# Institution: Leeds Trinity University

# Unit of Assessment: 24 - Sport and Exercise Sciences, Leisure and Tourism

Presentation of last names throughout the text adheres to the classifications defined below. Other mentions apply to staff external to the Unit, and/or institution as specified.

- Academic staff member assigned to Unit of Assessment (UoA) 24 on a standard academic (teaching and research) with (last name) or without (LAST NAME) significant responsibility for research (SRR) as defined by the approved Code of Practice, employed by Leeds Trinity University (LTU) on (as described) or after (*last name*) 31/7/20. NB: No research-only posts apply for UoA24.
- <u>Last name</u>: Staff previously employed as Category A eligible who left the institution before 31/7/20.
- Last name: Postgraduate research (PGR) student as of 31/7/20.

## 1. Unit context and structure, research and impact strategy

The School of Social and Health Sciences (SSHS) at Leeds Trinity University (LTU) includes the Departments of Sport, Health and Physical Education (SHAPE) and Social and Behavioural Sciences (SBS). In 2018, these Departments were organised into a single School to facilitate an interdisciplinary synergy between sports scientists (including nutritionists, physiologists, biomechanists), coaches and physical educationists, and psychologists (including health-related specialisms) to work together in a vibrant research environment. Unit of Assessment (UoA) 24 primarily represents the work of SHAPE where the Head of Department (HoD) has overall responsibility for the Unit's research, knowledge exchange (KE) and impact activities. This is supported operationally and purposefully by the members of the institutional Professors and Readers group (**Barwood**, <u>Cooke</u>, **Lloyd**, **Russell**) and the Research and KE Champion (**Arjomandkhah**) that are embedded within the Department.

Housed primarily in a single building incorporating specialist sports laboratories and facilities, UoA24 has been through a period of strategic re-alignment since REF2014. From inception to delivery, the Unit has benefited from support from LTU, including funding for new appointments and collaborative working (see section 2), and improvements to infrastructure and facilities (see section 4). Accordingly, growth in additional areas of activity and enhanced capacities for collaborative working that aimed to produce more innovative, high quality, and applied research outputs that are translational and impactful in nature has occurred. The current REF output submission includes 8.0 category A staff FTE (Arjomandkhah, Barwood, Davis, Lloyd, Radcliffe, Rowley, Russell, Sellars), including 1.0 FTE Early Career Researchers (ECR) and a previously employed colleague (Hobbs). Further KE, impact and professional practice contributions exist across the Unit from numerous others (Aben, Beaumont, Curtis, Gannon, GRACE, GREEN, Haluch, Hills, LANCASTER, MCDONALD, MCDONALD, ROWLANDS, ROWLANDS, Starr, Taylor, White). Previously, 3.0 Category A staff FTE were submitted to REF2014 in the areas of physical activity and health, biomechanics, and sports psychology.

Since 2016, our vision and mission in UoA24 has been to find new ways to support the physical activity, movement and performance needs of a diverse range of communities; be it elite athletes performing at the highest levels and/or in extreme environments, children engaging in physical education, learners across the life-course, elderly exercisers, 'hard to reach' and at-risk physically inactive groups and those recovering from illness or injury. Accordingly, since REF2014 we have reassessed our approach to research and refocused our research themes alongside the development of Trinity Performance (<u>http://www.trinityperformance.co.uk/</u>); a KE and consultancy arm promoting end-user engagement which facilitates the uptake of the applied research that we conduct with stakeholders both within and beyond the immediate boundaries of UoA24. The Unit's research now addresses two major dynamic multi- and inter-disciplinary themes, being:

1) Enhancing Human Performance: Led by **Russell**, has strength in team sports performance and almost exclusively involves research with application to Olympic, elite or professional



- sports men and women or top-level junior athletes (as exemplified in the two impact case studies submitted)
- 2) Improving Health and Wellbeing throughout the Lifespan: Led by **Barwood**, with a particular strength in the effects of safety behaviours to reduce the risk of death by drowning, and growing expertise in supporting the physical activity and health needs of a diverse range of communities including children, through adulthood, to elderly individuals and clinical and at-risk populations.

In REF2014, the focus was very much on laying the foundations for future development of research capacity. During the subsequent census period, we have exceeded all the aims cited, having:

- 1) Significantly increased the volume of outputs in leading international peer-reviewed journals (some 150 journal articles),
- 2) Ensured the impact of this work on academic and user communities (exemplified in our submitted impact case studies),
- 3) Grown our research leadership capacity (section 2),
- 4) Recruited staff with significant research potential with complementary skills to areas of identified strength (section 2),
- 5) Sought to enhance the quality of our outputs and environment through peer- and seniormentoring,
- 6) Significantly increased the number of Category A eligible staff submitted while developing the talent pipeline for ECR's through doctoral supervisions.

Moving forwards, and aligning to both LTU's and the Unit's vision and mission, the aims are to:

- Capitalise on LTU's ~£140,000 investment in the forthcoming Sports Science and Sports Therapy Centre, ready in late 2021, which will host flagship new multi-purpose laboratories that are aligned to the research and impact interests of the Unit,
- Maintain the trajectory of increasing the number of research active staff, by expanding existing research strengths via sustainable academic appointments made in carefully selected research fields, and recruiting, developing, and retaining high-calibre academics,
- 3) Continue the growth of a strong postgraduate research (PGR) student community with high completion rates,
- 4) Further improve the physical environment for research and strengthen the research culture,
- 5) Maintain current, and forge new, strong strategic partnerships that widen and enhance the impact of our research outside of academia and to promote KE, business engagement and commercialisation,
- 6) Continue to develop the careers of researchers through intensive mentoring and fostering the research- and impact-led culture across the Unit,
- 7) Increase the research and consultancy income generated by the Unit.

The Unit has sought to enable and/or facilitate the achievement of impact by working with numerous businesses and organisations regionally, nationally, and internationally to co-create practice-based research and new knowledge that delivers real-world impact. Our strategy involved taking our applied research and co-constructing research agendas with academic and end-user groups. We then developed academic partnerships to add research expertise to the topics under investigation. Finally, we developed user partnerships that enabled impact on applied practitioners. This approach is exemplified by the impact case study led by Russell where the practices of elite rugby and soccer players competing for top tier domestic and internationalstandard teams both at home and abroad, have been improved. In this instance, the partnering organisation (Hull City AFC) were fundamental to informing and executing the co-creation of knowledge, which was then subsequently shared with practitioners nationally and internationally. Likewise, **Barwood's** work has informed authoritative consensus statements regarding the use of specific nutritional ergogenic aids and is being used by elite athletes in Australia. Outside of the impact case studies submitted, the Unit's work with partner organisations is further exemplified by Gannon being the Education/Technical Director at Welsh Gymnastics, and Barwood being mentioned specifically in the Physiological Society's report evaluating the impact of Sport and Science Education the UK economy (https://guildhe.ac.uk/wp-Exercise on content/uploads/2019/05/SES-FullReport-Final\_compressed.pdf). Our PGR students also



exemplify this approach with many occupying dual roles as both practitioners and researchers (e.g., Aben was a Strength and Conditioning Coach with Castleford Tigers RLFC, Curtis is a consultant nutritionist to the English Rugby Football Union, Queens Park Rangers and Crystal Palace Football Clubs, Starr is a consultant nutritionist in professional cycling, and White is a National Goalkeeping Coach with the English Football Association); therefore helping to embed the Unit's research into applied practice. To further exploit opportunities to embed our research into practice, all Unit members contribute to Trinity Performance. Notable examples include the support given to the talent development of national level gymnastics competitors for resilience and mental toughness training (**Radcliffe**).

As highlighted, fundamental to our development and aligning to the Unit's impact strategy was the stimulation of research partnerships and networks regionally, nationally, and internationally. Founded on the reputation of leaders in their respective fields, the Unit now has signed memorandums of agreement with international leaders (i.e., Australian Catholic University; ACU, Football Science Institute) in research and impact activities allied to the UoA24 submission. Consequently, we have hosted international conferences (i.e., Sports Science Summit 2018, 2019) seeing in excess of 150 speakers and delegates attend LTU from all over the world and attracting world-leading international academics and postgraduate students to visit the UK. Such activities have provided further opportunities for staff and PGR students alike and have facilitated networking opportunities that have then materialised into the generation of research impact – both within and outside of that included in the submitted impact case studies. Additionally, honorary appointments are targeted to foster collaboration with key academic and industrial partners and end-users. For example, Professor Shawn Arent (University of South Carolina: leading sports science University in the USA) has contributed expertise to our Unit's PGR's (see submitted outputs) and has helped to broaden exposure of both staff and students to new methods.

In agreement with our Unit's mission and values, our applied, problem-focused research requires interdisciplinary investigative designs. Accordingly, substantial overlap on projects and PGR studentships allows new research methods to be added to the investigations being undertaken and facilitate the development and thinking of PGR students and staff alike while also being sensible from a supervisory capacity perspective. For example, investigating the effects of transcranial direct current stimulation in sedentary and overweight people involves both UoA24 (Barwood, Davis, Russell) and UoA4 (Dalton) staff members with combined expertise in physiology, behaviour change and psychology. Such collaborative supervision arrangements (supervising Beaumont) have facilitated an interdisciplinary approach to exploring the neurophysiological correlates of eating and exercise behaviour, such that the topic is holistically investigated from the perspectives of a number of separate but complementary disciplines. The same is true for our collaborative supervision of St-Quinton who completed within the census period following supervision by UoA24 and UoA4 staff. Likewise, Hudson's work utilised aspects of physiology, biomechanics, and psychology to explore the effects of load carriage. Further examples include the work of Radcliffe and Rowley supervising Haluch exploring the complexities of applied practice when working in sport psychology.

Supported by dedicated Library staff and recognising the benefits to the public and external stakeholders of unrestricted access to research outputs, UoA24 operationalises LTU's default Open Access (OA) approach; primarily via the green OA route linked to LTU's acquisition of the PURE repository. Likewise, the Unit encourages registration of all colleagues with ORCID. Such practices ensure that the Unit's research and KE outputs are openly available and accessible while facilitating rapid dissemination, and increased engagement by partners, stakeholders, beneficiaries, professional practitioners, and the wider public. The Unit also encourages timely reporting of impact and sharing of results from staff activities by a number of different means, including:

- Social and Digital Media: Evidenced by the Unit's staff recording an upper bound of more than 2,000,000 followers interacting with the outputs that they have produced over the census period,
- Conferences and Events such as the Sports Science Summit featuring high-profile speakers and special guests,



• Press Coverage, either through internal LTU channels or specialist external media to maximise coverage.

The Unit supports OA funding requests from a central budget with preferential outcomes being favoured for strategically important manuscripts that are submitted to journals where authors are required to make study protocols, datasets, and codes available on publication (e.g., PLoS One; see impact case study underpinning research). Similarly, the Unit endorses (where possible) the inclusion of specific reliability studies in the theses of the PGR's supervised by its staff (e.g., **Davis** and **Russell** supervising Aben; <u>https://www.mdpi.com/2075-4663/8/5/73</u>) and the use of reporting checklists to improve the reporting of research methods. Detailed and clear data management plans are also required for all projects, and staff are encouraged to publicly pre-register research by posting to a suitable repository (e.g., PROSPERO). The Unit also actively encourages publication of all research outcomes, including negative and null results and replication studies (where applicable); intentions that are made clear to external collaborating parties in our bid-writing processes.

In UoA24, we are committed to supporting a research environment that is underpinned by a culture of integrity and based on good governance, best practice, and support for the development of research active staff and students. Early in the census period, research expertise and confidence amongst the Unit's staff were highlighted as key areas for improvement. Ambitions to create research leadership and co-ordination roles have been realised by the appointment and internal promotion of research leaders (**Barwood, Russell**) at Reader and Professorial levels; notably, three Professors (<u>Cooke</u>, **Lloyd, Russell**) and one Reader (**Barwood**) contribute to this UoA24 submission.

Creating a healthy research culture is key to preventing lapses in research integrity and would help to ensure that a career in research within our Unit is attractive to those who value rigour, accuracy, honesty, and transparency. Acknowledging the role of training as an approach to minimising lapses in research integrity, the Unit facilitates access to staff training in research ethics; both at committee reviewer and applicant levels (via the University of Leeds). This training is also embedded within the undergraduate studies of our Unit's students; ensuring that research ethics and integrity are mandatory core elements of all the taught research methods, curricula ensures that future generations of researchers are properly informed and that due attention to these issues is given in all research undertaken on taught courses. Training on ethics and integrity is also mandatory for the Unit's doctoral students and is included in the research supervisor training programme. Notably, in the Postgraduate Research Experience Survey (PRES) 2020, 100% of the Unit's respondents mostly and definitely agreed with the statement: "My understanding of research integrity (e.g., rigour, ethics, transparency, attributing the contribution of others) has developed during my programme." Future ambitions to encourage the Unit's research teams to engage with statisticians as part of their research, and to improve the statistical competencies of researchers in UoA24 highlight our ongoing commitment to research integrity generally.

# 2. People

# Staffing strategy and staff development

The Unit provides a vibrant, supportive, and collaborative research environment to facilitate staff and students to flourish in their strategically aligned research and impact activities. As of the census date the Unit's structure consists of two Grade 10/Professors, two Grade 9/Readers, eight Senior Lecturers, three Lecturers, one University Teacher, one Graduate Tutor, and one Technician. This range of experience and skills enables us to provide research and impact career development opportunities for all staff, including mentoring for junior staff, and development of leadership roles for senior colleagues.

Research, impact, and KE-specific mentoring is primarily offered by **Barwood** and **Russell** and facilitates orientation with ethical review processes, university-wide internal funding calls, planning and capturing impact, and research repository training, amongst others as required. Staff development funds (i.e., for training, conferences, professional development) are provided through a competitive bidding process within SSHS and are funded strategically from central research



accounts. Start-up costs, minor consumables and specific pieces of capital equipment can be negotiated on a case-by-case basis with the SSHS board; of which there is significant representation by staff from UoA24.

Over the census period, provision of periods of study cover, travel, subsistence, and small equipment/consumable costs have equated to £23,000 for the Unit's PGRs and £8,000 for staff. Unit staff have also been supported with £6,000 of funding for conference attendance and have also been eligible to compete for institutionally-funded PhD studentships (including match-funded PhD student programmes targeted at those staff in receipt of external research funding or significant benefit in-kind). In the case of the latter, staff have been successful in securing more than £250,000 from internal funds for PhD stipends and more than £80,000 in tuition fee waivers over the census period.

All staff and PGR students can draw on peer-mentoring at the many internal development events delivered by the Unit (i.e., SSHS Research Engagement Seminars, Research Days, Away Days). Aligning to the Unit's mission and values, the Unit hosts a monthly interdisciplinary Research Engagement Seminar Series where staff, PGR students and external collaborators are invited to discuss their applied, problem-focused research, impact and KE activities irrespective of the stage of project readiness (i.e., from initial inception ideas to dissemination post-completion). LTU is not currently a signatory of the Concordat to support the Career Development of Researchers but the Unit adopts the principles thereof as mentioned in the University Research Strategy (2018-2021).

While the headcount of staff on the census date has remained roughly similar to that in REF2014, a natural turnover of individual staff has occurred during the census period. We have sought to use such changes as an opportunity to think more about cross-boundary collaboration and to reshape the academic profile of the UoA by recruiting ECRs and those who do not meet the definition of the REF ECR status but have had limited supervision and examination experience -- termed early-stage researchers (ESRs) – with demonstrably high potential to be future research leaders, in strategic priority areas, and focusing the efforts of more senior colleagues on supporting their development through mentorship.

We have appointed established research-active academic staff that align to the Unit's research themes. One Professor (<u>Cooke</u>, who was the founding Head of School in 2015 and became the University Lead for Research in 2018), two Readers (**Barwood**, **Russell**; with **Russell** promoted to Professor in 2018, and becoming Interim Institutional Co-Lead for Research and KE in June 2020), one HoD (**Sellars**), and four new tenured academics (**Arjomandkhah**, **Davis**, **Radcliffe**, **Rowley**) have been appointed during the census period. Strengthening the area of Enhancing Human Performance in 2016 (**Barwood**, **Davis**, **Russell**), complemented the expertise offered by existing researchers (<u>Cooke</u>, **Lloyd**, **Radcliffe**, **Rowley**) and has substantially raised the quality and volume of work undertaken. Similarly, research capacity in our Improving Health and Wellbeing throughout the Lifespan theme is growing and has been improved by appointments of **Arjomandkhah**, **Barwood**, and **Davis**. The recent recruitment of *Taylor*, *Gannon* and Hills to standard academic contracts is already benefitting the Unit's depth and sustainability.

A central component of our future strategy is that current colleagues will play a major role in our success over the forthcoming years by securing external grant income, developing their own research sub-themes, and leading and conducting academically rigorous work with measurable impact on scholarship and society. It is therefore important to the Unit's sustainability and succession planning that 100% of submitted staff were on permanent open-ended contracts, and to ensure that procedures were more than "one-deep" by allocating deputies to critical process-oriented and leadership roles.

To help achieve our research aims, the UoA has been supported institutionally to lead on the revision of academic staff appointment procedures to ensure that only research-active staff are appointed to academic roles. Accordingly, ongoing research activity and/or considerable professional experience, combined with a completed or near completed PhD are essential requirements for all new positions in the Unit employed as per the standard academic contract. Moreover, to ensure that the Unit's research aspirations are prioritised in the appointment of all new staff, research Professors (who have attended mandatory interview and equality and diversity



training; including unconscious bias awareness) are involved in the academic selection process. This approach has ensured that focused research groups can be developed, critical mass can be established, succession planning can occur, and research aspirations can be realised.

Due to internal mentoring within the Unit, and external staff development opportunities (i.e., research degree supervisor and examiner training) provided by LTU's accrediting partner for research degrees (i.e., University of Leeds), UoA24 has a growing number of experienced PGR supervisors and examiners. This was achieved during this REF census period by purposefully increasing the opportunities for ECRs and ESRs. Formally naming both ECRs and ESRs on supervisory teams to allow working with experienced staff when co-supervising and examining PGR students, has resulted in all eight of the submitted staff in UoA24 being eligible to supervise PGR students under the accrediting partner's regulations, and 63% of these being eligible to independently examine research degrees as an internal examiner. This is not only important from capacity and sustainability perspectives, but also a massive step change compared to REF2014 where no staff were eligible to act as either examiners or supervisors. The expertise and experience of senior researchers in UoA24 has facilitated a supportive environment within which all staff can flourish; evidenced further by significant output contributions of ECRs (20% of outputs) and ESRs (25% of outputs) to this submission.

Since REF2014, the development of strategic relationships with external partners via research agreements (i.e., Hull City Tigers AFC, AFC Bournemouth, England Rugby Football Union), funded projects (i.e., Castleford Tigers RLFC, Rugby Football League), consultancies and probono alliances have been realised. Such collaborations align to our vision of co-creating knowledge with collaborators and have been fundamental to enhancing the capacity of the Unit to engage and impact positively with those outside of academia (illustrated in the impact case studies). Furthermore, staff from UoA24 (Barwood, Russell) have been pivotal in establishing continued university-wide investment in research funds that seek to smooth the transition from reliance on internally funded studentships to a more sustainable model of externally funded programmes of research study (i.e., co-funded research studentship scheme, with the institutions only ever co-funded PhD studentship being recruited to in UOA24 during this audit period). Additionally, to facilitate impact, all research and KE bids submitted for internal funding support via various schemes (i.e., research development fund, KE fund) are to be accompanied by a specific impact strategy. Significant contributions to research and impact activities have been recognised through promotion. Notably, Russell was promoted to Professor of Performance Nutrition and Applied Exercise Physiology in 2018 and then appointed as Interim Institutional Co-Lead for Research and KE in June 2020.

#### Research students

Developing a larger and more diverse PGR student community was a key component of the Unit's research strategy given that it had awarded zero research doctoral degrees, had no full-time, and two part-time research students enrolled at the REF2014 census date. UoA24 has experienced significant and sustained growth during the current REF census period with 11 PGR students (by headcount) having either completed or continuing to work towards completion of their doctoral programmes since 2013/14. This results partly from UoA24 staff winning £250,000 worth of competitively funded LTU studentships (including Graduate Teaching Assistant stipends) and supporting fee-waiver studentships for undergraduate students of distinction, since 2013/14. Notably, a key contributor to our recruitment growth has come from the five self-funded PGR students occupying professional practitioner roles (i.e., AFC Bournemouth, England Football Association, England Rugby Football Union) who wish to study under the supervision of the Unit's staff members (Arjomandkhah, Barwood, Davis, Russell); a further indicator of our developing research culture, and aligning to the Unit's impact and KE agendas. Encouraging Unit staff to keep external website profiles updated with indicative research projects, and specifically stating that they are open to self-funded students has helped to raise awareness of our ongoing PGR, research, and impact activities. Likewise, the Unit aligns to the policy that neither a member of staff nor a Department will be charged course fees for its staff registering on higher degrees provided by LTU. Successfully securing our first co-funded research studentship was a notable milestone in the current REF census period. The tripartite agreement between a sporting governing body (i.e., The Rugby Football League: £15,000), professional sports team (i.e., Castleford Tigers RLFC: £15,000) and LTU for a PhD studentship (supervised by Davis and



**Russell**), reflects a key aim of our impact strategy by working in partnership with beneficiaries and stakeholders.

We develop students with an in-depth knowledge of their topic and the broader context within which their research is placed. High quality training in research methodology provided by the Unit's supervisory staff, LTU's central resources, and ad hoc support as necessary allow for tailored training via the live training plan document required for each PGR student. To ensure suitability for PGR study, all of the Unit's applicants are interviewed by a panel including supervisory team members and the Director of PGR (**Barwood** or nominated deputy). Thereafter, following ratification by the University of Leeds as accrediting partner, the PGR receives a structured induction process – including research ethics and integrity training (see section 1). All of the Unit's full time PhD students are provided with a laptop computer at the beginning of their studies configured with the software appropriate for their specific work requirements.

The Unit endorses and implements the requirements of PGR supervision outlined by the research degree handbook. Where necessary, discretionary central funds are used each year to help research students attend conferences, purchase project-specific consumables, or to support those towards the end of their projects who require (due to unforeseen circumstances, such as COVID-19) short extensions of funding to write-up. A purpose-designed research office provides work and computing space for up to 16 postgraduates and post-doctoral researchers. A supportive postgraduate environment (including dedicated facilities, formal monitoring, discipline specific training and conference/travel support) is evidenced by PRES2020 data where 80% of the Unit's respondents agreed that they were confident of submission within the registration periods defined by the University of Leeds.

The Unit has contributed to 2.5 doctoral degree awards over the census period (including multidisciplinary supervisions between UoA4 and 24), and current registration (as of 31/7/20) of eight PGR students at doctoral level (FT: 38%, PT: 62%); with 66% of FT students in receipt of fully funded stipends/scholarships. Since academic year 2013/14, the Unit has also graduated five Masters by Research students. Notably, since the census cut-off date, the Unit has already exceeded the number of doctoral completions recorded in the last census period.

Much of the generic skill development training is provided centrally for our PGR students by the University Research and KE Office (URKEO) and includes provision from the accrediting partner University of Leeds, and online content from the University of East Anglia. The Unit embeds each PGR student within its two research themes, and they have daily interactions with other postgraduates, technical and academic staff both within and beyond the UoA. Our PGR students contribute significantly to the Unit's research output (including those outputs submitted, and underpinning the impact case studies), especially for ECR and ESR staff, and contribute critically to the feeling of energy and enthusiasm in our research environment. This is evidenced by PGR students often achieving significant recognition in their own right; for instance, most PGR students have published articles in peer-reviewed journals (i.e., Aben, Beaumont, Curtis, Haluch, Hills, Hudson, *St-Quinton*, White) and have presented widely at National/International conferences (i.e., Aben: BASES Student Conference 2019, Beaumont: UK Congress on Obesity, Curtis: International Sports and Exercise Nutrition Conference 2018, Hills: World Congress on Science and Football 2019) prior to their thesis submission. 100% of respondents to PRES 2020 agreed with having: "*Presented a paper or poster at an academic research conference.*"

Agreements between LTU and International Universities have enabled the Unit's PGR students to spend time and work with esteemed collaborators. For instance, Hudson spent time at the Movement and Posture Analysis Laboratory at KU Leuven (Belgium) in order to further his research on the determinants of individual load carriage economy using specialist equipment (i.e., force instrumented treadmill). Similarly, Hills attended the Sports Performance, Recovery, Injury and New Technologies Research Centre at ACU to collaborate in wider team sport research, and to upskill in novel methods of statistical analyses; facilitating the incorporation of more advanced statistical methods into work within and beyond the research theme thereafter. Notably, five of the Unit's PhD students have secured lecturing positions at UK Universities and one is working as a practitioner in professional sport. Additionally, in PRES 2020, the Unit was scored at 90% or above for supervision (90%), research skills (95%), and development skills (90%).



# Equality and Diversity

As per LTU's Code of Practice, all staff involved in the Unit's decision making for REF2021 have completed REF-specific Equality, Diversity and Inclusion training. Data comparing the gender, age, nationality, marital status, disability, sexual orientation, religion, and ethnicity between the 8 staff eligible for return relative to the wider UoA are presented in Figure 1 (panels A-H, respectively). In 19 out of 23 comparisons, there was less than or equal to an 18% within-variable difference between groups. The remaining comparisons differed by 22% for individuals aged 31-40 (UoA24: 53%, REF eligible: 75%), 24% for respondents answering not disabled (UoA24: 100%, REF eligible: 76%), and 26% for declaring no religion (UoA24: 24%, REF eligible: 50%). Note that close to 6% represents one member of staff.





**Figure 1:** Gender (panel A), age (years; panel B), nationality (panel C), marital status (panel D), disability (panel E), sexual orientation (panel F), religion (panel G), and ethnicity (panel H) comparisons between the UoA24 total staff cohort and the 8 REF-eligible staff returning outputs in the Unit.

The Unit supports LTU's ambitions stated in the People Plan 2018-2021 to recognise the link between the wellbeing of our staff and students and our overall success. Accordingly, resources are provided to encourage and inspire our people to pay attention to their health and wellbeing. Notably, across the University, ~10% of employees are trained and accredited Mental Health First Aiders. Within UoA24, there are three dedicated Mental Health First Aiders (**Davis**, GRACE, MCDONALD). Furthermore, the Unit encourages LTU's use of the Employee Assistance Programme. As part of the Mindful Employer network, LTU is also a signatory to the Charter for Employers who are Positive about Mental Health facilitating stress management workshops or wellbeing sessions, timely access and local support for staff during sickness absences, training for managers to tackle mental health issues as they arise and sharing of best practice between local businesses when working to minimise the impact of mental ill health at work.

# 3. Income, infrastructure and facilities

The Unit's strategy for generating grant income in the assessment period was founded upon the recruitment of high performing staff within the fields aligned to our submission, coupled with our sustained encouragement of collaborative and interdisciplinary working. Income against all research council, charity, European Union, industry and government funded research has totalled £93,000 across the current REF cycle. Notably, <u>Cooke</u> was awarded £46,000 from Public Health England in support of research with the Royal British Legion's Battleback Centre at Lilleshall. While modest, successes with key industrial partners have been realised. Notably, **Russell** secured £30,000 from Castleford Tigers RLFC and Rugby Football League for the Unit's first externally co-funded research studentship. This partnership has proven beneficial from a number of perspectives that align to our strategic aims, notably affording other UoA24 staff to contribute to the supervision (**Davis**) and internal examination (**Radcliffe**) of such work. Furthermore, due to its success, such funding arrangements have been formalised by **Russell** and forms the basis of an institution-wide model to support co-funded research degree studentships moving forwards.



These contributions are likely to enhance the success of future income generation both within and beyond the UoA via collaborative means post REF2021.

Following an internal competitive process to allocate additional QR Strategic Priorities Fund funding, **Barwood** won £30,500 for the Unit to provide a research evidence base to change policy and lower UK drowning incidents; an award that facilitated international collaboration with the University of Canterbury, New Zealand. Other notable funders for this body of work include the Great Britain Sasakawa foundation for international collaboration with Hokkaido University, Japan (£3,000: **Barwood**).

External income generation is an area of strategic priority moving forwards and has featured in the UoA, School and LTU's research and KE strategies. Directly linked with the substantial rise in the diversity of funding sources, has been a significant increase in the number of submissions made to a broad range of external funding agencies. Moving forwards, mobilising interdisciplinary teams around particular funding calls and primarily focusing on small grant capture to develop track-records of success, is anticipated to develop significant capacity that enables us to align with both formal and informal funding programmes. Invariably these opportunities may also demand contributions from colleagues outside of UoA24 and in some cases, LTU.

At a Unit-level, researchers contribute to shaping research infrastructure and resources through meetings, annual away days and strategic research review events. Via <u>Cooke</u>, **Barwood**, and **Russell**, the Unit also has named expertise and representation on LTU's senior Research and Knowledge Exchange Committee (RKEC). Additionally, research and impact advice, support and guidance are provided to the Unit by the URKEO; a central resource that has been heavily influenced by UoA24 staff via named roles (i.e., **Barwood**: Director of PGR, 2017 onwards), <u>Cooke</u> (University lead for Research and KE, 2016-2020) and **Russell** (Chair of LTU's Research Ethics and Integrity Committee, Interim co-lead for Research and KE, 2020 onwards). Staff in the URKEO have specific responsibilities to advise on all aspects of research and KE activities, including funding and to provide training and advice on funding availability and grant capture.

The Unit has invested in its infrastructure, both in terms of creating new space for, and improving existing, research facilities. Research facilities for UoA24 have been consolidated into a bespoke sports building that incorporates specialist laboratories which have teaching and learning, research, KE, and impact uses. The Unit provides an environment for the transfer of knowledge from applied human studies to external stakeholders by its specialist laboratories. The Unit has capacity to conduct research into physiology, nutrition, sports therapy, applied performance testing, biomechanics, and body composition. The Human Performance facility comprises a dedicated strength and conditioning laboratory, exercise physiology laboratories, biomechanics suite and sports therapy clinic. Specialist equipment purchased during the current census period includes Kistler force plates, micro-electromechanical and 3D motion analysis systems, electromyography, deep-body temperature assessment devices, thermal monitoring systems, transcranial direct current stimulation devices, automated eye tracking equipment, cardiopulmonary exercise testing with breath-by-breath determination of gas exchange and ventilation, near-infrared spectroscopy for tissue oxygenation, blood gas, electrolyte and acidbase blood analysis, a range of blood lactate analysis equipment, a range of ergometry equipment including Lode Excalibur Sport electromagnetically-braked cycle ergometers. Organisation of access to, and training on, the facilities and major equipment items are organised by specific members of the academic and technical staff to disseminate best technical practice throughout the Unit, School and LTU more widely. This includes the commissioning of new equipment and software and the training and sign off for PGR students as well as staff. A full-time technician is available to support research activities in SHAPE and to oversee the revised health and safety processes commensurate with the Unit's activities.

All of these facilities are in close proximity to each other and contain laboratory and office space that enables and promotes collaborations and facility sharing. This building is physically embedded within the Sports Centre which is open to the general public and helps to facilitate KE via Trinity Performance. Collaboration agreements exist to offset the cost for using such facilities when linked to research and KE activities, with the outputs generated since its introduction (including those submitted to REF2021) benefitting significantly. Moreover, the Unit has a flexible



annually reviewed policy with regards to the priorities for acquisition of equipment and associated key resources required for the development of its research strategy, with investment at LTU, School and Department level. In addition to access to University of Leeds resources (as validating institution for PGR degrees), we also have excellent central library and IT facilities with UoA24 holdings including electronic access to a wide range of journals and specialist qualitative and quantitative data analysis software that support our research themes (e.g., Nutritics).

### 4. Collaboration and contribution to the research base, economy and society

Working with researchers embedded in external academic institutions and/or professional organisations supports our impact and KE strategy and allows smart and resource-efficient partnership working in common areas of interest. Furthermore, the Unit's international collaborations have enhanced the reputation of LTU, which in turn can attract increased inward investment. Academic staff from UoA24 have established collaborations and a global network of academic partners as demonstrated by co-authored published papers and abstracts and/or joint grants submitted in the current cycle. The Unit's staff collaborate with academics from multiple locations within Australia, France, New Zealand, Poland, Spain, and USA to name a few. Notably, our agreement with ACU has facilitated a two-way exchange of research staff and PGR students associated with hosting the Sports Science Summit at LTU in 2018 and 2019. This project involved collaborative delivery of an MSc in High Performance Sport that had a focus on applied research across three International locations (Australia, England, USA), with LTU being the sole UK partner.

Staff also collaborate with colleagues from over 10 institutions throughout the UK; a statement exemplified by the number of external co-authors contributing to our submitted outputs. Notably, collaborative working with Professor Liam Kilduff at Swansea University has aided the publication of >30 outputs akin to elite sports performance over the current census period that involve both UoA24 staff and PGR students. Collaborations with experts in environmental physiology (i.e., Professor Mike Tipton and Dr Jo Corbett; University of Portsmouth) and neuromuscular physiology (Dr Stuart Goodall, Northumbria University) has produced a further 30 published outputs collaboratively over the census period.

Practically, a number of procedures support collaborative working at Unit, School and LTU levels; for instance, providing that the Unit's staff member is specifically named on the submission, to avoid duplication, the LTU researcher can log ethical approval documents approved by another Institution or Organisation to the School's Research Ethics Committee to facilitate a 'light touch' internal review. Similarly, Visiting Professorships also enhance the depth and range of expertise available to our Unit's staff and PGR students. Professor Shawn Arent (University of South Carolina, USA) is a Visiting Professor at LTU who has strengthened the Unit's expertise in applied sports science support, helping to widen the reach of our impact to international audiences via his work in the USA's National Collegiate Athletic Association Committee on Competitive Safeguards and Medical Aspects of Sports.

To encourage impact and end-user application, UoA24 fosters a community-engaged, actionoriented research approach that involves those affected by the issues being studied. UoA24 staff have established collaborations with various industrial partners, the third sector and other users of research; demonstrating our ethos of working alongside specialist communities and practitioners to facilitate a vibrant insight and an opportunity to exchange and share knowledge to create drivers for change. Notable examples of this that fall outside of the impact case studies submitted include:

- Arjomandkhah's research has investigated substrate metabolism during exercise, predominantly with the use of stable isotope techniques. Such work led to collaborative working with the Ministry of Defence to better understand responses to hypoxic environment exposure in both sports performance and clinical contexts.
- <u>Cooke's</u> research consultation with Leeds Beckett University on the Whole Systems Approach to obesity contributed to addressing the challenges of obesity across England through work with Public Health England and Local Authorities (LAs). This collaborative project has also been cited by Public Health England in a) Physical Activity - prevention and management of long-term conditions, b) Community-centred public health: taking a



whole system approach, c) Using the planning system to promote healthy weight environments, and d) Childhood obesity trailblazer programme, signaling the significance of the work across public health to PHE, not just in obesity.

- **Davis'** research informs cerebrovascular (i.e., brain and cardiovascular system) function across a range of population groups. The focus of the research assesses the cerebrovascular function during a range of everyday life stressors and the neuroprotective benefits that exercise, and age can pose.
- <u>Hobbs</u> focused his research on geospatial and population health methods to inform local and national public health policies when planning healthy places to reduce health inequities. He conducts research in the areas of: a) physical activity and sport; b) geospatial and population health; and c) social and cultural inequity.
- **Radcliffe's** recent work has explored the complexities of applied practice when working in applied sport psychology with a view to informing the education and accreditation pathways of practitioners.
- Sellars' recent research has focused on leadership in sport and the effectiveness of monitoring and evaluating in sport provision. Both areas of research have been undertaken in collaboration with a range of external partners such as The British Judo Association (Paralympic Team) and GB Wheelchair Basketball and, Sport4Life charity.

Acknowledging that impact is only part of the Unit and LTU's mission and vision, and that it often takes time for impact to develop – often happening by a combination of organic and planned activities, relationships with external stakeholders need to be both developed and maintained. Pathways to impact have primarily involved:

- 1) Engaging stakeholders and beneficiaries (before, during and after projects),
- 2) Working with partners,
- 3) Influencing policy,
- 4) Communications,
- 5) Public engagement.

These partnerships have enriched the research environment via (i) the provision of direct support (i.e., funding for staff, research students and consumables), (ii) the commitment of non-LTU staff to join research teams/groups to shape the research agenda, (iii) the hosting of university staff and research students within their organisations for extended periods (up to 6 months) and (iv) the co-ordination of jointly sponsored workshops and other events. These partnerships are also reciprocal, and staff have taken various positions within external organisations ranging from advisory roles to paid consultancies.

Outside of collaborating partners, practitioners have benefitted from LTU's research. Sharing data at numerous invited presentations at key practitioner events nationally and internationally (e.g., United Kingdom Strength and Conditioning Association annual conference, Sports Science Summit, International Society of Sports Nutrition Expert workshops, American College of Sports Medicine annual conference) and has been specifically targeted to provide consultancies which draw upon the research cited. Since 2017, **Russell** has delivered practitioner education workshops to the staff of international (i.e., English Football Association, England Rugby Football Union, England Rugby League, Scottish Rugby Football Union, DC United and Houston Dynamo; USA) and domestic (i.e., AFC Bournemouth, Chelsea FC, Barnsley FC) sports teams. In addition to the beneficiaries identified previously, nearly 900,000 people from all over the World have interacted directly with the research underpinning our two impact case studies (according to Altmetric data).

Our Unit integrates research and consultancies with a number of elite sporting organisations that compete on the world stage, and health-based authoritative bodies working towards a better understanding of global health issues; organisations which both require input from world-leading scientists to help achieve their aims. Indeed, outputs from the Unit's staff are co-produced with industrial partners; for example, authors from partnering organisations (i.e., AFC Bournemouth, Hull City AFC, Newcastle United FC, Castleford Tigers RLFC, The Rugby Football League, PlayerMaker, and the Royal Society for the Prevention of Accidents) have all been named on the



Unit's outputs. Collectively, these sustained and fruitful relationships are an essential aspect of a vibrant applied research environment that allows OA to professional athletes, patients, and participants of all ages.

UoA24 staff contribute to communities in terms of knowledge, understanding, application, policy and informing professional practice. In the Enhancing Human Performance research theme, **Russell's** research informs the practices of elite rugby and soccer players competing for top tier domestic and international-standard teams. Key performance indicators have been improved by discontinuing sub-optimal practices, and modifying the recommendations made to players concerning their match-day preparation and recovery strategies. Accordingly, **Russell's** research has contributed directly to changes in the practices of professional sports teams and informs international expert statements (see submitted impact case study). The pathway to impact has primarily been through partnership working by influencing practitioners who deliver professional services and embed the research into athletes' competitive routines. Similarly, **Barwood's** work considers the safe and effective administration of the perceptual cooling intervention of L-Menthol to enhance performance in the heat. Initially applied to elite sport, this work has now been recognised and expanded by internationally recognised research groups into clinical populations (see submitted impact case study).

In the Health and Wellbeing across the Lifespan research theme, **Barwood's** research has informed the evidence base underpinning safety behaviour to maximise the chances of survival for those who accidentally fall into (cold) water. More recently this work has focussed upon the environmental risk factors that contribute to the risk of drowning including the variation of these risk factors across age groups. This work will inform the evidence base underpinning the UK Drowning Prevention Strategy. **Barwood's** work is interdisciplinary including contributions from researchers, practitioners, clinical research groups and stakeholders. As part of the wider focus of the Health and Wellbeing across the Lifespan research theme, **Davis'** research has established the neuroprotective effects of exercise on cerebrovascular function in young and older adults. Moreover, it has also demonstrated the benefits of dietary antioxidants in this context.

The Unit's staff members have made important contributions when serving as guest editors (i.e., Nutrients, Frontiers in Sports and Active Living; **Russell**) and contributors for a number of academic and professional journals (i.e., **Arjomandkhah, Barwood**, <u>Cooke</u>, **Davis**, <u>Hobbs</u>, **Lloyd**, MCDONALD, **Radcliffe**, **Rowley**, **Russell**, **Sellars**). Staff have contributed book chapters (**Russell**) and co-authored (**Russell**: International Society of Sports Nutrition Position Stand: Nutritional Considerations for Single-Stage Ultra-Marathon Training and Racing) and convened (**Barwood**: Menthol as an Ergogenic Aid for the Tokyo 2021 Olympic Games: An Expert-Led Consensus Statement Using the Modified Delphi Method), position stands and authoritative statements. Substantial contributions to the peer review process by conducting over 300 verified manuscript reviews for more than 35 journals has occurred:

(Barwood: https://publons.com/researcher/2904342/martin-barwood/,

Rowley: https://publons.com/researcher/3009060/chris-rowley/,

Russell: https://publons.com/researcher/1730156/mark-russell/).

UoA24 staff also serve on grant review (i.e., Multiple Sclerosis Society: **Barwood**, Stroke Association: **Arjomandkhah**) and accreditation (i.e., BASES; **Radcliffe**) panels.

Unit staff have led international conference organising committees; for instance **Russell** has Chaired the Football Analytics and Performance Evaluation Summit (Munich; 2016), the Team Sport Research Symposium (Leeds; 2017) and two iterations of the Europe arm of the Sports Science Summit (Leeds; 2018, 2019). Similarly, **Barwood** convened a symposium session on the uses of Menthol in the heat at the International Conference on Environmental Ergonomics (ICEE) for 2019 (Amsterdam) before being elected as Chair of the organising committee for future ICEE events. UoA24's research has been disseminated by staff members via invited presentations at the annual meetings of: American College of Sports Medicine (**Russell**), International Society of Sports Nutrition (**Russell**), UK Strength and Conditioning Association (**Russell**), Gatorade Sports Science Institute Mexico (**Russell**), ACU High Performance Sport Summer Seminar Australia (**Russell**), and ICEE (**Barwood**). Between them, **Russell** and **Barwood** have delivered more than 50 invited conference talks, workshops, and seminars.



Professional organisations or learned societies benefit from UoA24 staff serving in leadership positions (i.e., Russell: National Performance Director; UK Deaf Sport, Scientific Advisory Committee member; Rugby Football League, Leeds Academic Health Partnership; Leeds Clinical Senate Executive Group, Sellars: Leeds One Workforce Strategic Board and Sport Leeds Operations Group member, Gannon: Education/Technical Director at Welsh Gymnastics), mentoring posts (i.e., Radcliffe: BASES supervised experience supervisor and reviewer, Russell: PubLons mentor), academic (Sellars: Member of the BASES Heads of Department Forum) and applied roles (i.e., Russell: Consultant Sports Scientist). Likewise, research consultancies (i.e., Cooke: Leeds Beckett University, separately for work with Public Health England on a Whole Systems Approach to obesity and the Royal British Legion for military wounded, injured and sick serving personnel), contributions to external postgraduate courses (i.e., Russell: ACU Masters of High Performance Sport, Football Science Institute faculty member, International Society of Sports Nutrition tutor) and involvement in the delivery of a number of technical and skills-based training courses have been completed, including the International Society for Advancement of Kinanthropometry (ISAK) level one and two qualifications (led by Curtis and Russell). As well as facilitating internal examining opportunities for the Unit's ECR and ESR staff (i.e., Arjomandkhah, Davis, Radcliffe, Rowley), senior researchers in the Unit (i.e., Cooke, Barwood, Russell) have also contributed to the examination and progression assessments of more than 50 research students at a number of both UK (i.e., Teesside, Chester, Leeds Beckett, Swansea, St Mary's, Middlesex, LJMU, UCLAN, University of Leeds, Loughborough University, Chichester University) and international (i.e., Queensland University of Technology, La Trobe University, Brock University) Universities.