

Impact Case Study Template

Title of case study	Influencing National Guidelines – Expert Working Group for the UK Chief Medical Officers Physical Activity Guidelines for Adults, and Expert Panel for Communication
Author(s)	Dr James Steele, Dr James Fisher
1. Summary of the impact (around 100 words) State the specific impacts, benefits or contributions claimed in this case study.	
<p>Solent University researchers have undertaken a body of research in exercise science, including in non-athletic populations such as the elderly, children, and those suffering from chronic conditions such as lower-back pain. Through involvement in expert groups, Solent research has had the following public health impacts:</p> <ul style="list-style-type: none">• A renewed emphasis on muscle strengthening in the UK Chief Medical Officers' revised guidelines on physical activity.• Impact on public understanding of the importance of muscle strengthening alongside moderate-vigorous aerobic exercise, as seen in media coverage and social media discussions.• Impact on over 17,000 health professionals by informing the design of Public Health England's Moving Healthcare Professionals Programme.	
2. Underpinning Research (around 500 words) Explain the research that underpinned the impact, when it was undertaken (must be between 1 January 2000 and 31 December 2020) and by whom (names the key researchers and positions they held at the institution at the time of the research).	
<p>Solent University has carried out a body of research regarding the benefits of exercise for a range of health outcomes, with a focus on resistance training, and the generation of a body of evidence supporting the application of effective yet simple and scalable approaches. This started in 2011 with the publication of "Evidence Based Resistance Training Recommendations" by James Fisher, James Steele, Stewart Bruce-Low (Solent University at the time) and Dave Smith (Manchester Metropolitan University). This paper was a highly cited review considering the manipulation of resistance training variables for strength adaptations that spurred a follow up review in 2013 from James Fisher, James Steele, and Dave Smith titled "Evidence Based Resistance Training Recommendations for Muscular Hypertrophy" considering gains in muscle mass.</p> <p>These reviews paved the way for subsequent empirical studies with colleagues and collaborators both nationally and internationally which have further examined the application of simple resistance training approaches. This has included a series of randomised controlled trials along with Dr Luke Carlson from an organisation in the Minneapolis, MN, USA called Discover Strength. Further research has been conducted with a collaborator in Germany, Prof. Dr Jurgen Giessing (University of Koblenz-Landau) as well as collaborators in Brazil led primarily by Dr Paulo Gentil (Federal University of Goias). A number of published studies have also resulted from co-production of research from students at Solent University being supervised by Dr Steele and Dr Fisher. In addition, Dr Steele was invited as a guest editor (with Dr Gentil) for a special issue of the journal BioMed Research International titled "Exercise for Health and Disease: Time to Move Ahead".</p> <p>Dr Steele was subsequently appointed as Principal Investigator for ukactive's Research Institute, partly resulting from ongoing work with the institute including the collaboration on two randomised trials examining community-based resistance training interventions.</p> <p>More recently, and pertinent to the current CMO guidelines, Dr Steele led a thought leadership</p>	

piece along with a consortium of collaborators worldwide questioning current national and international physical activity guidelines regarding what is termed the 'muscle strengthening activities' (which includes resistance training) component. The paper published in BMC Public Health titled "A higher effort-based paradigm in physical activity and exercise for public health: making the case for a greater emphasis on resistance training" highlighted the current lack of emphasis regarding such physical activity and exercise in current public health programmes, as well as the specific nature of the current muscle strengthening activity recommendations and highlighting from both our own research and others that a very simple set of resistance training recommendations seem feasible and effective.

3. References to the research

Cite up to six references to key outputs from the research, evidence about the quality of the research and details of any grants that supported the research.

- 3.1 Fisher, J., J. Steele, S. Bruce-Low, and D. Smith, 2011. Evidence Based Resistance Training Recommendations. *Medicina Sportiva*. 15(3), 147 – 162
- 3.2 Fisher, J., J. Steele, and D. Smith, 2013. Evidence Based Resistance Training Recommendations for Muscular Hypertrophy. *Medicina Sportiva*. 17(4), pp 217 – 235
- 3.3 Fisher, J., L. Carlson, J. Steele, and D. Smith, 2014. Effects of pre-exhaustion, exercise order and rest-intervals in a full body resistance training intervention in trained participants. *Applied Physiology, Nutrition and Metabolism*. 39(11), pp 1265-1270
- 3.4 Steele, J., J Fisher, M. Skivington, C. Dunn, J. Arnold, G. Tew, A. M. Batterham, D. Nunan, J. M O'Driscoll, S. Mann, C Beedie, S. Jobson, D. Smith, A. Vigotsky, S. Phillips, P. Estabrooks, and R. Winett, 2017. A higher effort-based paradigm in physical activity and exercise for public health: making the case for a greater emphasis on resistance training. *BMC Public Health*. 17, 300
- 3.5 Mann, S., A. Jimenez, J. Steele, S. Domone, M. Wade, and C. Beedie, 2018. Programming and supervision of resistance training leads to positive effects on strength and body composition: Results from two randomised trials of community fitness programmes. *BMC Public Health*. 18(1), 949
- 3.6 Moore, J., Z. Merchant, K. Rowlinson, K. McEwan, M. Evison, G. Faulkner, J. Sultan, J. S. McPhee, and J. Steele, 2020. Implementing a system-wise cancer prehabilitation programme: Greater Manchester's 'Prehab4Cancer'. *European Journal of Surgical Oncology*. Epub ahead of print; doi: 10.1016/j.ejso.2020.04.042.

4. Details of the Impact (around 750 words)

This section should explain the nature and extent of the impact, the nature of the beneficiaries and how the research led or contributed to this. Include dates.

Impact on UK public health policy

In 2011, the UK's Chief Medical Officers (CMOs) published a set of physical activity guidelines offering evidence-based recommendations for physical activity in different segments of society. The guidance for adults recommended 150 minutes of moderate-vigorous aerobic physical activity a week. Solent University's underpinning research highlighted the importance of strength training, as well as physical activity, and demonstrated that muscle strengthening was underemphasised in the CMO's 2011 guidelines.

Based on these findings, and Solent's efforts to highlight the issue, Dr James Steele was invited in 2018 to join the Chief Medical Officers' Expert Working Group (EWG) to review the 2011 CMO Physical Activity Guidelines for Adults. The EWG conducted its review during 2019 and the new guidelines were announced in September 2019. Muscle strengthening and high intensity exercises now have a prominent place in the guidelines, directly reflecting the Solent findings.

The guidelines are a major measure in the government's public health programme and put the UK in a world-leading position:

“In 2010, we were among the first Nations in the world to set out the evidence for how much and what kinds of physical activity we need to do to keep ourselves healthy. Since then, the evidence has become more compelling and the message is clear: ‘If physical activity were a drug, we would refer to it as a miracle cure, due to the great many illnesses it can prevent and help treat.’” Foreword, UK Chief Medical Officers' Physical Activity Guidelines (2019) [5.1].

Through his role on the EWG Dr Steele put forward evidence from Solent research to successfully make the case for a renewed and increased focus on muscle strength training. This became the most noticeable change to the guidelines with the CMOs themselves acknowledging that:

“The recommendations we made in 2011 on muscle strength have not achieved the recognition we believe they merit. We therefore want to underline the importance of regular strength and balance activities: being strong makes all movement easier and increases our ability to perform normal daily tasks” [5.1]

And Dr Charlie Foster, Chair of the UK Chief Medical Officer's Expert Committee for Physical Activity, noted:

“Dr Steele played a fundamental role in the Expert Working Group for Adults, reviewing the evidence regarding the role of muscle strengthening activities such as resistance exercise. The highest levels of evidence were used to inform the revised Chief Medical Officers Physical Activity Guidelines for the UK. This included research conducted by at Solent University by Dr Steele and colleagues. The new guidelines place a strong emphasis on the importance of activities such as resistance exercise. I personally spoke with Dr Steele on a number of occasions to use his expert knowledge on the technical details of the new strength training recommendations (i.e. frequency, specificity and intensity.)” [5.2].

Impact on public attitudes to physical exercise

Dr Steele's work regarding resistance exercise has been picked up by the media previously, including the New York Times and Elemental. The media also homed-in on the new guidelines focusing on muscle strengthening as the “forgotten guideline” with The Guardian, BBC, The Mirror, the BMJ Blog and others all highlighting the importance of muscle strength. For example, The Independent reported that “muscle strengthening exercises could help delay the natural decline in muscle mass and bone density that starts from around age 50 [. . .] believed to be a central reason for why older people lose their ability to carry out daily tasks.” [5.3]

In order for a public health recommendation to succeed, it needs to be visible to the public. The new emphasis on muscle strength not only reflects the scientific evidence, it proved to be a distinctive and appealing hook for the media. However, to further build upon and support translation of the guidelines into effective communication, a new Expert Working Group for Communications was formed which Dr Steele was also invited to be part of. Dr Foster noted of the groups and Dr Steele's participation:

“...he has also been appointed support the development of effective communications strategies around the new Guidelines to help raise awareness and participation, particularly with key stakeholder groups (i.e. fitness professionals and health professionals). He is a key member of the new CMO Expert Working Group for Communications and he is helping to inform this strategy.”

With this Dr Steele has led further work involving the Expert Working Group and also his students, to understand what other countries may be doing effectively already for communications to inform the UK's strategy.

Already, only one month after their release, the guidelines were having a direct impact on public understanding of and attitudes towards physical activity and are catalysing a wider conversation, for example around nutrition and the nature of our physical spaces and workplaces:

- “So many women ask me at post natal checks “when can I exercise?” I'm pro activity 👍 it's nice to have clear advice to signpost them to” @xcurlytwigx, Twitter [5.4]

- “Work places totally need to get on board.... supporting people to be active through the day.” @catfordmum, Twitter [5.4]
- “Can you create pavements on all roads please? At least one side. In Lake district just now and no pedestrian access on roads for miles and miles. I live in Bolton - much the same in rural areas.” @janewilcock, Twitter [5.4]
- “The graphics are excellent and should be posted up on the back of every loo door in the country.” @clearmapping, Twitter [5.4]

Impact on healthcare and fitness practice and policy

Despite the public impact described above, the guidelines are primarily aimed at health professionals, policymakers and others working to promote physical activity, sport and exercise for health benefits.

Public Health England (PHE) is already working to empower this group through its Moving Healthcare Professionals Programme (MHPP), launched in 2018. Dr Steele also sat on the Steering Committee for this initiative, bringing Solent’s underpinning research to bear on the design and implementation of the programme. MHPP aims to change policy regarding the education of healthcare professionals around physical activity and its benefits, including how best to prescribe it. To date the MHPP model has been applied in two key areas, physical activity and health and work. An initial evaluation of MHPP in 2019 showed:

“The physical activity programme in a partnership between Public Health England and Sport England has delivered face-to-face training to 17,105 healthcare professionals, embedded materials in almost three quarters of English medical schools and overseen > 95,000 e-learning modules completed over two and half years. Evaluation of the individual elements of the model is ongoing and aims to show improvements in knowledge, skills and practice. Further evaluation is planned to assess patient impact.” [5.5]

The full impact of the new CMO Guidelines on Physical Activity on professional and policy audiences is yet to be seen but, one month in, the response from the professional and policy community has been positive with health professionals and educators commenting “Now our role as a public or educator is to encourage all to be active” and “very useful info graphics - Exercise recommendations for Adults” [5.4]. Huw Edwards, chief executive of not-for-profit health body ukactive, said:

“In previous iterations of the chief medical officers’ guidelines, the focus has been on the importance of moderate to vigorous aerobic physical activity, with the importance of muscle strength and activities to promote it playing second fiddle. The latest guidelines are more reflective of the evidence and the importance of activities such as resistance training for all adults, reflecting their equal positioning alongside the aerobic activity recommendations. ukactive is proud to support these guidelines and for our research institute to feed into them.” [5.3]

The health sector specialist media has also picked up on the key messages of the guidelines. Health Club Management reported “The UK fitness industry should make a concerted effort to highlight the importance of strength training, following the publication of the Chief Medical Officer’s (CMO) guidelines for physical activity” [5.6]

The success of the MHPP so far shows the real potential for the new guidelines to engage and empower professionals and policymakers.

Additionally, to this, the Chartered Society of Physiotherapy (CSP) began to develop its own ‘Strength Messaging Project’ aimed at understanding and developing communications and supporting both patients and physiotherapists to engage in muscle strengthening activities. Further, Versus Arthritis has been working to develop its physical activity offer for patients and practitioners. Dr Steele has sat on the Expert Advisory Boards for both of these projects helping to shape the direction that these key stakeholders will take. Project Manager for the CSPs Strength Messaging Project, Sarah Curgenvin said:

“Dr Steele played an important role in providing advice and expertise to support the development

of our Strength Messaging Project to promote awareness, knowledge, and participation in muscle strengthening activities for those adults' long terms conditions and physiotherapists who support them. Our work has benefited from the knowledge produced by Dr Steele's work regarding the importance of muscle strengthening activities such as resistance exercise, and his role in the Chief Medical Officers Physical Activity Guidelines for the UK Expert Working Group for Adults reviewing the evidence base on this topic."

Rhian Horlock, Strategic Programme Manager for Physical Activity at Versus Arthritis said of Dr Steele:

"We really value your input to check and challenge our approach for our future physical activity offer."

Lastly, the underpinning research conducted by Dr Steele, Dr Fisher, and their various colleagues and collaborators, has had direct impact on informing the delivery of a system-wide cancer prehabilitation programme in Greater Manchester – Prehab4Cancer. The specific exercise prescription utilised in Prehab4Cancer was based heavily upon work from Solent University examining minimal dose approaches to exercise.

5. Sources to corroborate the impact (indicative maximum of ten references)

Cite up to 10 pieces of evidence to verify the above impact claims. These could be reports, reviews, web-links, media, statements from users/beneficiaries, or details of users/beneficiaries who can provide such a statement.

5.1 The new guidelines: <https://www.gov.uk/government/publications/physical-activity-guidelines-uk-chief-medical-officers-report>

5.2 Statement from CMOs or chair of EWG.

5.3 The Independent: <https://www.independent.co.uk/life-style/health-and-families/weight-lifting-dancing-health-fitness-muscle-mass-bone-density-guidelines-a9095496.html>

5.4 Responses to Dame Sally Davies' announcement of the guidelines on Twitter: <https://twitter.com/clearmapping/status/1170273282567921666>

5.5 Brannan, M., Bernardotto, M., Clarke, N. *et al.* Moving healthcare professionals – a whole system approach to embed physical activity in clinical practice. *BMC Med Educ* **19**, 84 (2019) doi:10.1186/s12909-019-1517-y

<https://bmcmmededuc.biomedcentral.com/articles/10.1186/s12909-019-1517-y>

5.6 <https://www.healthclubmanagement.co.uk/health-club-management-news/CMO-guidelines:-fitness-sector-must-highlight-importance-of-strength-training/343059>

6. Plans for developing the case study

Provide details of any plans to develop the case study. This could include underpinning research, activities to generate more impact, evaluation or evidence gathering. Also consider any challenges or risks to the development of the case study.

Continued research is being undertaken regarding simple applications of resistance training for public health including seeking funding for the Resistance Exercise And Community Health (REACH) project. Evidence will be gathered on an ongoing basis as a result of liaison with key stakeholders such as PHE, particularly through ukactive, in order to find out where and when the new guidelines are having impact. Further, with respect to the wider impact of communication of the new guidelines, work already conducted towards the new Expert Working Group for Communication has heavily emphasised the importance for evaluation of impact (see <https://osf.io/preprints/sportrxiv/bhrky>) to understand whether such strategies and campaigns are effective. Dr Steele will be involved in advising that such evaluations are designed and implemented as part of the communications strategy for the UK CMO Physical Activity Guidelines.