaller centres don't have those leads and connections, [so it's harder for them]. It's going right back to basics thinking that they know nothing so the centres that don't know anything have got that support and the centres that have it already, they don't need to use it. I think building up that to create those connections is really important moving forward." - member of MSK hubs consortium project team

Specifically, an operational blueprint would include timelines for launching, messaging and branding for marketing, requirements and instructions on how to launch, guidance and best practice on integrating with local health, guidance on data collection, and an overall engagement plan for engaging harder to reach demographic audiences. It was identified that while the data collected indicates that the MSK Hubs product is both feasible and able to engage individuals in the local community, in order to improve access for all individuals, more focus needs to be made going forward

on engaging those who currently do not use the product, and improve representation of those from ethnically diverse backgrounds, with disabilities and located in more deprived areas.

Alongside the blueprint, another next step identified was adopting standardising and kitemarking of what an MSK Hub is, and therefore what operators *have* to implement in order to be able to say they are running the 'MSK Hubs programme' at their site(s). It was agreed that clearer messaging of the minimum standard(s) required was needed – through continuous and better use of the ukactive 'The Active Standard' component of the product - as well as the use of mystery shoppers to ensure quality assurance across all sites that took on the MSK Hubs. To further standardisation beyond this, the MSK consortium project team want to look at developing a commercial model and kitemarking system to signify a certain standard of quality and reliability for the product. The kitemarking was considered extremely important as a means of supporting operators' integration with local health and supporting that referral process to using MSK Hubs in a leisure centre, especially if these links were not already in place.

"Moving forward, if we're going to scale this, then [we need] a firmer or clearer messaging of how to launch [as a project team]. Using the learnings [from this project] to set up the optimal ways to launch, and we collate all our findings on what 'constitutes an MSK Hub'. In turn [then we need] a kite marking system, [which] would then nicely lead to having MSK Hub champions. I think before any of that, it's about more leadership engagement - more senior fitness industry leadership engagement pre-launch, with the emphasis, as we've said, on commercial and social dividend. I think if that's done with all the other changes put in place then we'll have a pretty coherent model" - member of MSK hubs consortium project team.

Delivery

Delivery refers to: communication (external), personalisation, reach and partnerships, and marketing and brand awareness. Each are discussed in turn.

Communication (external)

Levels of communication with operators and providers varied dependent on person, partner, and site(s). Some members of the consortium project team were in more regular contact with operators than other members, which was thought to have caused some disconnect and miscommunication to operators of how to implement certain parts of the MSK Hubs product. It was agreed that all consortium project partner leads, or a project manager overseeing everything, needed to have coordinated and direct communication links with operators, so that any challenges specific to their part of the product could be addressed smoothly.

Communication with operators and providers was made as regular as possible. Initially this began with introductory calls, onboarding, and training, including both senior leadership and site level staff. Once delivery commenced in sites, these migrated into catch-up calls. Communication was most effective at this stage when done regularly with those involved in local delivery, such as regional and site managers, or those specifically responsible for the site management of the MSK Hubs (e.g. MSK Hub campions). These check points were useful both to address challenges, questions, and feedback, and to ensure MSK Hubs was not forgotten amid the wide variety of things happening, and being delivered, at the leisure centre.

Personalisation

One of the perceived successes of the MSK Hubs product was that it allowed an element of personalisation to occur, both for individuals using the product and for operators delivering the product, who could adapt it to suit the needs of their site. The personalisation began, however, with the onboarding of operators, where webinars were targeted towards specific operator needs, and acted as an effective way of building relationships, setting expectations, and sharing the knowledge needed. This was particularly helpful in the long term for The Active Standard element of the product, as it ensured buy in for uploading accreditation information and completing and passing the accreditation. Another success was the project team's ability to cater to the schedules of the operators, by adapting the timings of the training to fit around the agendas of the leisure centre staff which ensured higher attendance.

Nonetheless, this flexibility also meant increased time spent by the consortium project partners in re-arranging meetings and developing bespoke content. It was agreed that a balance between semi-personalised content, and meetings that catered towards three to four operators, rather than one, was more effective time versus impact approach.

Reach and Partnerships

As part of the project the MSK Hubs was given a target of reaching and onboarding 100 sites. Not only was this target achieved, given the timescales, 15 of these were onboarded over a three-month period in 2022 in Phase 1, with the remaining 85 engaged in Phase two throughout 2023.

Forging this many relationships and implementing the product in such a short period of time demonstrates the potential scale the product could have, if scaled up further. One of the reasons for this success was thought to be the blueprint of the product itself, as a 'ready-made' offer which addressed many of the obstacles that are faced when implementing new products in a leisure facility setting. Operators could easily implement the model without changing it if they wanted to and adapt where relevant or needed. For some, implementing the MSK Hubs was to run alongside existing exercise referral programmes and activity classes they already provided, and for others it acted as a catalyst for expanding the health and wellbeing services available. Case studies of how MSK Hubs was implemented are shown in Appendices 2 and 3.

"What was appealing about the MSK Hubs for these leisure operators is [that it was like] a blueprint of how to [do MSK Hubs], it was a purpose-built programme they could just take. Is our facility, right? Yes, The Active Standard accreditation told us our facility was right. We don't have GP level staff yet or the various qualifications in [our staff] but that's okay, Good Boost doesn't [require] that. People want to have conversations and engage with others with a similar condition - here's Arthritis Action. And now that you've got the GP level three staff, here's ESCAPE-pain programme to create that bespoke programming. Then what we [have started to see] is operators have expanded [their health and wellbeing offerings] off of it. The vast majority of the centres were trying to prove concept from a return on investment and sustainability point of view and were doing that by charging a drop-in rate. [Operators have] realised that not only are these people coming and consistently paying the drop-in rate, but they're also taking out memberships. So [many] operators are now looking at what that health and wellbeing offering or membership includes, and quite often the MSK products are part of that offering." - member of MSK Hubs consortium project team

Onboarding and training relevant on-site leisure staff, such as those facilitating the Action Arthritis Community Groups, was another success as it helped to dispel fears or doubts about supporting

individuals with MSK conditions, and instil confidence in these staff to not only facilitate the group sessions, but to also have conversations about pain management, mental health, and other suitable activity offers available in the leisure centre. This demonstrates the importance of the leisure facility staff being involved in the roll out just as much as senior leadership.

"Most [participants] love the groups, especially the social aspect. There are a few who have made friendships as a result and see each other every week even outside the groups. Some have also gone on to do other groups and classes, not just the ones in the MSK hubs project." - leisure centre staff member

Despite this success, noted areas for learning did involve improving director and senior leadership buy in from the offset, to set the agenda and accountability within operator sites to take on and then implement, the MSK Hubs in a time appropriate manner. This includes senior leaders taking a more directive role in ensuring that individuals experiencing the greatest health inequalities (e.g. those of ethnically diverse backgrounds and in less deprived areas) are more specifically targeted through marketing going forward.

Another aim of the MSK Hubs project was to increase the reach into health and help facilitate the connections between local health and local leisure facilities. This was in part the aim of The Active Standard and operators who passed and completed this accreditation felt that it did provide them with a level of professionalism and set standards which they could use when building partnerships with local health links.

"We are pleased to support The Active Standard and ukactive's efforts to enhance referrals from healthcare professionals and bolster the leisure industry. By working closely with The Active Standard and ukactive, we aim to cultivate an experience for each individual seeking to improve their health and wellbeing journey. Our dedication to health and safety protocols not only reflects our professionalism but also underscores our genuine care for those we serve. Together, we are shaping a future where access to quality leisure facilities and expert guidance is readily available to all." – Everyone Active

In other respects, integration with health saw varying success; in one instance, operators and providers who already have connections with local GP clinics or already provided other referral services (e.g. Exercise Referral, Cardiac Rehab) in their sites, were able to use the MSK Hubs product to further strengthen these relationships and increase their integration into local health. However, for those who had fewer existing connections, the same level of integration did not occur, namely because they did not know where to start or how to have conversations in a language that would be well received. Going forward, more could be done by the MSK Hubs consortium project team to facilitate this and offer support to these operators to do this. One way in which the team aims to do this is through the production of the implementation Blueprint (as discussed above).

"We could do more to integrate with health. Operationally on the ground locally we're heavily reliant on the current relationships the operator [has] and the ICS. If they don't have that relationship, [we don't currently give them] all the support they need." - member of the MSK Hubs consortium project team

Marketing and brand awareness

The MSK Hubs product was marketed to be accessible for individuals experiencing any kind of MSK related condition. However, because this was a feasibility pilot, a majority of the marketing was catered towards operators who were provided with the tools to market this to individual customers in the way they chose. For some operators, this involved targeted social media campaigns using relatable phrases and images to attract an older adult target audience.

A further example of where marketing and naming was influential to implementation was the naming of the Arthritis Action Community Groups. Previously called coffee mornings, these groups were an opportunity for individuals to come together at an MSK Hub sessions and socialise. However, the name provided unexpected barriers to delivery to operators who thought this meant coffee had to be served, that a kitchen area needed to be available, or it had to only take place in the mornings. Altering this name not only alleviated these barriers but was a great example of the iterative process and using real time feedback from operators to make rapid changes to better the product.

While marketing and branding were not the focus of this stage of the MSK Hubs project, they are an important part of the implementation and scaling process. Due to resource and limited capacity one consortium project partner led on the development of the existing marketing materials (e.g. brochures and videos). These marketing materials were developed to onboard the operators and providers as they explained the concept of the MSK Hubs. However, in scaling the product it was collectively agreed that more joint marketing and specific MSK Hubs branding was needed, as well as guidelines on how these should be utilised. It was agreed that this would help provide clarity of what 'constitutes' as an MSK Hub to external parties, and customers, and give the product its own identity that was separate from the branding and identity of the consortium project partners. It was also noted that joint marketing assets, materials and brand guidelines would bring the MSK Hubs together as a single product in the minds of the consortium and their role within the product, which would in turn, reflect outwardly as a more cohesive offer.

"I don't think [all the partners clearly] see MSK Hubs as a product. As in [the way we have worked], we are each just [delivering our own services] rather than part of a product. There is [a lack of belonging] to the product. I think [we have all] focused on our own aspects - what's best of each of our services, but not necessarily what is best for the development of MSK Hubs, as a service or product. I don't think it's something that's negative, I think it was just everybody was working on their own understanding of their role in the project." - member of the MSK hubs consortium project team.

Evaluation and Data Collection

Evaluation and data collection involved the adaption and continuous learning, system optimisation, data collection implementation planning and the development of research focused questions and outcomes to guide the evaluation.

Adaptation and continuous learning

Another key success of the MSK Hubs project was the level of, and breadth of data collection. This was because of several things.

The data collection system was purpose-build from scratch, which allowed the infrastructure to be suitable for a 'real-world' data collection environment. This was important because it made the process of data collection more feasible to operators, and less admin-heavy compared to using existing or manual systems, and increased buy in to support it. It also increased level of buy in with end users, because of the gamified nature of the tablet. Despite this, the data collection process was not without its challenges; the time to build the system was considerable and took place in parallel to delivery, which resulted in a reduced level of data collected and relied on the use of retrospective data at the start of the programme. It was agreed that capacity and accurate timelining was needed to prevent this when scaling the programme.

"[Something that was] less effective is it took quite a while to get the actual systems built, and there was an underestimation of the time needed to build all the different components that weren't just the

data collection, but also the provision of the services from the different partners. That took longer than expected, therefore, the data collection didn't start early as we would have expected, and I think some rollout was delayed because of the expectation of waiting for the tech to be ready. Whereas we could have been rolling out and started testing the implementation on the different services or parts of the hub much earlier than we have. So that has delayed some of the data collection volume that we could have done, because there was maybe too much emphasis on waiting for the tech to be ready when it wasn't tech realigned part of the timeline." - member of the MSK hubs consortium project team.

Yet, adopting an approach of continuous test and trial helped to mitigate the challenges, whereby the method for collecting data (the App on the Good Boost tablets) was shaped and developed from feedback from operators, end users and the project team. The ability to alter and update the system code was extremely valuable as it allowed improvements to be made on a regular basis. For example, improvements were made to the dashboard and onboard training for operators. As a result, not only did the evaluation fulfil its requirement for the industrial research project, but over time the system and evaluation grew to incorporate additional elements beyond its initial scope. It had the ability to bring together data from three different services and sources and demonstrated that it was feasible to implement in an operator environment. Other outcome measures, such as qualitative feedback captured through the Arthritis Action community groups, were gradually incorporated to support the quantitative data metrics.

Nonetheless, a learning to consider going forward is the amount of data collection metrics that are needed to inform the evaluation versus the impact this has on delivery and the end user experience of the tablet and overall product. Some feedback was too many questions were asked of end users.

System optimisation

The method for data collection was shaped and developed as part of the project, and now the system has been built there is capacity and scope to optimise use of the system and improve the user journey when moving between the services and exploring the MSK Hubs product as a whole through the technology. It was agreed that were the MSK Hubs to be scaled, the symbiosis between all aspects of the services could be improved, so they operate and feel more like a singular product rather than in separate siloes.

"There are little things that could be done to encourage people to move between the different services. [For example] in the Good Boost section you're asked about your water confidence. If you put that as really low we [can then build the system to go] 'there's also these ESCAPE-pain programme sessions. In the articles from Action Arthritis [there could be references] to Good Boost sessions being great for [certain conditions]. Things like that might reduce that drop off [we see]. Because right now, if someone does a Good Boost session and decides it's not for them, they might just leave. Whereas we could [build the system to go], if you don't like this, try our other services. I don't think [there is much currently] that's really pushing you between the different services, it's just three different services to get offered at the same place. Not necessarily connected." - member of the MSK Hubs consortium project team

It had already been determined that this could be done by a more fluid and accessible feedback loop with users, who could provide feedback through the system to allow it to adapt in a way that works best for their needs. Therefore, the optimisation of the system going forward would look to better personalise individuals own unique journey and to explore how this journey can be continued outside of a leisure setting, when individuals do not have access to the tablet.

The system can also be used to understand better *why* individuals are attending MSK Hubs – what content and parts of the product are engaged with, and why, and what keeps them using the system. This provides the foundation for improving the service and end user experience. It can also help the MSK Hubs be better targeted towards populations who do not currently engage, such as the under represented groups, and therefore look to help reduce health inequalities.

Data Collection Implementation and Research Questions

It was agreed that clearer and more concise research questions need to be developed in any next iteration of the data collection for the MSK Hubs. This would involve relevant members of the research being involved in these conversations from the offset and shaping the research objectives to ensure they were both challenging but also achievable. It would also involve more support and understanding of the data collection from all consortium project partners to support the roll out and collection in operator sites. The initial evaluation outcomes were translated into a framework, which was key in aiding the clarity around what the evaluation was supposed to achieve, and how that was done. In addition, it was clear what metrics needed to be collected, which aided building a system that was fit for purpose.

However, research objectives would have aided this, and having these built in from the very start would have set expectations around capacity versus timelines to launch and the capability of the system to collect certain types of data. To aid this clarity, it was agreed by the research team that a data collection implementation plan needs to be developed, which clearly lays out the research questions, focus, and operational needs. This then needs to be communicated with project partners to allow better internal knowledge of evaluation and ensure that support and buy in was there.

"We planned out what we needed but it might not be so well communicated once we made that plan, with the other partners. There was an assumption that we had agreed everything, and when new people came in or any process developed, we could have [communicated awareness of these changes] in meetings better." - member of the MSK Hubs consortium project team.

Recommendations

Recommendations have been developed based on the delivery, learnings, and results presented. The recommendations have been divided into operations, implementation and reach, and end user experience.

Operations

Recommendation: Dedicated project management

To aid the effective and efficient management of MSK Hubs as a singular product, including the scaling of the product, a dedicated person should be onboarded as part of the MSK Hubs consortium project team, as the dedicated project manager. This person should have responsibility for the oversight of the project, including management of operational meetings, timelines and holding internal and external partners to account for actioning deliverables.

Recommendation: Prioritise internal communication

To support smooth operations and delivery, including the onboarding, upskilling, and training of operators there should be improvement in the communication loops between the MSK Hubs project partners, and should be prioritised. This should involve the use of relevant project management tools which outline the role of each partner and detail the process through which project partners communicate with operators about their, and other, parts of the MSK Hubs product.

Recommendation: Investment into workforce upskilling

To ensure that operators have the relevant capacity and skill set to deliver the MSK Hubs product at scale, investments should be made into upskilling the fitness and leisure sector workforce through training and competence programmes. This should include improving access to these opportunities and the recognition that this workforce is an extension of the public health workforce. This will be crucial to enable more physical activity providers and practitioners to support healthcare.

Implementation

Recommendation: Produce an operational blueprint

To support the implementation and quality assurance of the MSK Hubs product at operator site(s) it is necessary to produce an operational blueprint. This blueprint should provide structure on timelines for launching, marketing branding and messaging, requirements for launching and an overall plan for engaging harder to reach audiences, such as those from areas of higher deprivation, of ethnically diverse backgrounds and with disabilities. Specific to delivery, it should also specify how to engage HCPs and develop partnerships for securing and improving referral pathways. This blueprint should also include requirements of The Active Standard and minimum requirements to constitute as an MSK Hubs to ensure standardisation and kitemarking, and to signify a certain standard of quality and reliability for the product.

Recommendation: Integration with health

To extend the reach of the MSK Hubs product across the leisure sector, and support the scaling and access of the product for those most in need (targeting health inequalities), the MSK Hubs consortium project partners should prioritise the integration of health into the operators who are currently running the MSK Hubs, alongside any future operators onboarded. In the first instance, this should include ensuring there is a dedicated component in any operational blueprint focusing on this, with ample resources for operators of how to forge connections with their local HCPs and which health groups and bodies to approach to begin and continue the relationship building process. However, the second component should be ongoing work by members of the consortium to ensure these operators are considered as parts of local healthcare systems. Specifically, this involves not just interlinking with the hospital pathway, but linking to voluntary, community, faith community organisations and social care providers to enable personalised choice and the best possible care for people to manage a broad range of MSK conditions. This aligns with the NHS's ambitions to provide care in a more integrated way across health, social care and public health.

Recommendation: Develop specific MSK Hubs brand and marketing assets

To support the promotion of the MSK Hubs as a singular product it is necessary to develop joint marketing assets, website, materials, and brand guidelines. This is especially important for the scalability to more locations and for targeting populations most in need.

End User Experience and Impact

Recommendation: Continued evolution and refinement of MSK Hubs to meet health needs

To continue the development of the MSK Hubs product and to understand the impact it has on the health outcomes of the individuals taking part, continuous refinement of the MSK Hubs tablets, as well as the content being provided by all project partners should take place. This should involve an improved feedback process from the end users of the product, to understand how use of the technology and inputting data metrics impacts the end user experience, and who does and does not use the product.

Recommendation: Advancement in research approach

The data collection of agreed health outcome metrics should be continued to grow both the size and validity of the present data collected. Continued data collection should assess the impact on health outcomes over time and understand the overall impact of the MSK Hubs product on those using it, as well as, where relevant, integrating additional elements centred on understanding the social and financial value of the product for the leisure centres and operators who run it.

Recommendation: Focus on populations most in need of support to help reduce health inequalities

To ensure the MSK Hubs product better services the population in most need of the support it provides, and that it plays a role in reducing health inequalities, future focus of the MSK Hubs project partners should be extending the reach of the product to these populations, such as those located in higher areas of deprivation. This should include support to operators of who to engage in the MSK Hubs programme, as part of the Operational Blueprint.

A number of these recommendations align with those made by the Arthritis and Musculoskeletal Alliance (ARMA) through their 2024 report *Act Now: Musculoskeletal Health Inequalities and Deprivation*[26]*,* which outlines the next steps that need to be taken to tackle health inequalities across the UK. These include recommendations: *Investment for workforce upskilling*, *Integration into Health, Advancement in research approach* and *Focus on populations most in need of support*, which reflect ARMA's recommendations around: Identifying inclusion health groups, Community engagement, co-production and building trust, and using data to tackline inequalities and identify those most in need.

Conclusion

MSK conditions impact millions of people across the UK, have a negative impact on the health service and economy. These conditions also disproportionally impact older adults, those from ethnic minority backgrounds and low-income households. With a growing demand for treatment there is a need for a preventative or management approach that can reduce this impact and relieve pressure on the health service. Regular physical activity can achieve that. Specifically, leisure centres are well suited to providing MSK solutions or interventions in non-medical settings. Despite the range of offerings available, leisure facilities were not utilised to the best of their ability to support those with MSK conditions. This Healthy Ageing Challenge – Designed for Ageing, from UK Research and Innovation project called "Transforming gyms into community MSK Hubs: Mobilising the UK leisure sector to deliver inclusive, accessible, personalised and gamified health services for older adults with MSK

[26] Arthritis and Musculoskeletal Alliance (ARMA; 2024). Act Now: Musculoskeletal Health Inequalities and Deprivation. https://arma.uk.net/wp-content/uploads/2024/03/Musculoskeletal-Health-Inequalities-and-Deprivation-report_v07.pdf

conditions", or MSK Hubs for short, looked to utilise these settings with a programme delivered in partnership that provided an MSK solution in leisure centres.

Between April 2022 - March 2024 a project partnership of ukactive, Good Boost, ESCAPE-pain and Arthritis Action delivered an industrial research project that aimed to complete the product co-production, development, testing and research evaluation to achieve public roll-out and commercialisation of MSK Hubs. The component parts of MSK Hubs delivered by each project partner ensured there was structure yet individual choice at both a leisure centre local level and from people with MSK conditions. The implementation of The Active Standard meant there were high compliance and standards by those delivering MSK Hubs.

Initial data analysed in this report does indicate that it was feasible to implement MSK Hubs within leisure centres, that there was a high level of participation, activity attendance and adherence, and that multiple referral routes were and can be used successfully to access the hubs.

MSK Hubs initially engaged 100 facilities to deliver MSK Hubs, with 94 going on to deliver the project from 15 leisure operators across the UK. At least 11,785 session attendances took part from at least 1,631 people with MSK conditions. Data presented shows that although a range of people were engaged and despite targeting areas of the country with the highest deprivation, there was high representation from older, female, white, and more affluent people. This indicates three things.

Firstly, that the MSK Hubs is a product that can be feasibly scaled by operators who have multi-sites, even beyond target areas, and does attract engagement from the local community in need of MSK rehabilitation support – which were two objectives of this UKRI industrial research project. Secondly, it helps us understand that more needs to be done to target those who suffer from the greatest health inequalities, pertaining to the recommendation from ARMA's report, and the existing data collected through the tablets can support this to happen. Thirdly, that individuals with multiple LTHCs are interested in, and find use in, attending the MSK Hubs programmes. Participants presented mainly with MSK conditions, but they also had other conditions which indicates that this model could be scaled to help more people suffering with multi-morbidities within leisure centres.

Participants heard about MSK Hubs through a variety of communication routes. At the local leisure centre was the most frequent route, which indicates that there is demand from individuals to self-refer and to receive support for their condition in a non-clinical setting. This was followed by a GP or physio as the next most frequently reported route to entry, highlighting that having referral pathways in place also ensures individuals can access localised care for their conditions. The existence of a greater number health links on a local level could have improved this route to entry and this is a key area to be integrated into future operational blueprints and support systems for operators if the MSK Hubs is scaled.

Those that took part, did so for an average of seven weeks and seven sessions. Outcomes data indicated that for wellbeing (ONS-4) there was significant improvement at 12-weeks, particularly for feelings of satisfaction. Given than average attendance was less than this, focus could be put on ensuring participants are engaged for a longer period to exude the full wellbeing benefits of the programme. Although follow up physical activity levels were not collected, baseline data suggests a high proportion of inactive and fairly active participants were engaged from the offset. Qualitative feedback supports this with reports from participants who felt more active, more mobile and more able to engage in daily activities as a result of their participation in MSK Hubs. For pain, there were MCID improvements in both average and maximum pain experienced by participants. Overall, the

outcomes data is beginning to indicate that improvements were seen by those taking part in MSK Hubs, and that ongoing participation in the hubs could extend or further these improvements.

The data presented that explores wider participation with leisure facilities indicates that MSK Hubs participants also take part in a range of other activities provided within the facility that delivers MSK Hubs, which was another objective of the industrial research project. Ongoing activity participation is important for sustaining individual physical activity participation and engagement with leisure operator services overtime. This data also indicated that higher MSK Hubs participation, coupled with significant improvements in wellbeing at 12-weeks and pain score improvements, suggests those who participate in MSK Hubs over a longer period get the greater benefits and are active more often within facilities outside of the structured sessions. The usage of facilities outside of the MSK Hubs also suggest that these facilities are welcoming places for those with MSK conditions, with MSK Hubs helping to remove perceived barriers to attending facilities and receiving localised MSK rehabilitation support. This demonstrates that the MSK hubs model offers a plausible solution to localised MSK rehabilitation, and in part fulfils a further recommendation from ARMA which indicates that MSK service delivery needs to be embedded into the community, utilising the expertise of those within the community services (e.g. leisure facility staff) to provide this delivery[26].

Providing MSK Hubs as an offering within facilities may lead to greater customer support, especially those suffering with an MSK condition, to be more physically active and then utilise the facility to a greater extent. From an operator perspective this could lead to increased revenue for membership sales, secondary spend, and recommendations to the participants peers. The predicted social value generated from MSK Hubs shows that although this was an industrial research project with an element of development, testing and refining, the project returned almost half of the funding as social value. Although this could be improved, ongoing delivery could increase this social value beyond the original investment.

As an industrial research project, it was also important to learn and develop as the delivery was undertaken. It was not all plain sailing, and many learnings are presented that address the operations, delivery and research undertaken. From these, and the data presented, eight recommendations have been produced to support the continued development and evolution of MSK Hubs to scale further across the UK, support those delivering it, and to achieve maximum impact for those participating. These recommendations are largely in line with and reflect recent recommendations released by ARMA through their 2024 report *Act Now: Musculoskeletal Health Inequalities and Deprivation*[26], which outlines the next steps that need to be taken to tackle health inequalities across the UK. Specifically, the recommendations pertaining to the personalisation of care, care integrated in and close to the community, the development of trusting, integrated relationships across different organisations operating in public health and the use of data to drive needs and rehabilitation for MSK. This is further indication that the model of the MSK Hubs, and its operation within leisure centre settings, is a vital and scalable solution to addressing health inequalities.

Whilst this was a pilot project, MSK Hubs has been influencing national policy. The UK Government's new Sport Strategy, 'Get Active' (Sporting Futures II) includes MSK Hubs as the first case study in the document[27]. The Chief Medical Officer's Annual Report 2023 'Health in an Ageing Society' references MSK Hubs as well as project partners Good Boost and ESCAPE-pain in relation to evidence-informed

[27] Department for Culture Media and Sport. 2023. https://assets.publishing.service.gov.uk/media/64ef008f13ae15000d6e302c/11187-DCMS-Sports_Strategy_Report_CM_ACCESSIBLE-02.pdf

health and wellbeing interventions becoming embedded in the local health and social care systems[28]. But most notably, was The Chancellor's commitment for the scaling up of MSK Hubs in the Spring Budget 2023[29].

As noted, there is potential for the MSK model to be expanded to manage a number of LTHCs, moving from solely an MSK community hub to a multi-morbidity community hub. It thus has potential to help reduce further health inequalities by providing localised access to support using the expertise and space of local leisure facilities to host locations for sustainable, long term activity behaviours.

This concept aligns with several recent announcements. Firstly, the Chancellor's announcement in the Spring Budget of a £400m investment to increase the availability of mental health and musculoskeletal resources and expand the placement and support scheme for individuals at a place-based level. Secondly, The 2022 Fuller stocktake report[30], which highlighted recommendations for ICSs to support integrated primary care with a focus on local population-based care. This MSK hubs model, and the potential expansion of it, can offer an integral solution to meeting local population health needs, by both streamlining access to care and advice for individuals in their community and providing personalised and proactive care with support from a wide team of professionals.

There were areas unforeseen before the project started, with large amounts of flexibility required from all project partners. The learnings and evolution have taken the MSK Hubs that was funded in 2022 through a feasibility and testing phase that has produced a product that bridges the gap between health care and leisure, demonstrating that leisure facilities are a suitable non-medical setting to support people with MSK conditions. The positive engagement from leisure facility operators, the participation and outcomes data from participants, the wider physical activity participation, the predicted social value generated, and policy impact that this MSK Hubs pilot has achieved indicates the potential for scalability and greater impact. Addressing challenges and learnings can further develop MSK Hubs to ensure greater impact and support for people suffering with MSK conditions.

[28] Chief Medical Officer's Annual Report 2023. https://assets.publishing.service.gov.uk/media/65562ff2d03a8d000d07faa6/chief-medical-officers-annual-report-2023-web-accessible.pdf

[29] ukactive. 2023. https://www.ukactive.com/news/spring-budget-ukactive-highlights-opportunities-for-physical-activity-sector-to-drive-growth/

[30] NHS England (2022). The Fuller stocktake report, 'Next Steps for Integrating Primary Care. https://www.england.nhs.uk/wp-content/uploads/2022/05/next-steps-for-integrating-primary-care-fuller-stocktake-report.pdf

Appendices

Appendix 1. Demographic breakdown of participants who took part in MSK Hubs for less than six-weeks and for between six and 12-weeks.

	Less than 6 weeks (n=925)		6-12 weeks (n=261)	
	n	%	n	%
Gender				
Male	141	15.2%	54	20.7%
Female	762	82.4%	204	78.2%
Other	16	1.7%	3	1.1%
Prefer not to say	6	0.6%	0	0.0%
Age				
Under 20	2	0.2%	2	0.8%
20-29	47	5.1%	7	2.7%
30-39	85	9.2%	14	5.4%
40-49	86	9.3%	14	5.4%
50-59	161	17.5%	58	22.5%
60-69	296	32.1%	66	25.6%
70-79	210	22.8%	84	32.6%
80-89	28	3.0%	10	3.9%
Over 90	7	0.8%	3	1.2%
Ethnicity				
Asian	40	4.4%	4	1.6%
Black	26	2.9%	9	3.6%
Mixed ethnicity	15	1.7%	1	0.4%
Other ethnic group	6	0.7%	1	0.4%
Prefer not to say	0	0.0%	0	0.0%
White	812	90.3%	238	94.1%
Employment status				
Employed full time	185	20.6%	29	12.0%
Employed part time	133	14.8%	34	14.1%
Prefer not to say	47	5.2%	9	3.7%
Retired	435	48.5%	139	57.7%
Student	8	0.9%	3	1.2%
Unable to work	88	9.8%	27	11.2%
How participants heard about MSK Hubs				
GP or Physio	155	17.9%	55	22.8%
Leisure Centre	399	46.0%	103	42.7%
Other	100	11.5%	14	5.8%
Poster or Leaflet	35	4.0%	7	2.9%
Social Prescriber	51	5.9%	18	7.5%
Word of mouth	128	14.7%	44	18.3%
Index of Multiple Deprivation			226	

1 – most deprived	51	6.4%	11	4.9%
2	54	6.7%	18	8.0%
3	62	7.7%	21	9.3%
4	69	8.6%	16	7.1%
5	86	10.7%	22	9.7%
6	85	10.6%	29	12.8%
7	92	11.5%	29	12.8%
8	101	12.6%	20	8.8%
9	96	12.0%	28	12.4%
10 – least deprived	107	13.3%	32	14.2%
Distance travelled				
0-1.0km	799	90.6%	223	91.4%
1.1-2.0km	69	7.8%	20	8.2%
2.1-3.0km	10	1.1%	0	0.0%
3.1-4.0km	3	0.3%	0	0.0%
4.1-5.0km	0	0.0%	0	0.0%
5.1-10.0km	0	0.0%	0	0.0%
10.1-20.0km	0	0.0%	1	0.4%
Over 20km	1	0.1%	0	0.0%
Initial registration				
Organisation				
Good Boost	898	97.1%	261	100.0%
ESCAPE-Pain	26	2.8%	0	0.0%
Arthritis Action	1	0.1%	0	0.0%
Product				
Hub	886	96.8%	260	99.6%
Move Together	2	0.2%	1	0.4%
ESCAPE-Pain	26	2.8%	0	0.0%
Arthritis Action	1	0.1%	0	0.0%
Programme				
Land	144	15.7%	33	12.6%
Aqua	709	77.5%	224	85.8%
Move Together	2	0.2%	1	0.4%
Bump Boost	31	3.4%	3	1.1%
ESCAPE-Pain	27	3.0%	0	0.0%
Arthritis Action	2	0.2%	0	0.0%

Appendix 2. Case Study: Parkwood Leisure facility engagement

Spotlight: Parkwood Leisure

Parkwood Leisure trialled the MSK Hubs product across 30 sites in the UK.

- Good Boost tablet sessions were delivered across 23 sites
- ESCAPE-pain programme across 15
- Arthritis Community Groups delivered by Arthritis Action across 18
- 4 sites were selected to pilot The Active Standard (TAS) accreditation

Parkwood Leisure saw successful uptake and use of the MSK Hubs across their sites, which was driven by a variety of elements. Firstly, the recruiting of site 'MSK Coordinators' responsible for liaising between customers and the MSK programme, allowed for targeted customer outreach. Sites also implemented a B2C marketing campaign, including social media and website, that targeted their customer base, implementing a B2B marketing to clinicians to support and build referral pathways, reducing the operational burden of automating referrals, implementing a localised and national public relations approach across their piloting sites, and holding sites to account through the implementation of internal KPIs. Some of their own surveying found:

- 65 average new users per site
- 1,885 referrals (92% self-referral, 8% referral from HCPs), with 1,170 of these attending a class
- 64% of attendees reporting that their MSK condition and wellbeing had improved to 'no longer a problem' as a result of participating in an MSK Hub

Spotlight: Tarka Leisure

Tarka Leisure is a leisure centre in Barnstable, opened in June 2022. The operator Lex Leisure, a subsidiary of Parkwood Leisure, won the bid to operate the facility; as part of the bidding process, community outreach and support for individuals living with long-term health conditions were vital. The previous operators had not been running GP referral programmes, so Parkwood needed a simple solution to deliver a programme for individuals suffering from long-term health conditions such as MSK conditions.

Parkwood provided its sites with comprehensive support to implement the MSK Hubs programme. This included risk assessments, FAQs, an informative website with self-referral forms, GP forms and online bookings. Tarka Leisure centre felt that the support given to them meant it was easy for them to implement the programme from an operational perspective. After the facilitators were trained on the relevant aspects of the MSK Hubs their staff were trained in the registration and programmes to better understand the customer journey.

Tarka Leisure began with generic social media posts to their consumers, then switched to localised posts to gain more traction with members of the local community. Posts included pictures showing a range of participants in their pool or studio doing the programmes. To engage clinicians, they hosted webinars and provided resources for staff on how to engage healthcare professionals (HCPs) and provided screen marketing in local GP surgeries.

The health and fitness manager at Tarka Leisure contacted every individual who enquired about the MSK Hubs, signposting them to coffee morning chats first, offering individuals a friendly, safe space in which to familiarise themselves with the leisure centre environment before beginning any exercise.

At the Arthritis Community Groups, individuals register themselves on the tablets and with facilitators on hand to signpost them to the next step. These are attended by both newly registered and existing customers who have begun their MSK Hub journey. Good Boost Aqua sessions became the most well attended and popular sessions for this centre, resulting in an increased number being delivered – up to 3 a week.

A total of 70 sessions have been delivered by the site, to support 76 referrals to the hubs. Of these referrals, 86% were self-referrals (66), and 14% (10) were referrals from clinicians. The centre has seen 100% occupancy at these sessions and have received requests from customers for increased access. As a result, tablets are being offered for use during casual swim timeslots and within the gym. To complement the MSK Hubs programme, and support individuals' physical activity journey outside of this programme, Tarka Leisure is rolling out Move Together the surrounding rural areas within its contract.

Appendix 3. Case Study: Everyone Active site implementation

Spotlight: Scarborough Sports Village

Scarborough Sports Village is a site operated by Everyone Active that has implemented all components of the MSK Hubs programme and provides a strong case study for how they all work together as one product. This included the delivery of ESCAPE-pain and Good Boost sessions alongside adapting the Arthritis Action training to create its own 'Community Chat Groups'.

Firstly, Scarborough Sports Village used a triage approach to recruit individuals onto the MSK Hubs programme. It maximised its existing GP referrals route, using their Exercise Referral instructor to help sign post potential participants towards the MSK Hubs if the individual's referral highlighted elements of MSK need. In the first instance, this involved sign-posting them to the ESCAPE-pain programme, and was followed by encouragement for the individual to then self-refer to Good Boost, especially if ESCAPE-pain was not appropriate for their need.

Participants in the ESCAPE-pain programme particularly benefited from the progressive nature of the 12-week programme, alongside the motivational interviewing and educational components. The educational component of the programme was an important factor in encouraging individuals to continue taking part in the first part of the programme. The ESCAPE-pain programme was set up in a way that gave individuals a platform to talk about their experiences in a safe environment with peer support and helped them to feel listened to and understood in a way that is not often possible during GP appointments due to limited time. The face-to-face element of the ESCAPE-pain programme also proved essential to keep participants involved in the programme as well as taking part in other activities within the leisure centre afterwards.

The participants that completed all of the ESCAPE-pain programme reported improvements in mobility and confidence to engage in more regular physical activity. These individuals were also more likely to continue with other group activities, having had the opportunity to familiarise themselves and feel comfortable within the leisure centre. For those who were unable to commit to the full 12-weeks of the course, an entry barrier for some, Scarborough Sport Village offered a referral onto Good Boost. Good Boost provided the flexibility of being able to take part in exercise tailored to their MSK need yet in a less structured format, while still offering progression and socialisation within a group environment.

Social media assets and posters were used to engage members and individuals in the community to self-refer to the MSK Hubs programme. Individuals who came into the centre for other reasons such as donating blood, were also made aware of the MSK Hubs through the centre staff. Here, self-referral began with Good Boost, which comprised of an initial 30-minute induction to allow individuals to familiarise themselves with the tablet, the instructors in the centre and the other facilities that the leisure centre had to offer. Good Boost sessions were scheduled to always be delivered with a free hour afterwards, to allow individuals to then take part in the Arthritis Action Community Groups.

Scarborough agreed a price point for the MSK Hubs which was suitable for their members needs. They charged £48 for 12-weeks use (£4 per session for ESCAPE-pain, and £4.50 per session for Good Boost). Included in this price was additional guidance and information on how to use the leisure centre equipment and facilities, and free trials of existing group exercise classes during the 12-weeks (e.g. senior fitness classes, chair-based classes) to allow individuals to familiarise themselves with the rest of the centre. By familiarising individuals with the other activity options available within the facility so early on the process provided participants with a clear exit point to continue using the leisure centre and its facilities once they had finished the MSK Hubs programme. Scarborough Sports Village have

noted that an estimated 50% of individuals have joined as members following the completion of the MSK Hubs programme showing value from an operator perspective in gaining more members.