

Institution: Ulster University
Unit of Assessment: 24 Sport and Exercise Sciences, Leisure and Tourism
<p>1. Unit Context and Structure, Research and Impact Strategy</p> <p><u>Unit Context and Structure</u></p> <p>Ulster University's Sport and Exercise Sciences Research Institute (SESRI) was established in 2002 with a strategic vision to produce world-leading research in sport and exercise science that materially impacts on issues of health, performance and policy for a range of stakeholders in the sport and exercise field. SESRI has submitted to four previous research assessment exercises demonstrating a clear track record for high-quality, sustainable, progressive and world-leading research (2014: overall 14% 4-star vs. 2008: 5% 4-star), achieved via a plethora of national and international collaborations with recognised research centres of excellence, sustained growth in grant income, recruitment and development of new staff and early career researchers, and through the publication of high-quality impactful research. The momentum built across these exercises has continued in this REF cycle, and SESRI is now recognised internationally for its innovative, cutting-edge multi- and inter-disciplinary research. Over this assessment period, we have expanded and enhanced our profile by developing research specialisms and projects within two vibrant research centres:</p> <p><u>The Centre for Exercise Medicine, Physical Activity and Health</u> led by Professor Gareth Davison comprises 16 staff members conducting research in: Exercise Biochemistry and Physiology (Davison, McClean, McMahon); Physical Activity and Health (Murphy, Carlin, Fitzpatrick); Sport and Exercise Psychology (Paradis, Meade, Sharp, Breslin, Haughey); Sport and Exercise Nutrition (McNeilly); Sport and Exercise Biomechanics (McCabe, Wallace); Sport and Exercise Medicine (Matthews, Kennedy).</p> <p>Research in this Centre is inter- and multi-disciplinary and focuses on physical activity and disease prevention, sports medicine, metabolism and nutrition, and exercise and genetics with two broad aims:</p> <ol style="list-style-type: none"> 1. to investigate the role of physical activity, exercise and nutrition in the prevention and treatment of chronic disease, and in the promotion of psychological well-being; 2. to explore the biomechanical and medical factors that contribute to sports performance and the management, prognosis and rehabilitation of sports injuries. <p><u>The Centre for Sport in Society</u> led by Dr Paul Darby comprises 6 staff members conducting research in: Sports Sociology (Darby, Liston); Sports Politics and Management (Hassan); Social Psychology (Sharp, Paradis); Sports Management and Business (Kitchin).</p> <p>Research in this Centre is concerned with the cultural, political, social, economic, psychological and historical impact of sport with the following aims:</p> <ol style="list-style-type: none"> 1. to critically examine the role of sport in a variety of local, national and international contexts; 2. to undertake research which can be used to enhance the experiences and practices of/in sport for multiple stakeholders. <p>Each centre operates in an open and participatory manner, with cross-over of members between centres to facilitate collaborative, inter- and multi-disciplinary approaches to research projects. Researchers are supported by three administrative staff, three technical staff, and seven Visiting Professors across the subject disciplines. The work of both centres is augmented by a high-quality postgraduate research culture and environment (see section 2. People).</p> <p>In REF2014, SESRI received a 75% internationally excellent (3*) rating for its research environment. In this cycle, there have been considerable developments including an extension</p>

and enhancement of our **world-class research facilities**, the establishment of the Institute for Mental Health Sciences, and 2 new Human Performance Laboratories (Magee and Coleraine campus). This circa £1M investment has allowed for an extension of the applied and mechanistic work in psychology and human physiology-based research and has led to the recruitment of new academic staff, the publication of **world-leading outputs** and associated **impact**, and the support of high-quality PhD researchers to completion.

SESRI's focus on strategic research that is both translational and impactful has undergone a step change in this current cycle with an increasing emphasis on working with and producing research that impacts multiple stakeholders in sport and exercise. To this end, SESRI has conducted impactful research leading to **policy change**, nationally and internationally, in the domains of Sport and Mental Health, and Physical Activity for Health and Disease Prevention. These impact case studies were strategically identified at an early stage in this REF cycle, and their development was financially and continuously supported by SESRI. Beyond our two impact case studies, SESRI members prioritise impact in their research activities through close collaborations with multiple stakeholders and organisations in the sports industry (nationally and internationally), public engagement activities, and wide dissemination of our research findings (see section 4. Contribution to Society and Industry). SESRI has a policy of ringfencing financial support for impact generation through training (e.g., Fast Track Impact) and impact related activities (e.g., media and production workshops). We have a clear and **sustainable** plan moving into the next REF period that will maintain impact at the core of SESRI's research activities, as evidenced in part, by our ongoing work in collaboration with international organisations, such as UNICEF and FIFA, influencing policy developments on children's rights in the global football industry.

Research and Impact Strategy

In the 2014-2020 period, the SESRI strategy provided excellent research opportunities for staff and postgraduate researchers to achieve the following aims:

- to advance knowledge in our research areas through high-quality and impactful research outputs, emanating from inter- and multi-disciplinary and collaborative research;
- to facilitate the translation of the knowledge derived from our sport and exercise research into intellectual assets that impact positively on the economy, society and culture;
- to contribute to a strong and vibrant research and learning culture among our postgraduate and early career researchers to prepare the next generation of leading researchers in sport and exercise.

In support of our key aims, we developed the following strategic objectives: (1) to develop further a culture where research, discovery, creativity and innovation are encouraged and appropriately supported; (2) to produce outputs from our chosen areas of research which are deemed high-quality when assessed against international standards of excellence; (3) to provide a vibrant environment within which high-quality impactful research is promoted and sustained; (4) to facilitate the translation of knowledge into intellectual assets that impact positively on the economy, society and culture; (5) to disseminate the outputs and impacts arising from our research and innovation and communicate these to the widest possible audience; (6) to attract, train, develop and progress high-quality postgraduate researchers and early career research staff; and (7) to further integrate research within curriculum design and delivery to enhance the learning experience of our undergraduate and taught postgraduate students.

During this period, we have actively and successfully pursued each of these objectives through our two Research Centres and, in a wider context within the School of Sport, resulting in significant improvements in several key indicators including:

- 45% increase in the number of Category A submitted staff (from 13.2 [2014] to 19.2 [2020]).

- 162% increase in the number of PhD completions (from 10.3 to 27.01).
- Increase in number and quality of research outputs with more than 50 outputs per year during this assessment period, including: 250+ peer-reviewed journal articles, 6 books, and 38 book chapters. This represents an increase of 14% from 2014. 36.6% of our publications were in the top 10% of journals, with 17.4% of outputs in the top 10% of most cited publications worldwide.
- Further development of research collaborations with leading international researchers and centres of excellence (n>20; with new collaborations with research centres in, for example, Norway, Australia, U.S.A, Finland, Spain). 52.2% of our outputs published with international collaborators.
- Securing of external funding (>£2.2M) from a wide range of prestigious sources including: Research Councils, European Agencies, Charities and a range of local, national, and international partnership funding opportunities.
- Expanding level of impactful research in areas such as Sport and Mental Health, Physical Activity and Health, and in Football Migration and Children's Rights, benefitting local, national, and international agencies and stakeholders such as UNICEF UK and FIFA.
- Recognition of the achievement of existing staff via internal promotions (n=6) and distinguished research fellowships.
- Acting upon REF2014 feedback, SESRI was restructured to consolidate our research offering through two focussed and streamlined research centres; supported by a significant investment in additional staff (n=9).
- Extending our influence on international research platforms through editorial roles on international journals, membership of scientific boards for public organisations, appointments at overseas universities, invitations to international conferences, and hosting of international conferences such as the European College of Sports Science Annual Conference, and the European Sports Management Conference.
- Established and revalidated a suite of MSc programmes (Exercise Medicine, Sport and Exercise Nutrition, Sport and Exercise Psychology, Strength and Conditioning, Sports Coaching and Performance) within which research is a major focus. All programmes provide an excellent training base for further postgraduate research.

All School of Sport staff are committed to research-informed teaching, and this underpins all taught degree programmes offered by the School. Staff exhibit this commitment by ensuring that all learning and teaching is research-led and oriented. This approach has helped School staff to (1) increase NSS student satisfaction rates, (2) enhance research culture, (3) improve research and science communication skills, and (4) develop an intellectual curiosity across the disciplines.

Sustainability and Future Aspirations

The main objectives and activities for our research for the five years following submission are underpinned by the University's current Research and Impact Strategy (see REF5a), which has the following strategic intent at its core - '*Undertake interdisciplinary research in a supportive environment to produce internationally excellent and world-leading research with transformative impact*'. In keeping with this, the primary and collective focus of SESRI will be to address, in novel ways, significant, ongoing and emerging research questions in exercise medicine, physical activity and health, and in the social sciences of sport. The former encompasses questions relating to mental health and wellbeing, genetics and epigenetics, physical activity for disease prevention and management, sports medicine and rehabilitation, sports microbiology, and oxidative eustress. To realise our ambitious plans in this domain, we will work closely with the University's newly established School of Medicine which received

approval in September 2020 from the General Medical Council to recruit students to a graduate entry medicine programme, as well as considerable potential infrastructure investment of circa £28.55M to build a new Medical School based in Magee. We will continue to build collaborations with the University's Clinical Translational Research and Innovative Centre (C-TRIC) based at Altnagelvin Hospital. C-TRIC is an enterprise designed to facilitate healthcare research by bringing together clinicians, University staff and industry to achieve better outcomes for patients, locally and internationally. These inter-disciplinary relationships will expand our research capabilities and allow SESRI members to bring their innovative research ideas to fruition in cancer, cardiovascular disease, diabetes, orthopaedics, mental health, and personalised medicine. Further relationships will be developed and maintained to contribute to (1) the NI GP and exercise referral scheme, and (2) mental health and well-being hubs in NI community networks. The Centre for Sport in Society will address issues around equality and inclusion in sport (gender and disability), sport and identity politics, the sport-health nexus, children's rights in sport, transnational sports migration, and the business, politics and governance of sport.

Our strategic AIMS for 2021-2027 are as follows:

- To continue to promote and build a culture where research, discovery, creativity, and impact are encouraged and supported.
- To further enhance the significance and quality of our outputs within our chosen areas of research.
- To further augment the translational impact of our work.
- To consolidate and build upon our environment within which high-quality multi- and inter-disciplinary research is fostered and sustained.
- To secure substantial research funding.
- To continue to develop collaborations with regional, national, and international researchers.

To achieve these AIMS, SESRI will:

- Provide staff and postgraduate researchers with high-quality research training and professional researcher development through financial and other supportive initiatives. We will continue to nurture staff and PhD researchers, and expand our core research aspirations in Exercise Medicine, Physical Activity and in the Social Sciences of Sport.
- Provide direction, and support for attracting competitive external grant income. We will create opportunities for increasing our grant applications and success rate.
- Recruit high-quality postgraduate researchers capable of becoming internationally renowned in their field.
- Support and develop the creation of impactful research.
- Develop international connections, and work with international partners and collaborators to address global and relevant societal issues. We will work to further extend our international collaborations and networks.
- Retain and recruit high-quality research staff to build capacity across research centres - investment has been allocated for four new appointments in Physical Activity, Exercise Medicine, and in the Sociology of Sport in late 2020.

Unit-level environment template (REF5b)

Our strategic aims for 2021-2027 will be met through several mechanisms at Institutional, Faculty and research institute level, designed to assist in the delivery and realisation of our aims, and for monitoring the attainment of achievements. Membership of the SESRI is based on published criteria (1 published paper, current or past supervision of PhD researchers and potential to attract funding) reflecting excellence (or strong potential) in research performance. The SESRI Directorate (Director of SESRI/Research Centre Lead - Professor Davison, Research Centre lead Dr Darby, Head of School – Dr Fitzpatrick, and Postgraduate Tutor, Dr McCabe) guides the implementation of the strategy. SESRI's terms of reference are to develop, implement and regularly review a research strategy which is in line with the current Institutional Research and Impact Strategy: (1) to create an environment that promotes research excellence as evidenced by performance in research assessments, (2) to provide a focus for multi- and inter-disciplinary research and innovation within, and beyond the Faculty, (3) to facilitate the dissemination of high-quality impactful research and publications, (4) to secure external research funding, (5) to encourage innovation and the exploitation of intellectual property created by our research, and (6) to promote the dissemination of successful research initiatives beyond the academic community. Each of the 2 Research Centers (RCs) contribute to the development and articulation of the SESRI research policy and strategy that is reflective and supportive of work conducted within the RC. Each RC reports on research performance, particularly in relation to the quality and volume of research outputs and external research funding, and each RC encourages synergies to strategically plan for the collaborative conduct of research projects and the delivery of collaborative outputs, and to identify and prioritise pathways to impact. The RC's support a culture of research integrity and ensures that research is conducted according to appropriate ethical, legal and professional frameworks, obligations and standards (see section 2 People).

Within this REF cycle, Ulster University refreshed its Research and Impact strategy to introduce and position an Associate Dean for Research and Impact within each Faculty. The Associate Dean provides Faculty-level leadership for the development of research and impact, while promoting opportunities for greater multi- and inter-disciplinary research collaborations and sharing of best-practice within and between Faculties. This structure provides the SESRI Director with a point of contact to discuss all matters relating to research progression and performance at monthly meetings. The SESRI Director is also a member of the Faculty's Research and Leadership Team and the Faculty's Leadership Team chaired by the Executive Dean, with responsibility for reporting and progressing research matters. In addition to the Faculty reporting structures, the SESRI presents its progress and activities yearly to a committee of senior staff chaired by the Deputy Vice-Chancellor for Research and Impact. Collectively, this management structure ensures the priority areas for the SESRI are identified, agreed and implemented.

2. People

Staffing

Ulster University recognises that the presence of leading researchers at the University is a prerequisite for the effective delivery of high impact, multi- and inter-disciplinary, and sustainable research. In response to this, the Department for Research and Impact has refreshed its strategy (2017-2022; see REF5a) to support the delivery of its research goals and aspirations. A clear strategic intent to recruit, retain and reward exceptional research staff was formalised, and this has been realised through several supporting actions, such as the recruitment of new researchers across the University and a formal institution-wide research sabbatical policy. In essence, the strategy is designed to create pathways to grow international expertise and develop staff in ways that help deliver our vision and objectives.

Since REF2014, SESRI has ensured that strategic appointments have been made to sustain, complement, and extend our research expertise aligned to the University's inter-disciplinary priority themes (e.g., Sustainability, Social Renewal, Healthy Communities, see REF5a). In the 2014-2021 REF submission period, we have grown our Category A staff by 45% to 19.2FTE. Of these, 10 Category A staff were submitted in REF2014, demonstrating both continuity and growth.

In this period, we made 9 additional appointments to strengthen research expertise and capabilities (Carlin, Mair and Fitzpatrick - Physical Activity and Health; McCabe - Sport and Exercise Biomechanics; Matthews and Bleakley – Sports Medicine; Paradis – Social Science of Sport; Metcalfe, McMahon – Exercise Physiology), of which 3 are Early Career Researchers (ECRs) (Carlin, Fitzpatrick, Matthews). During this reporting period, 3 staff (Bleakley, Mair, Metcalfe) left the unit to take up positions in other institutions, 1 took flexible retirement and reduced to a 0.2FTE (Wallace). 3 staff (Meade, Haughey, Kennedy) not included in REF2014 are returned in this submission. 6 staff received internal promotions during this REF period (Murphy to Dean of Postgraduate Research and Director of Doctoral College; Hassan to Associate Dean for Global Engagement; Liston, Haughey and Fitzpatrick to Senior Lecturer, and Ferguson to Reader). None of our Category A staff are due to retire in the forthcoming 5-year period, thereby providing stability and sustainability both in terms of the SESRI as a unit, and within the designated research centres.

In addition to the expertise of our core staff, we augment our research capabilities through our strategically appointed 7 Visiting Professors who provide support, mentorship, knowledge and expertise through their contribution to regular research seminars, advising and collaborating on grant applications and helping to translate our research into clinical practice. Professors O'Donnell and Trinick are medical consultants, and they provide a gateway to research investigations concerned with exercise and disease populations. Professors O'Donnell (Royal Victoria Hospital, Belfast), Trinick (Ulster Hospital), Mutrie (University of Edinburgh), Bailey (University of South Wales) and Woods (University of Limerick) are aligned to the Centre of Exercise Medicine, Physical Activity and Health, while Professors Skinner (Loughborough University London) and Nelson (Irish Football Association) provides expertise and guidance within the Centre for Sport in Society. Retired Visiting Professors within this REF cycle include Professor Nevill (University of Wolverhampton), Glasgow (Irish Rugby Football Union), MacAuley (General Practitioner) and Boreham (University College Dublin).

Conducting Research, Staff Training and Practice

Research Governance across the SESRI is administered via a number of mechanisms by which standards of research quality and integrity are maintained (for example ethics procedures and authorship policies). It is University policy that all research involving human participants must be reviewed through the filter and ethics committee process (our UoA has its own filter committee), as appropriate. In addition, specific mandatory training is provided for the SESRI staff and postgraduate researchers in research integrity (100% completion rate), the requirements of the Human Tissue Act and project audits, accessing the NHS and good clinical practice. Guidance is also available on authorship, assessing risk, obtaining consent and related matters. Postgraduate researchers and newly appointed staff are introduced to the requirements of the Code of Practice during their University induction. The Research Governance section carries out annual reviews of selected studies to ensure that they are in-compliance with procedures and appropriate legislation, and quarterly reminders are issued to all staff of the need to comply with procedures and standards, and of the expectation that they will contribute to maintaining a culture of quality and integrity in research in all disciplines. Strict guidelines are also in place to ensure authorship integrity is maintained and a 'Research Study Volunteer Complaints Procedure' is made explicit in all research proposals.

Supporting Equality, Diversity and Career Development of Researchers

The University has signed up to the Concordat to Support the Career Development of Researchers. Since 1998, when the Research Careers Initiative (RCI) was launched, the SESRI has embraced the University's initiatives designed to effectively implement all aspects of the Institutional Contract Research Staff (CRS) policy. The SESRI adheres to the University's policy to provide equality and diversity of opportunity to all and has endorsed the Code of Practice on the selection of staff and identification of outputs for the REF2021 submission, and the principle that all eligible staff were provided with the opportunity to participate in this REF cycle (see REF5a). SESRI has implemented all processes as outlined in the Code of Practice to ensure inclusivity and to maximise participation. All School staff attended a number of meetings with the Research Director and Head of School to identify those with a Significant Responsibility for

Research (SRR). With clear communication and constructive dialogue, the status of each staff member was documented with a signed agreement (SRR confirmed: 39% female, 61% male; 94.5% aged 24-55 years). For the only 2 staff categorised as SRR-pending, an agreed date was set for reappraisal with support offered by SESRI. All staff outputs were selected in an open and transparent manner, where each eligible member of staff had the opportunity to propose and rank their top outputs according to external reviewer scores; final selection was based on quality and final number required, with all staff having 1 to 5 outputs included. Feedback offered to staff regarding the assessment of outputs was concise and constructive, and all staff were informed of the final selection. Staff in this UoA involved in recruitment and selection of PhD studentships, placement and staff, have all undertaken equality, diversity and inclusion training. An institution-wide Equality Impact Assessment was carried out on the final selection of staff. The University is committed to the principles of the Athena SWAN Charter (see REF5a). The School of Sport obtained the Athena SWAN Bronze Award in 2017, recognising excellence in the areas of Science, Technology, Engineering, Mathematics and Medicine for Women in the HE Sector. Out workings include an uptake of female staff joining internal and external committees and boards, and female staff promoted to senior positions, e.g., Murphy to Dean of Postgraduate Research. Further, the University and SESRI adhere to the principles of the European Charter for Researchers and Code of Conduct for Recruitment, the Women's Network, and the Advance HE's Race and Equality Charter.

The University has a comprehensive suite of People and Culture policies that support the career development of our research staff. Support and development of early career researchers (ECRs) and their integration into a wider, supportive research environment is central to our staff development policy. Each of our ECRs has undertaken the Online Welcome & Orientation Programme and completed 4 online Mandatory Training Programmes during their probation period. In addition, our ECRs have undertaken a local induction co-ordinated by the Head of School (HoS) and the SESRI Director, with the aim of welcoming and introducing the researcher to their colleagues, assigning a senior research mentor, and ensuring s/he has the required information and resources to be effective in their new role. Each of our ECRs agrees a Personal Development Plan with the HoS and the SESRI Director via a Developmental Appraisal Review at the start of their probation period. This plan is reviewed on an annual basis to ensure a mutual understanding of performance objectives, and to agree the required support and development to achieve these outcomes.

Support and Development for our researchers is also provided via the University's Research and Impact CPD framework aligned to the VITAE UK's Researcher Developmental Framework. Ulster's Researcher CPD framework provides comprehensive options for staff on aspects of research progression and development. For example:

- SOARING (Significance and Originality in Academic Research: Interpreting New Guidance) is a support programme focused on further strengthening research outputs by increasing their quality. 7 staff availed of this opportunity.
- The IMPACT Development Series is a support programme designed to help researchers identify impact pathways and develop a planning methodology to deliver the impact arising from their research. 5 staff availed of this opportunity.
- RIGOUR (Research Income & Grant Opportunities for Ulster Researchers) is a new support programme designed to help academic researchers enhance and improve on the success rate of grant applications to external funding bodies. 8 staff availed of this opportunity.
- The UCommunicate programme helps develop excellence in research communication, and through a series of workshops, it equips researchers with the skills needed to translate complex concepts into clear messages. 3 staff availed of this opportunity.

- Aurora is a leadership development programme for women up to senior lecturer/researcher and professional services up to Grade 8, who demonstrate the ambition to develop as a leader in current or future roles. 2 staff (Liston and Carlin) availed of this opportunity, and Carlin now holds a leadership role in Learning and Teaching.
- The Wo/men's Network events provide a supportive and collegiate space to, build relationships and connections across the University; encourage personal and professional learning and development; and recognise and celebrate the achievements of women. 4 staff are active members of the network.
- The Research Mentoring Programme supports academic and research staff to build research capacity and capability. 4 SESRI staff have been mentored, while 3 staff have provided mentorship.

Ulster University has a robust Excellence Award Scheme, designed to support and recognise outstanding partnerships that have made a significant impact on our societies and economics, both nationally and internationally. The IMPACT related award stream in particular, rewards cutting-edge collaborations between researchers and external stakeholders, that aims to generate world-leading impactful research. Moreover, staff may be recognised through the University's Distinguished Research Fellowship Award Scheme; a highly competitive and rigorous award process designed to reward academic colleagues identified as international leaders in research. To this end, Murphy was the recipient of the 2019 Overall Champion Senior Distinguished Research Fellowship Award in recognition of expectational and impactful research.

Staff Workload and Funding Allocation

At a School level, a staff workload model is used to allocate teaching, research and administrative duties in a transparent and equitable manner, and in a way that maximises the potential for staff to return high-quality research, whilst at the same time deliver innovative teaching within the School. Research workload credits are set annually for the development of publications and writing of grants, developing and disseminating impactful research, presenting at national and international conferences, and supervising PhD researchers. Staff normally work to an allocation of 40% research time across the entire academic year. Research performance is a key priority, and all academic staff with research responsibility complete an annual Personal Research Plan, which facilitates workload allocation and CPD discussions. Within year teaching workloads are organised and designed to allow staff to avail of a reduced semester workload, thus facilitating research intensive periods and increased productivity. This approach works by module sharing and through a collaborative and supportive network of colleagues. This strategy also facilitated sabbaticals (6 months) for Murphy and Wallace in this REF cycle. Aligned to these sabbaticals, financial support allowed for a period of mobility to leading national and international centres of excellence (in Edinburgh, Australia, New Zealand) to collaborate on, and return high-quality outputs and prestigious grants. This period of dedicated research time also advanced an impact case study submitted in this REF cycle. University central funding to support research activities of the SESRI staff is provided via the Research Institute Budget Allocation. The method for allocation of Research Institute budgets involves a combination of QR earned and rewards for research grant activity. A major part of the annual budget allocation is based on the in-year QR income for the research area plus an allocation based on overhead recovery on grants for the previous 3 years. This annual budget is allocated by the SESRI Director to the SESRI members based on applications to support and develop their research, including staff development, participation in conferences, realisation of impact, and purchase of equipment and consumables. Support is also available via the School budget for research related professional development activities.

Postgraduate Researchers

SESRI postgraduate researchers comprise a vibrant mix of UK, Irish and international students, and play a key part in the research culture and environment by way of their focussed research projects, their involvement in all SESRI research events, and their engagement with their fellow postgraduate researchers both formally and informally. PhD researchers consistently return

scores above the national average (82%) for all components of the National Postgraduate Research Experience Survey (SESRI overall satisfaction 87%). We have increased our PhD completions by 162% in this cycle compared to REF2014, demonstrating growth and development, and our commitment to nurturing PhD researchers and developing future research leaders.

Government – Department for Economy (DfE) and internally – Vice-Chancellors Research Scholarship (VCRS) funded PhD studentships are distributed equitably across the research centres, creating sustainability and balance in our postgraduate researcher cohort. The SESRI staff co-supervise postgraduate researchers across a wide range of inter- and multi-disciplinary projects aligned to other UoAs (Biomedical Sciences, Psychology, Nursing, Health, Law, History, Business, Computing and Engineering). Where possible ECR staff are included on all PhD supervisory teams to enhance their capability and develop supervisory capacity for the future. Eighty per cent of our doctoral researchers were/are full-time, and receiving competitive and prestigious DfE and VCRS awards, or a DfE Cooperative Award in Science and Technology (CAST) in partnership with external industry funders. One full-time PhD researcher is funded by a competitive Northern Ireland Chest, Heart and Stroke award. The unit has also been home to 7 PhD researchers completing via a part-time self-funded route.

In 2017, the University made a significant, strategic investment in postgraduate research with the inception of a new Doctoral College to ensure a consistently excellent PhD researcher experience across the University. PhD researchers are recruited, given access to appropriate training, mentored, and monitored by the SESRI's Postgraduate Tutor (McCabe) in conjunction with the Doctoral College. SESRI PhD researchers avail of a plethora of training opportunities through the Researcher Development Programme, aligned to the VITAE framework, comprising a suite of workshops, specialist skills sessions, online courses and personal development planning activities which provide SESRI postgraduate researchers with experience and skills required to be a world-class researcher. Further, each SESRI PhD researcher is offered the opportunity to present their work at the annual Doctoral College Festival of PhD Research, and actively encouraged and supported to participate in the regional and national 3-Minute Thesis 3MT® competition. All SESRI PhD researchers are provided with the opportunity annually to complete the Postgraduate Research Experience Survey to provide valuable feedback to the SESRI Director and Postgraduate Tutor on matters relating to research skills, supervision, resource, culture, progress and assessment, professional development, opportunities, and their overall experience.

The Doctoral College provides a support grant of £900 per annum to each DfE and VCRS funded researcher, which, in conjunction with the SESRI funds, enables data collection or field work, and participation in conferences and seminars. In addition, financial support from external grants awarded to staff are also used to support the laboratory work of their PhD researcher teams. The SESRI has excellent postgraduate facilities. All full-time researchers are provided with a designated individual workspace in newly acquired, open-plan offices close to the laboratories. Part-time students have access to bookable shared workstations, in addition to bookable access to our research laboratories, our research staff, and have support from a team of full-time laboratory technicians.

The SESRI provides training in discipline-specific research techniques (for example qualitative and quantitative statistics, bio-analytical assessment, exercise and fitness evaluation, physical activity measurement) via workshops and/or tutorials and promotes and supports multi- and inter-disciplinary research with other Faculty initiatives such as joint PhD supervision. SESRI staff are all engaged in postgraduate research supervision, with each PhD researcher having a minimum of two supervisors with at least one having successfully supervised to completion. The Postgraduate Tutor ensures that researchers receive training in relevant research methods and generic skills and organises 2 progress seminars during the first year of study (initial and confirmation), and a further final year seminar. In addition, PhD researchers and supervisors' complete annual reports to ensure any progress or supervisory issues are identified and overcome in a timely manner. Postgraduate researchers are also supported by other activities

within SESRI such as journal clubs, research group seminars and Faculty-wide initiatives such as the *Grow-Ur Network* programme, which provides funding to support a unique opportunity for SESRI PhD researchers to link with a world-leading researcher outside Europe, with the view of spending time in an international laboratory collecting unique data leading to an internationally co-authored publication. Our researchers have also availed of funding through the Erasmus+ programme to facilitate visits at European Centres of Excellence (Frederich Alexander University – Germany, University of Zurich - Switzerland, University of Bologna - Italy) to work collaboratively with internationally renowned researchers.

3. Income, Infrastructure and Facilities

Income

The Unit's strategy for generating grant income is both multi- and inter-disciplinary in focus with a targeted approach that incorporates a blend of ECRs, junior and senior researchers. The strategy includes capitalising on a strong experienced staff base in a given research area (e.g., physical activity and health), focussing on a mix of funding bodies, building capacity to target particular funding calls, and diversifying to focus on specific income streams. An example of the successful outworking's of this strategy includes Murphy's £592K award leading to impactful and high-quality publications. The University's Research Development team is Faculty-facing, and includes dedicated Faculty Research Managers, a Global Manager and a Strategic Research Development Manager who horizon scan, and source opportunities to build large scale, high-quality and multi-disciplinary applications. At a Faculty and Unit level, we have full-time Research Managers and Officers who over-see and support all applications from conception through to submission, and a School Officer who manages resources and provides regular grant management information. Research Development provides an open and competitive opportunity to secure seed funding, and pump priming for identification and development of projects and bids through a Research Development Strategy Fund, Collaborative Research Fund and GCRF pump priming (Davison successful in 2018). In addition, the Department offers expert review services and PhD match funding to strengthen strategic, prestigious and inter-disciplinary applications. Our unit works closely with Global Engagement and Development & Alumni Relations to identify partnerships to strengthen funding applications and leverage financial support. The University's Thematic Leads work closely with the Associate Dean for Research & Impact and, the unit's Research Director to promote and identify opportunities for greater multi- and inter-disciplinary research collaborations, as well as with external partners and with international collaborators.

Current income across this REF cycle equates to £2,287,818 as indicated in Table 2 below.

Table 2. SESRI Income Overview

2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
£267,848	£332,345	£251,055	£351,997	£298,676	£359,158	£426,736

The majority of income is spread across 40 grants, and the SESRI members have been proactive in securing funding to support their research aspirations and activities. These awards include competitive funding from Research Councils, UK central government bodies, and UK-based charities. Other sources include EU, UK industry, and EU government bodies. Examples of inter-disciplinary cross-Faculty awards include 2 of the 11 Cross-Border Health Intervention Trials funded by the SEUPB Interreg of £592K and £313K that involved SESRI staff (Murphy and Carlin) and colleagues from the Biomedical and Health Sciences UoA's, Carlin's Engineering and Physical Sciences Research Council award of £39K with Biomedical Sciences, Murphy's NI Chest, Heart and Stroke £114K award with Biomedical Sciences, and Davison's Public Health Agency award of £38K with colleagues in Health Sciences. Examples of awards with external partners include Davison's collaboration (£100K) with colleagues at the University of Sharjah (UAE), and the CEC-H2020 award (£203K) that involves the SESRI with researchers from De Montfort University, Universitat Passau and the Austrian Institute of Technology. Other international grants include those by Darby (£11K) from UNICEF, Kitchin (£10K) from UEFA, Murphy (£39K) from CEC-Erasmus and £29K from MRC JPI DEPIPAC initiative, and £38K

awarded to Davison from Contego Ireland. SESRI is expecting to secure a further £1.2M from the Thomas Charitable Fund and NIHR Public Health Research for projects relating to physical activity and health.

Infrastructure and Facilities

Building on an investment of circa £1.5M in the last REF cycle, SESRI has continued to receive significant support from the University to further develop its world-class range of exercise physiology, biochemistry, and biomechanics laboratories. These laboratories are managed by three technical support staff and consist of a range of highly specialised research-intensive equipment including an Electron Paramagnetic Resonance (EPR) spectrometer, High Performance Liquid Chromatography (HPLC), LightCycler 480 Real-Time PCR system, Agilent 2100 Bioanalyzer, DNA-Microarray Analyser, DEXA scanner, state-of-the-art Hypoxic Heat chamber, 5 large Kistler Force Plates (permanently installed in biomechanics laboratory and indoor-running track), a 12-camera Qualysis Motion Capture System, 4 CODA CX Scanners and a Mobile-Eye GT-ME Eyetracker. New, fully equipped exercise physiology laboratories were strategically established on our Magee and Coleraine campuses to allow for the completion of regionally targeted research projects. These laboratories comprise ultramodern physiology, biochemistry, and psychology-based equipment. All laboratory facilities are crucial to staff and PhD researchers regarding data collection for high-quality publications, the servicing of grants, and for generating impactful research. Indeed, staff regularly use the laboratory facilities to disseminate impactful research via television and other media outlets (see section 4). New world-leading, and purpose-built Sport and Exercise Science facilities (745.3m² existing vs. 958.26m² new facilities) will be made available through SESRI's relocation to the £365M+ Belfast campus development (75,000m²) scheduled for opening in September 2021. This new infrastructural investment will guarantee the future development and sustainability of SESRI research.

In 2018, the University established a new inter-disciplinary Institute for Mental Health Sciences with the strapline '*from gene to gym*'. SESRI is a key player in this University-wide Institute and further develops our impactful work in sport and mental health research; contributing to an impact case study aligned to our REF2021 submission. In addition, SESRI has access to a range of shared facilities across the four University campuses, allowing for innovative and unique impactful research aligned mainly to the Centre for Exercise Medicine, Physical Activity and Health (incorporating molecular biology/cell-culture approaches, genetics and epigenetics within the brain and behaviour research within the £5M brain mapping facility, optometry, immunology and microbiology). This shared facilities approach provides opportunities for inter-disciplinary research on emerging exercise in health and disease concepts (e.g., Davison and Murphy hold inter-disciplinary PhD researcher awards with the Genomic Medicine and Ophthalmology research groups respectively). Moreover, Kitchin also holds an inter-disciplinary PhD researcher award with colleagues in the Business School to examine sports betting. Collectively, this cross-Faculty and inter-disciplinary approach sustains future world-leading scholarship.

4. Collaboration and Contribution to the Research Base, Economy and Society

All members of the SESRI are actively encouraged and supported (via external grants, the SESRI research strategy budget, the School of Sport, and the central University research strategy budget) to contribute to the enrichment and development of the research base in sport and exercise sciences, as evidenced, and achieved through the following:

- **Contribution to the Discipline:** Since 2014, staff have contributed to their respective disciplines through a plethora of activity. Primary amongst these is the publication of research papers, research reports, chapters and books and wider research activities including journal reviewing, editing, and multiple, external examining duties for research degrees across numerous countries. The SESRI members and postgraduate researchers regularly participate in international, national and regional discipline-specific and inter- and multi-disciplinary conferences and workshops, as keynote and invited speakers, as well as through oral and poster presentations ($n=>50$). Examples of keynote and speaker invitations include: Murphy – European College Sport Science, European Network for the

Promotion of Health Enhancing Physical Activity (HEPA-Europe); Davison – American College Sports Medicine, Physiological Society; Darby – UNICEF UK, Harvard and Oxford Universities; Fitzpatrick - European Sports Network for Rehabilitation of Persons with Disabilities; Wallace – PGA, World Scientific Congress of Golf; Carlin – International Society of Behavioural Nutrition and Physical Activity; Kitchen - UEFA; Breslin – British Psychological Society, Royal College of Psychiatry.

The SESRI has also organised national and international conferences including the European College of Sport Science Annual Conference (2018), British Psychological Society Division of Sport and Exercise Psychology Annual Conference (2018), HEPA-Europe Annual Conference (2016), Royal College of Psychiatry Annual Conference, and the Sports History Ireland Conference (2017). In 2019, Ulster (SESRI) was awarded, and will host the European Sport Management Conference 2022.

- Networks and Industry Collaborations:** The SESRI members are involved in a range of national and international networks and collaborations, and they make a substantial contribution to the discipline through their involvement in professional and learned societies. Examples include: Murphy is a member of the UK Chief Medical Officer's (CMO's) expert advisory group on physical activity and board member of the International Society of Physical Activity and Health (ISPAH) and Vice-President of HEPA-Europe. Murphy also sits on the Department of Communities Strategic Board within the Northern Ireland Government. Murphy's involvement with the UK government in this capacity has contributed toward a high-quality impact case study in this REF cycle. Davison is an invited member of the Finnish National Academy of Science, Advisory Board member of Vertex Pharmaceuticals (USA), and research exercise physiology lead at the Automobile Touring Club-UAE; Wallace is Biomechanics advisor to The R&A Rules Ltd, European Disabled Golf Association, and the European Tour Performance Institute; Liston is a founding member of the Women in Sport Research Group at Sport Ireland; Kitchin is a member of the Irish Football Association's Disability Access Working Group; Breslin is Chair of the Wellbeing in Sport Action Plan Research Group in Sport Northern Ireland, and a member the British Psychological Society Task Force Committee responsible for guidance on managing COVID-related anxiety when returning to the workplace. Carlin and Murphy lead the ISPAH Global Physical Activity Observatory Country Card for Northern Ireland and the Active Kids Alliance Children & Youth Physical Activity Report Card for Ireland (all-island).
- World-Leading National and International Collaborations:** SESRI members are involved in collaborative research on a national and international scale (n>20). Examples of individual collaborations with international and national centres of excellence include those by Davison (August Pi i Sunyer Biomedical Research Institute Spain, University of Oslo, University of Cambridge); Kitchin (Australian Centre for Olympic Studies Sydney, Sport Business Research Centre Birkbeck College London, and UNESCO); Hassan (Griffith University and University of Technology, Australia). Staff holding Visiting Professor positions at a range of national and international universities including, Hassan at Loughborough University; Wallace at Loughborough University; Murphy at Edinburgh, Bristol, Deakin, and Breslin at the University of Nevada. These partnerships have led to a number of joint initiatives, including research projects, funding applications, high-quality research publications, research student supervision, and research impact nationally and internationally. For example, collaboration by Murphy with colleagues at Public Health England, Sport Ireland, Sport NI and Student Sport Ireland have led to a number of research publications, whilst Wallace's collaboration with The R&A Rules Ltd led to three prestigious CAST PhD studentship awards and joint publications. A collaboration by Breslin has led to (1) the development of an international consensus statement on psychosocial and policy recommendations on impact health and sport, (2) the development of a six-year national wellbeing in Sport Action Plan, thus providing the basis for a world-leading impact case study.

- **Other Discipline-Based Relationships** include the American College of Sports Medicine (Fellows – Davison, Murphy; member McClean, Wallace), British Association of Sport and Exercise Sciences (Fellow – Murphy), North American Society for the Psychology of Sport and Physical Activity, British Psychological Society (Breslin); European Sport Management Association, and The Football Collective (Kitchin); Nutrition Society and Sport and Exercise Nutrition Register (McNeilly); The Physiological Society and Genetics Society (Davison); The North American Society for the Sociology of Sport (Hassan); The International Society for Biomechanics in Sports, the International Sports Engineering Association (Wallace).
- **Journal Editorships and Grant Committees:** The SESRI members provide service to the discipline through their contribution to managing and assessing the quality of research outputs by way of editorial roles across the Sport and Exercise Sciences. Examples include: Physiology and Nutrition Executive Editor Journal of Sports Sciences, Associate Editor Frontiers in Physiology, Editorial Board World Journal of Diabetes, Guest Editor Antioxidants (Davison); Advisory Board Journal of Sports Sciences, Associate Editor BioMed Central Public Health, Associate Editor International Journal of Behavioural Nutrition and Physical Activity (Murphy); Associate Editor Managing Sport & Leisure, Editorial Board International Journal of Sports Management and Marketing, International Journal of Sports Marketing and Sponsorship (Kitchin); Biomechanics Executive Editor Journal of Sports Sciences, Editorial Board Journal of Sports Engineering and Technology (Wallace); Advisory Board Journal of Sports Sciences (McClean); Editorial Board Soccer and Society, Advisory Board *Impumulelo*, Guest Editor African Historical Review and Sport in Society, former member of the Economic and Social Research Council, and Peer Review College (Darby); Editor-in-Chief Human Figurations, Editorial Board Irish Journal of Sociology (Liston); Deputy Executive Academic Editor Sport in Society, Editorial Board Soccer and Society (Hassan); Editorial Board Journal of Public Mental Health, International Journal of Sport and Exercise Psychology Reviews, Case Studies in Sport and Exercise Psychology (Breslin). SESRI members also act as reviewers for competitive grants for national and international organisations such as the Biotechnology and Biological Sciences Research Council, Medical Research Council, Heart UK, Diabetes UK (Davison); Northern Ireland Chest, Heart and Stroke (Murphy); National University of Ireland Post-Doctoral Fellowships in the Humanities, Horizon2020-Marie Skłodowska Curie COFUND programme (Darby); Economic and Social Research Council (Breslin).

SESRI members have made a **Significant Contribution to the Economy, Society and Industry** through active engagement and participation in government policy agendas and other activities:

- In the first initiative of its kind in the UK, Murphy and Liston contributed towards the Northern Ireland Assembly's Research and Information Service by delivering a keynote address (on Physical Activity and Gender) to elected representatives of the NI devolved government and policy makers as part of the Knowledge Exchange Seminar series (KESS). Moreover, Murphy and Carlin presented to the KESS examining physical activity patterns in adolescent females (February 2018). Hassan delivered a keynote address to KESS examining a range of societal effects of participation in sport.
- Breslin delivered keynote addresses to the Teachers Union on mental health and wellbeing in sport (Sept 2019), and on physical activity and wellbeing to the Northern Irish Government as part of the British Psychological Society community engagement series of lectures (2014). As part of an impact case study returned in this REF cycle and aligned to the local Governments' Wellbeing in Sport Action Plan (2019-2026), Breslin and Haughey delivered 59 mental health awareness workshops across a range of sports.
- McClean delivered an invited keynote to staff from the Department of Justice as part of their Health and Wellness initiative (2019).

Unit-level environment template (REF5b)

- Darby, Kitchin and Liston hosted two Economic and Social Research Council Festival of Social Science workshops (2018, 2019). This ESRC Festival incorporates 300 events with 34 UK partners.
- Significant International contributions include Davison's involvement with the Automobile Touring Club-UAE motorsport programme (Dubai, Abu Dhabi, Muscat-Oman), while Darby was involved in a range of high-level impact generating initiatives such as collaborative research funded by UNICEF UK on the protection of children's rights in the global football industry. The research was presented to UNICEF global staff via an internal webinar event (May 2019), a closed football industry event in London (May 2019), and to senior staff at FIFA Headquarters in Zurich (June 2019). This work will form the basis of an impact case study in the next REF cycle. Wallace has made a significant, and impactful contribution to The R&A and the United States Golf Association Distance Insights Report (2020) that examines impact of driving distance to support a sustainable future for golf.
- SESRI members regularly provide research informed expert commentary to the broader local, national and international media and other cultural outlets. Researchers have engaged in documentaries and debates on national radio and television programmes such as BBC Radio Ulster; BBC Radio 4; UTV Radio; RTE Radio; Newstalk Radio; The One Show (BBC); Spotlight (BBC); 'Trust me I'm a Doctor' (BBC); 'Food Unwrapped' (Channel 4). Carlin, Murphy, Liston, Matthews, Shannon and Breslin have made a significant contribution to the RTE Brainstorm initiative where the academic and research community contribute to public debate, while reflecting on local and global societal issues. Internationally, SESRI staff regularly bring their research expertise to bear on radio, television and print media including: BBC World Service; Sky News; Khaleej Times; Gulf News; The Washington Post; NBC Sports; Der Spiegel International; Boston Globe.