

Institution: Liverpool Hope University

Unit of Assessment: 26 - Sport and Exercise Sciences, Leisure and Tourism

a. Context

The research unit sought to impact upon four main areas:

- a. Impact on the care pathway for patients undergoing major surgery for cancer following chemotherapy (Dr Simon Marwood).
- b. Impact on youth team physiological monitoring and selection policy in professional football (Dr Denise Roche, Dr Kat Holloway, Dr Simon Marwood).
- c. Impact upon public discourse on Irish social identity (Dr Liam O'Callaghan)
- d. Impact upon perceptions of international sport-for-development and European football fandom and hooliganism (Dr Joel Rookwood)

For (a) this relates to on-going research investigating the role of aerobic fitness in surgical outcome following chemotherapy in cancer patients, with particular emphasis on upper gastro-intestinal cancer. Outcome can be measured most bluntly in terms of days of survival post-surgery, however low survival is also associated with a number of high-cost outcomes such as post-operative complications, unplanned critical care admissions, extended length of stay post-surgery and high use of critical care beds.

A better understanding of those factors which predispose certain individuals to have poor outcome following surgery would benefit society and reduce the cost to public health care systems. Furthermore there would be benefit to individual patients as intervention strategies could be conceived to mitigate such factors or identify those patients for whom surgery is the most risky option. In collaboration with the clinical team at University Hospital Aintree, we had patients who were scheduled for chemotherapy and surgery for the treatment of upper gastro-intestinal cancer undertake incremental (cardio-pulmonary) exercise testing for the determination of physical fitness (as measured by lactate threshold and maximal oxygen uptake). Our research demonstrated two things; (i) that chemotherapy resulted in a significant reduction in physical fitness and (ii) those with higher physical fitness had a better outcome following surgery

This research therefore identifies an important predictor of outcome following chemotherapy and major surgery and highlights the need for maximising physical fitness prior to and during the care pathway. The impact upon patients and on the healthcare system is therefore to consider ways to both monitor and maximise physical fitness when the care pathway endpoint is major surgery and one of the treatments is chemotherapy. The impact achieved here is a direct outcome of research into muscle oxidative metabolism, in this case applied to patients undergoing chemotherapy and major surgery for the treatment of cancer.

For (b) we undertook novel research into metabolic and cardiovascular fitness in adolescent footballers, identifying superior physical fitness, cardiovascular and metabolic function both at rest and during exercise in trained adolescents (versus age-matched controls), for both sexes. Our data showed that those players that were retained by the club had superior cardiovascular function at rest and during maximal exercise, largely as a function of body size. Beneficiaries of the impact would be the football club, who would be able to use the data to help set criteria for physical fitness, metabolic and cardiovascular functioning with respect to selection policy. Unfortunately, though we were permitted to view retention statistics for the male players, both professional clubs that we worked with declined further collaboration beyond these studies, hence it was difficult to assess the impact of the research within the football clubs' selection policies.

For (c) this relates to research on the social and cultural history of rugby football in Munster, Ireland. Dr O'Callaghan's research revised a number of popular beliefs regarding Munster's idealised image as a classless, egalitarian team with humble roots, finding instead that such a picture was illusory and a function of "myth-making" as commonly undertaken in sports teams. The impact of this research was widely spread, influencing public discourse regarding an institution of popular cultural acclaim (i.e. Munster Rugby) throughout Ireland and beyond; for example media interviews on Dublin's 98fm, RTE Radio's Sport at Seven, *The Irish Times* and *The Wall Street Journal*. Furthermore, the impact of this research has spread to hard to reach communities such as in County Cork on the periphery of South-West Ireland where it provoked dozens of comments

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on the popular 'People's Republic of Cork' blog – a very active discussion forum patronised by people living in this county.

For (d), this relates to Dr Rookwood's work on International Social Development and contemporary football hooliganism. For the former, this work has incorporated sport, aid and education-based programmes aimed at engaging with, empowering and enhancing the lives of the underprivileged, and those who have been the victim of racism, terrorism, disaster, warfare, crime, poverty, famine and persecution. Dr Rookwood's submitted work on Azerbaijan and Russia examines the definitional and theoretical challenges associated with framing responses to youth programming in post-conflict communities. This includes aspects such as the logistical, linguistic, cultural, political and religious concerns presented by sport-based Global North / Global South collaborative programming. Quantifying the impact of this collective work on individual lives is difficult, particularly given the extensive linguistic and socio-cultural variance across different political contexts. However, their value is attested to by the growing prevalence of these projects and the consistent level of engagement from leaders and members of the various splintered communities. Indeed, this work has directly impacted the approach of Teams4U, an organisation founded by the founder of Operations Christmas Child, to a conceptual and practical remodelling of the use of football in West African contexts for example. Dr Rookwood was also an invited author of an article for 'Football Perspectives' in September 2012, a website that features analyses of the issues affecting football, written by academics studying the game and people working within it. The site has proven very successful in providing a forum for research-based analysis to be presented in an accessible way to a wide audience beyond the academic community.

Dr Rookwood's work has also examined perspectives of English and European football disorder, focusing on the policing of fans, the legislative response, and the behaviour and attitude of supporters. His research has offered insights into how crowd disorder might be understood and controlled and has impacted greatly on public discourse on a truly global issue. In November 2009, Dr Rookwood was interviewed for a Sky Italia documentary entitled 'Un altro giorno di gloria' ('another day of glory'), which gave voice to academic and popular examinations of European football rivalries. Dr Rookwood's research has also featured many times in several iconic football fan publications, including The End and Boss and he has been interviewed for El Punt newspaper in Vic, Catalonia and for La Vanguardia newspaper (circulation of approximately 200,000) on the relationship between alcohol and disorder in football. These key examples demonstrate that Dr Rookwood's research into football fan culture has a widespread applicability and reach outside of the academic community.

b. Approach to impact

A key source of research impact is that which can impact upon public health. Our approach was therefore to make direct contact with clinicians at University Hospital Aintree in order to gain access to patient groups of interest and bring together specialist knowledge in muscle metabolism with clinical expertise. The aim was to understand better the disease process and its relationship with the treatment and exercise capacity in specific patient groups where we considered our expertise to be best placed. Key members of the surgical and multi-disciplinary team were aware of the research from the outset such that early findings could have immediate impact. The outcomes of this approach were research outputs and research impact as identified in the case studies.

Research into the metabolic and cardiovascular responses to exercise in trained adolescents (male and female) was undertaken utilising players from the Youth programmes of professional football clubs. Direct contact was made to the Youth Team managers of identified clubs in the locality. Our intention here was to provide baseline, indicative data of the expected physiological profile of players of this age and promote a long-term relationship whereby the results of our research would help inform on issues such as player selection and player retention in youth football programmes in professional football.

In terms of the social sciences of the unit, one approach has been to select research areas of mass popular appeal, such as rugby in Munster, the outcome of which is then likely to generate much social discourse and impact entire communities who identify with the phenomenon of research interest. Another has been to undertake research into sport development in conflict

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zones; if applied successfully elsewhere to bring about peace in communities this would be of significant impact, albeit difficult to measure.

The unit was able to support achievement of impact by enabling time away from campus (through cover for necessary institutional activities) and sourcing funding from central University funds to support travel and subsistence both to scientific conferences and for face-to-face meetings with partners in the collaboration.

c. Strategy and plans

The unit's strategy and plans for the future feed into and sit within a developing institutional strategy which will embed impact within academic life and culture. In terms of the unit's research environment:

1. Impact will form a part of annual performance review. This will include target-setting and identification of any staff development needs.
2. Impact achievement and potential will be one of the criteria to be considered in recruitment and promotion processes.
3. A portion of research funds, at unit level and institutionally, will be earmarked to support impact-related activity.
4. Regular review mechanisms for on-going projects will be established, to measure progress and effectiveness and assist with forward planning.
5. Staff development in impact for the unit will continue, to optimise the effectiveness of impact-related activity and support individuals/groups at all stages of the impact life-cycle.

The unit still considers clinical populations to be an important for impact in research, thus our future strategy will be to develop the research collaboration with the clinical team at University Hospital Aintree. Our strategy is to undertake relevant (and currently unstudied) research in healthy individuals in order to develop optimised strategies for enhancing aerobic fitness in clinical populations with major surgery as a treatment endpoint. The strong staff expertise in the remit of exercise and cardiovascular physiology within the unit coupled with significant investments in (cardio)-vascular assessment equipment will underpin the continued future focus within this area.

In relation to the Social Science research strand, the future direction of research will focus on critical and analytical research with a view to gaining greater insights into football-related issues that have a direct social importance through their impact on the personal and collective welfare of fans. These include policing, collective identities, racism, the interpretation of English football disasters and the currently under-researched area pertaining to the establishment, sustainability and legitimacy of splinter football clubs in European football.

Mega events have become an increasingly significant component of international sporting culture. To that end, future research engagement into global sports tourism and the internationalisation of sports fandom, focusing on the English Premier League, European club competition and international tournaments will be a key target. This latter area will particularly involve critically examining the bidding process of competitions such as the FIFA World Cup, as well as the hosting, control and policing of international sports spectators. In the context of the growing field of international sport-for-development, the long-term plan is to engage in evaluative work, focusing on projects implemented by non-governmental-organisations and universities in the Global South. Political contexts will include Sierra León and Zambia, and developmental contexts will include sport, international aid and health promotion.

d. Relationship to case studies

Case study 1 exemplifies the approach to impact whereby direct measurements of aerobic fitness were taken before and after chemotherapy and patients followed up following surgery. A direct link was formed between aerobic fitness and survival, indicating the importance of aerobic fitness in improving outcome from surgery. The impact this had on the care pathway for such patients is described.

Case study 2 describes a specific example of research impact in the social sciences, where an important social and cultural identity (Rigby in Munster, Ireland) was researched and overturned a number of myths surrounding the origins of the team. This shift in thinking regarding the roots of the team provoked significant discourse in Ireland and internationally.