

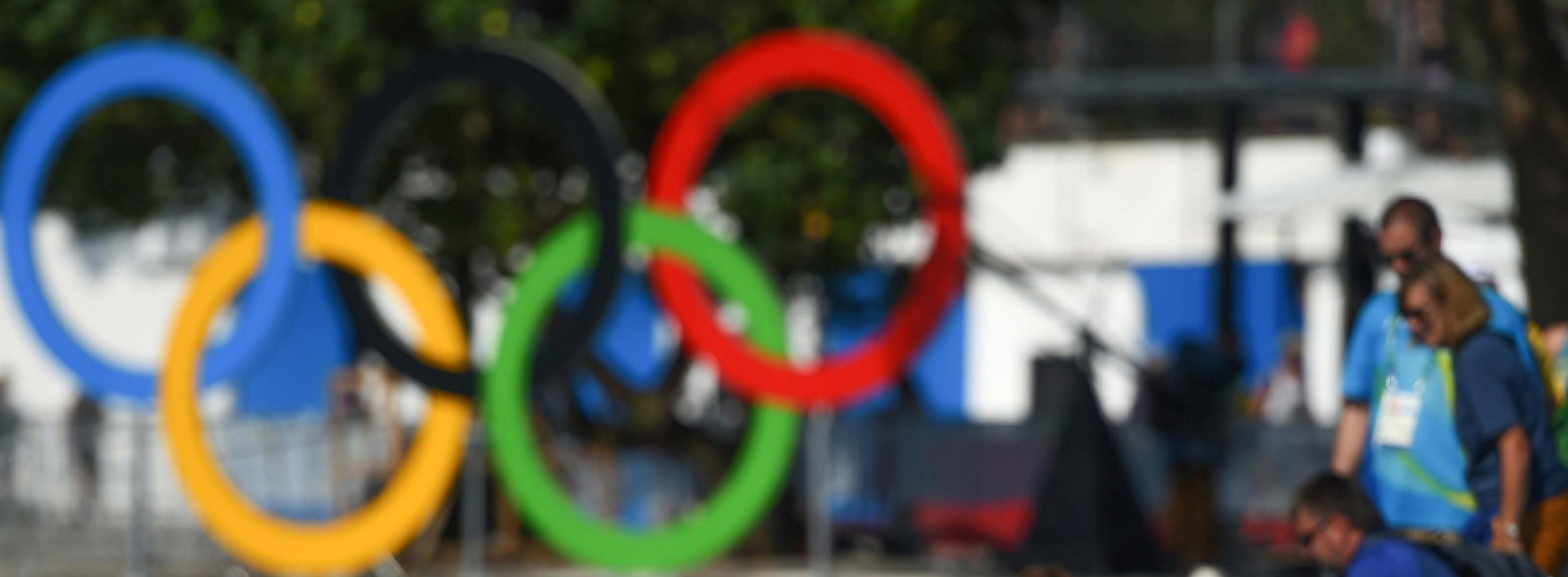


SPÓRT
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SPORT
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INSTITUTE

Annual Review

2017



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Olympic Rower Sanita Puspure, with Head of Rehabilitation, Sarah- Jane McDonnell, in Rio 2016

1.0 CEO Foreword

The Sport Ireland Institute has completed its first full calendar year since the High Performance Training Centre became fully operational in April 2016. The extension has brought many benefits to the High Performance sports with the level of cross-sport and disciplinary knowledge sharing a key feature of the environment now in existence. It is particularly noteworthy that the athletes and performance support personnel teams are voting with their feet marking a 64% increase year on year in the number of athlete service appointments at the Sport Ireland Institute. Our continued commitment to support the high performance sports with professional services at important training camps and competitions is also evident from the 211 days service overseas directly supporting Ireland's elite athletes.

The Sport Ireland Institute continues to evolve and is responding to the demands of the performance leadership of the high performance sports within the resource constraints which we all operate. The principle of partnership working is critical to the continued growth of the Sport Ireland Institute and the effective deployment of the resources available. We hope in the short term to provide greater levels of support to the high performance sports by extending our services further down the athlete pathway, particularly the junior and development squads. A first but significant step is the recent extension of the Sport Ireland Institute standard opening hours to include evenings and Saturdays and in doing so easing the cost burden on the sports.

The Sport Ireland Institute is a key piece in the high performance system and continues to grow and create innovative support initiatives to athletes and sports. I welcome the greater system alignment with the Olympic Council of Ireland and particularly the first time the Sport Ireland Institute provided support to Team Ireland at the European Youth Olympic Festival and the Winter Olympic Games. This greater alignment will have a positive impact on the athletes in their preparations and readiness for Tokyo 2020.

I'm proud of the key support role the Sport Ireland Institute plays for Irish sport and look forward to overseeing its continued growth. I'd like to thank the team for their continued professionalism, passion and their commitment to excellence in service delivery to Irish high performance sports.

John Treacy
CEO, Sport Ireland

2.0 Director's Report

On behalf of the Sport Ireland Institute team I'm pleased to present the Annual Review for 2017. This report outlines the extent of work carried out by our team in support of Ireland's high performance sports in a year of transition for the system in Ireland.

With a large turnover of CEO's, Performance Directors and coaches post Rio 2016, new relationships have been carefully built in order to forge ahead to the Tokyo 2020 Olympic and Paralympic Games. The new wave of high performance professionals working in Irish support has brought a significant increase in demand for the various supports on offer from the Sport Ireland Institute. At all times, we have done our utmost to respond to those demands. It is however essential that in attempting to increase support to sports without an increase in budget, the quality of the support provision is not compromised. Consequently, our resources are increasingly prioritising those sports that are likely to deliver success at Tokyo 2020.

We aim to be an essential partner for Irish sports in their success at European, World and Olympic/Paralympic level. The new Head of Performance Support (HOPS) roles currently being rolled out provides a greater level of partnership and an understanding of needs between the sports and the Sport Ireland Institute. A further example of our adaptability to the demands of the sports we support is the extension of our standard opening hours at evenings and on Saturdays. This provides a financial saving to sports performance programmes as well as allowing sports to use the services and facilities available at the Sport Ireland Institute for greater numbers of their athletes, particularly those at the early stages of their athletic development.

This report will outline an increase in services provided, footfall into the building and identify the allocation of the Sport Ireland Institute resources across the various direct service disciplines on offer. In addition it will outline the highlights of each service area as well as the support programmes now being offered to different peer networks operating within the system.

2017 marked the first year of the Tokyo 2020 cycle, but also the first full year of operation of the High Performance Training Centre. The number of athletes using the centre has grown accordingly, as well as the number of sports seeking access to the facilities available. We continue to work with the performance leadership of the sports to identify carded athletes whom are entitled to Sport Ireland Institute support, but also the athletes who qualify for support under the Performance Support Partnership Agreement between the sports and the Sport Ireland Institute. We aim to continue this upward trajectory.

The upcoming publication of the Sport Ireland strategy will be complemented by a unit strategy for the Institute which will layout our strategic priorities for the coming years to Paris 2024. This represents an exciting time in the evolution of the Sport Ireland Institute.

Finally, I would like to express my sincere thanks to all stakeholders of the Sport Ireland Institute who have contributed to our growth, development and success. We look forward to continuing our partnership with the NGBs, CEO's, Performance Directors, coaches, performance support personnel and of course, the athletes. In particular I'd like to acknowledge our own team at the Sport Ireland Institute for their commitment, dedication and collaboration for the betterment of high performance sport in Ireland.

Liam Harbison
Director, Sport Ireland Institute



3.0 Purpose of the Sport Ireland Institute

The Sport Ireland Institute was established to create an environment which influences, supports and ensures that talented Irish athletes will achieve sustained levels of excellence in elite sport. Sport Ireland Institute coordinates a network of highly experienced, quality assured service providers to help support this high performance environment ensuring that sports have access to the sports science and medicine supports that they need.

The Sport Ireland Institute works directly with NGBs in developing sports specific science and medical support networks so that each sport has the support it needs to impact on performance. The Sport Ireland Institute also works closely with service providers in developing systems, structures and protocols to ensure that athletes and sports receive the best support possible.

4.0 Background to the Sport Ireland Institute

Under the Sport Ireland Act (2015) Sports Ireland’s functions which are delivered in whole or in part by the Sport Ireland Institute are as follows:

- to encourage the promotion, development and co-ordination of, and the achievement of excellence in, competitive sport;
- to support elite athletes in achieving excellence in sport;
- to disseminate information concerning competitive sport or recreational sport

The Irish Institute of Sport which preceded the Sport Ireland Institute was established in 2007. In the intervening years this unit of Sport Ireland has grown incrementally to a budget of €2.18m in 2017, is now situated at the heart of the Sport Ireland National Sports Campus, and incorporates the High Performance Training Centre which has become the dedicated training base for a number of Irish high performance sports.

5.0 2017 Highlights

5.1 Support Sports

The Sport Ireland Institute supported athletes from 18 high performance sports. This support is delivered at a number of locations around Ireland and internationally. Two case examples (Boxing and Swimming) are outlined below that illustrate the close partnerships that have evolved between the sports and these Sport Ireland Institute.



Liam Harbison, Director Sport Ireland Institute (Left), John Tracey, CEO Sport Ireland (Middle), Fergal Carruth, CEO IABA (Right).

5.1.1 Boxing

2017 marked the completion of a partnership agreement between the Sport Ireland Institute and the Irish Athletic Boxing Association (IABA) to provide support and a world class training environment for the IABA High Performance Programme.

Sport Ireland is committed to supporting the IABA achieve its performance goals. To this end, the Boxing facility at the Sport Ireland Institute High Performance Training Centre was designed to the specifications detailed by the IABA. In combination with the other areas of the High Performance Training Centre (S&C, Mixed zone, Track, Medicine and Rehab, Physiology lab, Changing Village, Social Ecology and Performance Kitchen) the Sport Ireland Institute aim to work with the IABA to create an environment that fosters excellence, supports integrated and multi-disciplinary coaching, sport science and sports medicine practice.

The agreement was completed in April 2017, following which the permanent move of the boxing high performance unit to the Sport Ireland National Sports Campus took place.

One of the highlights of the year was the hosting of a six nation training camp at the Sport Ireland Institute in May.

“Moving our High-Performance Unit into the Sport Ireland Institute has allowed us to access world class facilities. The impact that daily access to these facilities and it’s support staff has had on my programme has been immense. From our boxing gym, the athlete strength and conditioning area to the physio room and medical office it allows my team to have immediate access to a multitude of elite facilities and services which enables us to deliver a world class programme”

- Bernard Dunne, IABA High Performance Director

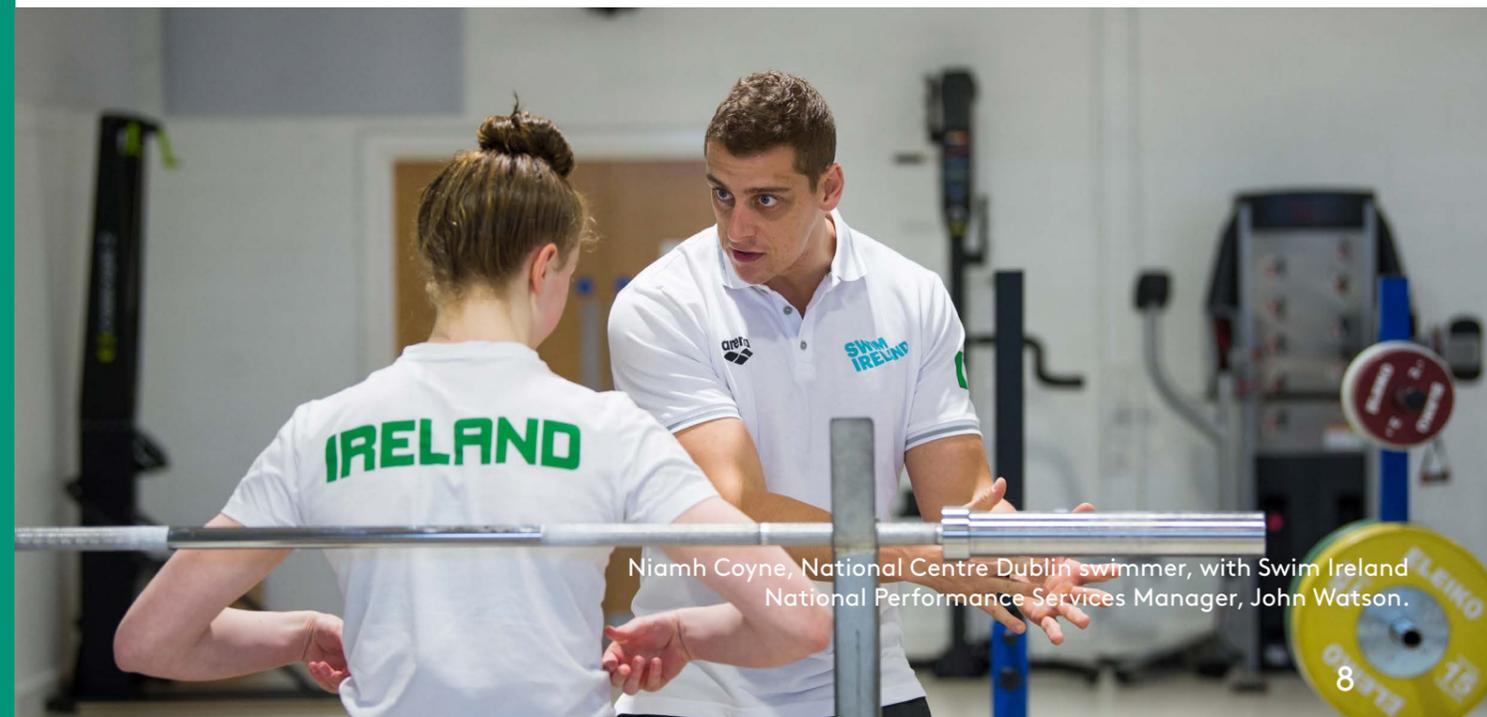
5.1.2 Swimming

Swim Ireland’s high performance programme has a strong presence at the Sport Ireland Institute and on the Sport Ireland National Sports Campus. A number of the swim athletes live on the Sport Ireland National Sports Campus, train at the National Aquatic Centre and receive support services at the Sport Ireland Institute. Highlights of the swimming support programme in 2017 include:

- Commissioning of an altitude facility in one of the on-campus swim houses to prepare athletes for altitude training whilst being able to closely monitor their physiological responses. The benefit of this is better understanding of the responsiveness of different athletes to the altitude stimulus and to manage training load and stress responses to ensure athletes stay fit to train.
- Full profile screening of swim athletes in the senior and pathway squads. Swim Ireland and the Sport Ireland Institute worked together to provide a full screen including: medical, cardiac, blood, respiratory, movement, anthropometry, body composition and stroke analysis. This programme was run by Swim Ireland, delivered by Swim Ireland and the Sport Ireland Institute team and part funded by us and Swim Ireland – a great example of partnership at work.

“Swim Ireland works with the Sport Ireland Institute to create a world-class performance environment for swim athletes. Our developing partnership delivers expert science, medicine and lifeskills support services under one roof in a top class facility. The Sport Ireland Institute is an integral part of swimming’s ambitions to put swimmers on podiums.”

- John Watson, National Performance Services Manager, Swim Ireland



Niamh Coyne, National Centre Dublin swimmer, with Swim Ireland National Performance Services Manager, John Watson.

5.2 Increased HPTC Usage

While the High Performance Training Centre at the Sport Ireland Institute was opened in early 2016, and became fully operational by April of that year, many of the target sports had their pre-Rio training plans in place and didn't heavily utilise the new facility. 2017 on the other hand, as the first year of the Olympic/Paralympic Games cycle, saw a significant increase in usage of the centre by 64%. More detailed usage statistics are available in section 7.0.

5.3 Organisation Developments

The management structure of the Sport Ireland Institute was reviewed in 2017 and a new streamlined structure of decision making and line management was created. Four clear departments have been established – Heads of Service Group, Heads of Performance Support Group, Capability & Expertise and Operations. These departments now report into the newly established Institute Management Advisory Group.

5.4 International Camp & Competition Support

Sport Ireland Institute conducts much of its work supporting athletes at International competitions and training camps. Section 14.1 lists the extent of supports provided per sport at such events in 2017.

The total number of service days provided by the Sport Ireland Institute Team at International competitions and training camps was 211.

5.5 HPX

On October 6th and 7th in the Sport Ireland National Indoor Arena, 350 delegates from 9 countries attended the 3rd HPX Conference which was coordinated by Sport Ireland Institute and Sport Ireland Coaching, with support from other Sport Ireland units. Over the two days, 20 sessions were delivered involving 63 speakers, including a large portion of the Sport Ireland Institute team.

98 delegates took part in a post event review process which has identified a series of key recommendations designed to enhance the next HPX conference scheduled to take place in late 2019.

5.6 Strengthened Links with the Olympic Council of Ireland

A number of firsts were achieved in partnership with the Olympic Council of Ireland in 2017. It marked the first occasion in which the Sport Ireland Institute provided support to the Irish Winter Olympic Squad with an educational workshop and a series of medical screens.

The Sport Ireland Institutes' Director of Performance Support, Phil Moore, supported the European Youth Olympic Festival Team as Deputy Chef de Mission, providing post Games support to the Olympic Council of Ireland with a comprehensive event debrief.

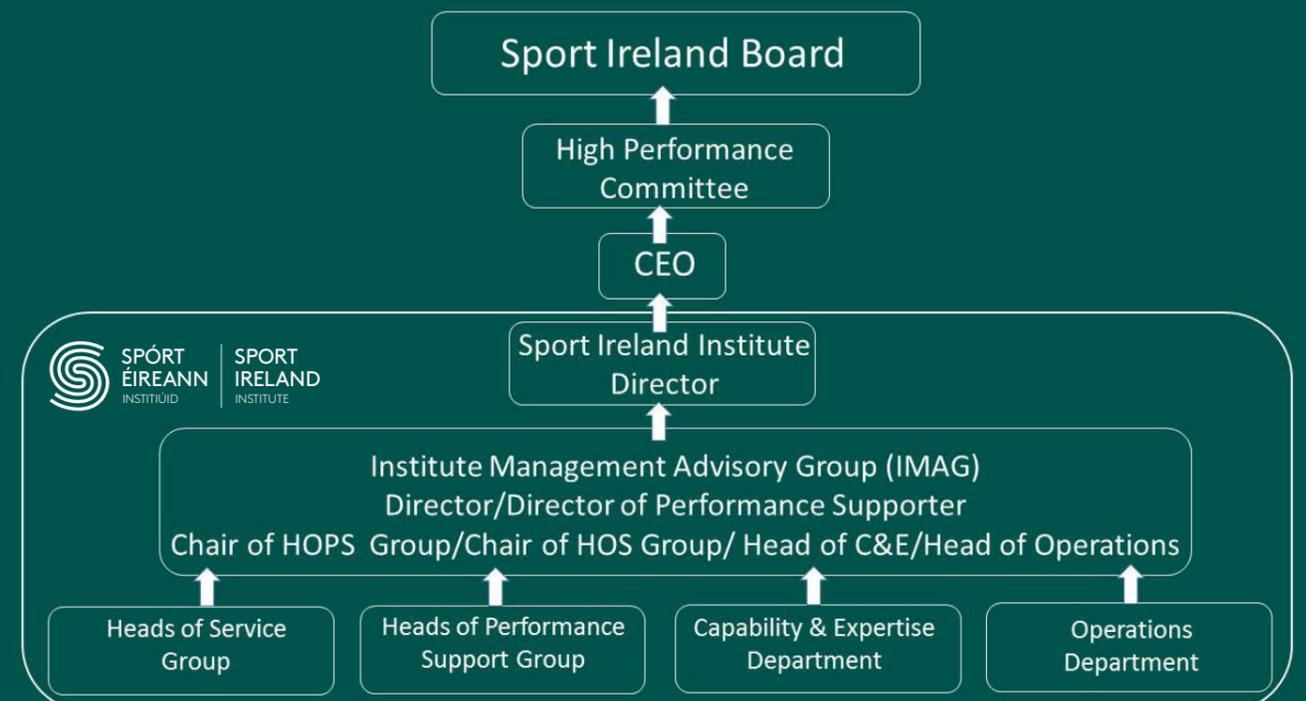
A number of meetings have also taken place with the Olympic Council of Ireland with a view to progressing a new performance support delivery model for the full suite of Team Ireland events from European Youth Olympic Festival to the Olympic Games. Of significance is the potential for greater system alignment between the Olympic Council of Ireland, the NGBs, and Sport Ireland in targeting Games success.

6.0 Sport Ireland Institute's Governance Structure

The Sport Ireland Institute is a unit of Sport Ireland, thereby alignment of our programmes and policies with Sport Ireland is a prerequisite. The Sport Ireland Institute is the high performance support delivery unit of Sport Ireland which works alongside the High Performance Unit (the high performance policy and investment unit).

The High Performance Committee is a full sub-committee of Sport Ireland and provides oversight on the programmes and services of the Sport Ireland Institute and makes recommendations on high performance to the Sport Ireland Board, whom are the ultimate decision making authority of Sport Ireland.

The Director of the Sport Ireland Institute reports to the CEO of Sport Ireland.



The following members served on the High Performance Committee in 2017:

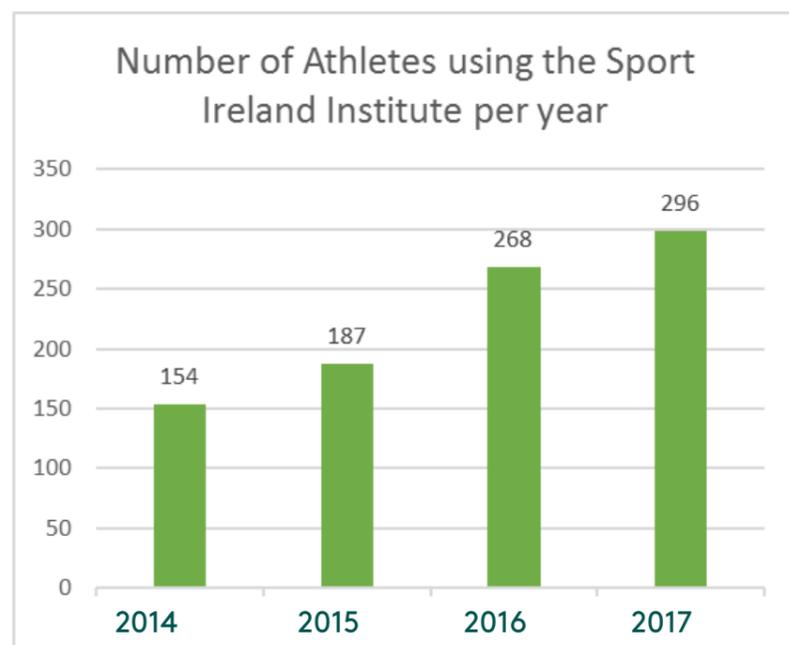
- Liam Sheedy - Chairperson
- Roy Dooney - Sport Ireland Board Member
- Stephen Martin - Olympic Council of Ireland nominee
- Miriam Malone - Paralympics Ireland nominee
- Olive Loughnane - Independent
- Caroline Currid - Independent
- Mike Heskin - Independent
- Shaun Ogle - Sport Northern Ireland nominee

Sport Ireland executives whom attend meetings of the High Performance Committee at the discretion of the Chairperson include:

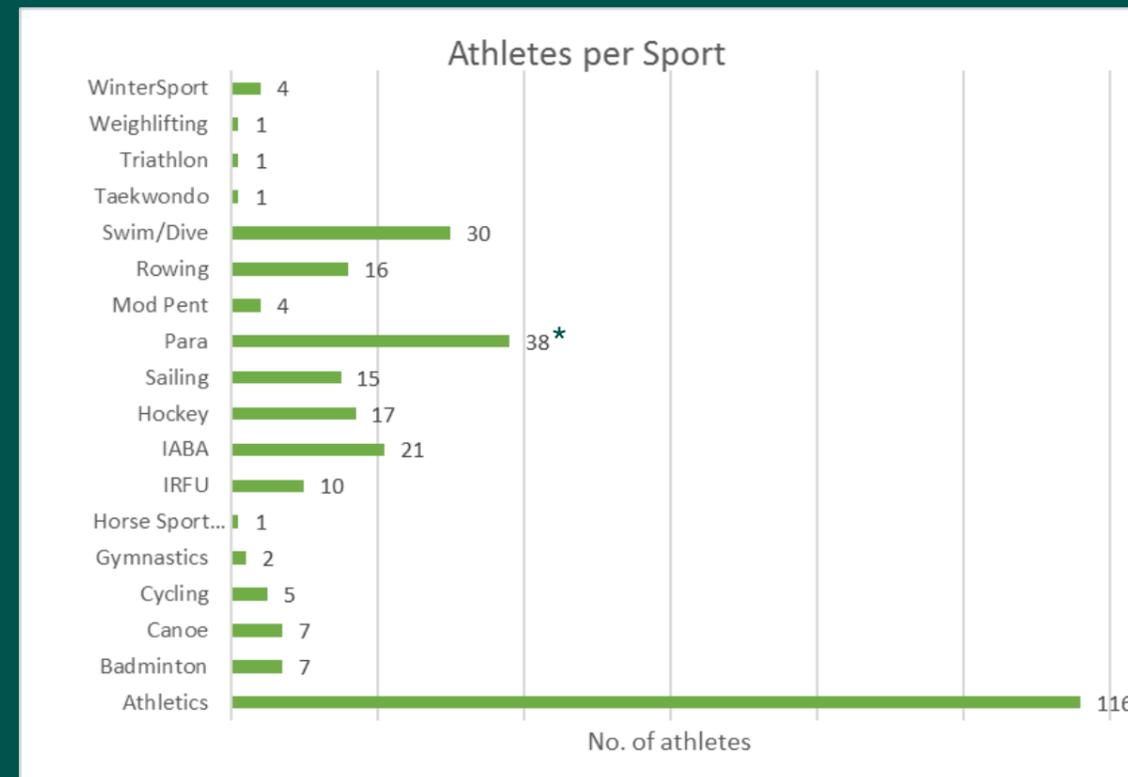
- John Treacy - CEO
- Paul McDermott - Director, High Performance Unit
- Liam Harbison - Director, Sport Ireland Institute
- Phil Moore - Director of Performance Support, Sport Ireland Institute
- Niamh O'Sullivan - Manager, High Performance Unit

7.0 Sport Ireland Institute User and Performance Support Statistics

7.1 High Performance Athlete Usage of Sport Ireland Institute

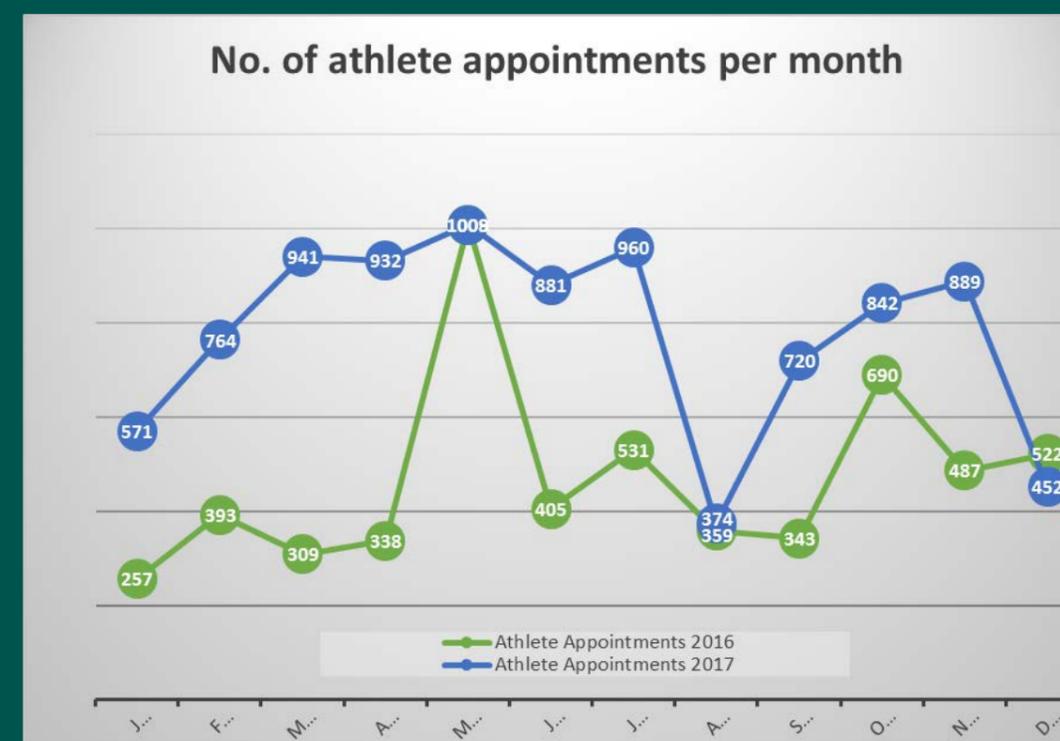


7.2 High Performance Athlete Usage per Sport



*Athletics Ireland & Paralympics Ireland provided additional resource in order to receive additional services to greater numbers of athletes

7.3 Athlete Service Appointments

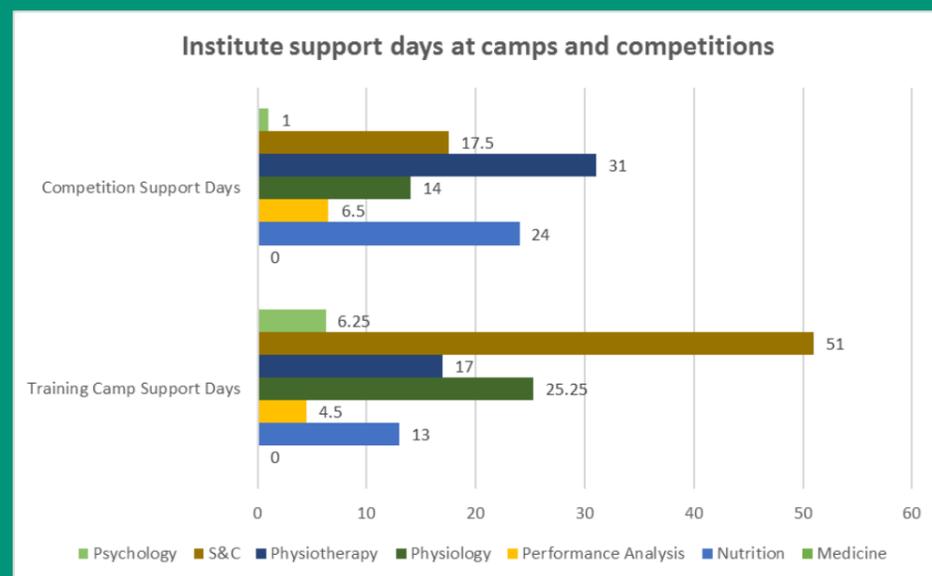


7.4.1 Number of Institute Direct Support Days Per Sport in 2017

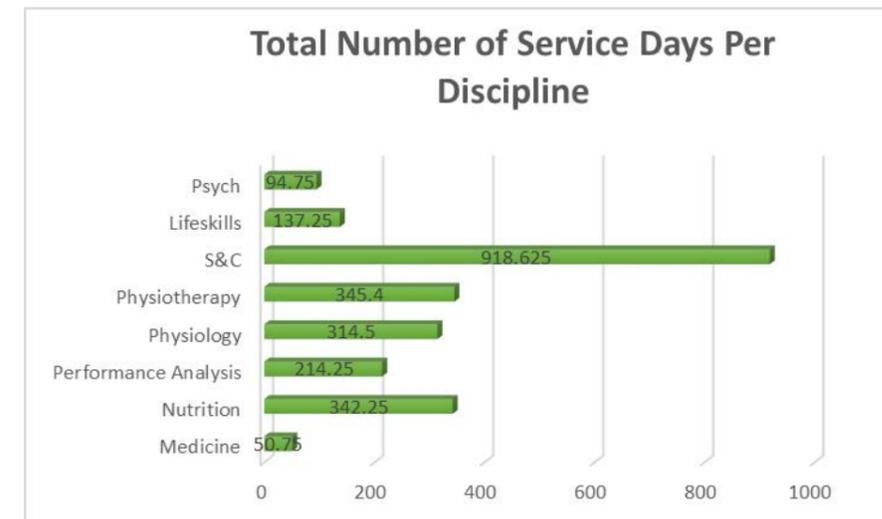
| Sport | Days | %Total |
|-----------------------------------|---------------|--------|
| Athletics Ireland | 486.6 | 26.0% |
| Badminton Ireland | 43.3 | 2.3% |
| Canoeing Ireland | 27.0 | 1.4% |
| Cycling Ireland | 7.8 | 0.4% |
| Hockey Ireland | 181.3 | 9.7% |
| Horse Sport Ireland | 2.0 | 0.1% |
| Irish Athletic Boxing Association | 264.0 | 14.1% |
| Irish Sailing Association | 159.8 | 8.6% |
| Paralympic Athletics | 113.5 | 6.1% |
| Paralympic Cycling | 80.5 | 4.3% |
| Paralympic Other | 27.0 | 1.4% |
| Paralympic Swimming | 88.3 | 4.7% |
| Pentathlon Ireland | 96.3 | 5.2% |
| Rowing Ireland | 177.3 | 9.5% |
| Swim Ireland | 99.5 | 5.3% |
| Team Ireland Golf Trust | 1.0 | 0.1% |
| Triathlon Ireland | 3.8 | 0.2% |
| Irish Taekwondo Union | 11.0 | 0.6% |
| TOTAL DAYS | 1869.5 | |

Represents the number of days support providers are directly engaged providing support to a sport.

7.5 Institute Provided Service Days at Camps & Competitions

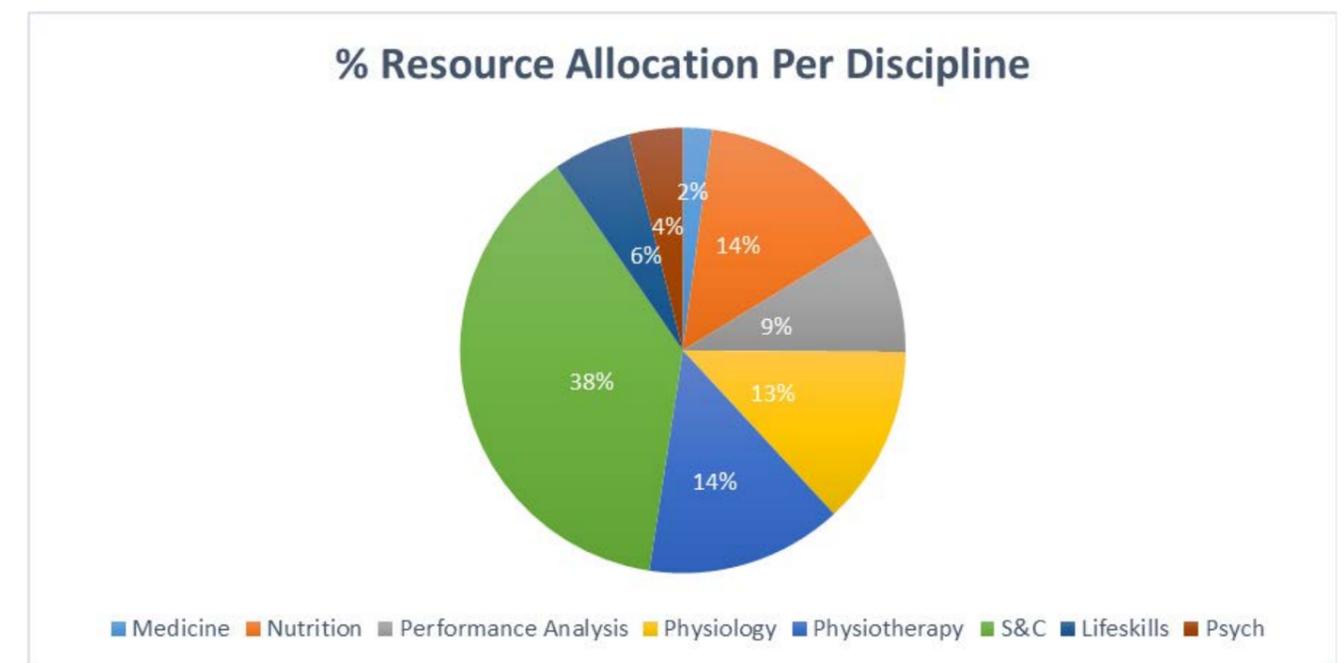


7.6 Total Number of Service Days per Discipline



Represents the total number of days provided by each discipline. This includes non-direct support including session preparation and review, sport review meetings, service management and planning, record keeping etc. The total number of service days was 2,418.

7.7 Performance Support Resource Allocation Per Discipline



8.0 Finance

| Expenditure | € | Income | € |
|------------------------|--------------|---------------|--------------|
| Human Resources | 1,685,813.92 | Sport Ireland | 2,066,543.00 |
| Performance Services | 148,723.55 | NGBs | 64,700.00 |
| Capability & Expertise | 64,784.44 | HPC Usage | 56,188.50 |
| Operations | 283,807.17 | PQAP | 580.00 |
| | 2,183,129.08 | | 2,188,011.50 |

9.0 Performance Support Highlights Per Discipline

9.1 Athlete Lifeskills

- Eoin Rheinisch was appointed as Head of Athlete Lifeskills in mid 2017 and developed an athlete lifeskills strategy to be rolled out over the Tokyo 2020 cycle.

- The Athlete Lifeskills Team has grown to three support providers with the addition of Emma Saunders and Niall O Donoghue, who will drive the strategy for education and career respectively.

- In October nine Winter Olympic hopefuls attended the Evolution Series Workshop at the Sport Ireland Institute in collaboration with the Olympic Council of Ireland. The purpose of the workshop was to prepare athletes for the Olympic experience and equip them with the skills to plan effectively for before, during and after their Games. This event marked the first time the Sport Ireland Institute and the Olympic Council of Ireland have collaborated to provide support for the winter team.

- The Sport Ireland Institute was part of a successful application for an EU funded project in partnership with University of Limerick and many other European partners including Comitato Olimpico Nazionale Italiano (the Italian Olympic Committee) and Institut national du sport, de l'expertise et de la performance (the French National Institute of Sport, expertise, and performance). The Education Model for Parents of Athletes In Academics (EMPATIA) project will focus on dual careers in particular targeting parents of athletes. The project will gather information about the roles of parents and guardians of athletes in their dual careers, producing resource materials and offering online education modules in several languages.

9.2 Medicine

The provision of Medicine services is central to the role of the Sport Ireland Institute. Sports medicine incorporates the total medical care of athletes from pre-participation medical screening through to management at consultant level of appropriate illnesses or injuries. The services include diagnosis, investigation, treatment and rehabilitation of injuries and illness occurring during or as a consequence of training and competition. The Sport Ireland

Institute has established a rapid access referral system with the National Orthopaedic Hospital at Cappagh and with other centres for specialist opinions and services.

The Sport Ireland Institute operates a medical clinic for athletes across three half days per week. The extent of medical testing, referral and supports provided to athletes by the Institute Medical Team in 2017 are as follows:

| Institute Medical Tests 2017 | Quantity |
|------------------------------|----------|
| Blood Screens | 125 |
| Imaging: | |
| - MRI | 33 |
| - Dexa | 19 |
| - X-Ray | 2 |
| - CT Scan | 1 |
| Cardiac Screening | 42 |
| Respiratory Screening | 41 |
| Guided Injections | 4 |
| Flu Vaccines | 77 |
| Referrals | 16 |

9.3 Psychology

- Uptake in sport psychology services increased significantly in 2017. A number of sports such as athletics, clay target shooting, rowing and cycling who had had little to no meaningful sport psychology input for the Rio cycle, are now putting structures in place to support their athletes through to Tokyo.

- Priority sports such as sailing and athletics are also working towards delivering sport psychology to athletes in their development pathways.

- Clinical sport psychology is also being delivered by Dr. Paul Gaffney on referral to an increasing number of athletes across a range of sports.

- The expansion of the range of qualified and experienced applied practitioners in the field is a continuing priority in order to satisfy the demand for this service from the high performance sports. The next phase of this is the creation of a trainee sport psychologist position to be filled in early 2018.

- The Sport Ireland Institute, led by our Lead Sport Psychology Consultant, established a network of experienced sport psychology practitioners, who meet quarterly to share information on interventions and useful resources, and discuss interesting case studies. This peer support network currently consists of seven sport psychologists who are working regularly in high performance systems either through the Sport Ireland Institute contracts or directly through NGBs.



Olympic Finalist - Diving, Oliver Dingley, Head of Performance Nutrition, Sharon Madigan, Lightweight Rowers Mark O'Donovan & Shane O'Driscoll.

9.4 Nutrition

- The Nutrition Team delivered a one day HPX Nutrition Symposium partnering with the National Dairy Council investigating bone health in athletes.
- The usage of the Performance Kitchen has greatly increased with the athlete cooking demonstrations and the new Sport Ireland Institute Breakfast initiative which commenced in late 2017. The response to date has been very positive with one Performance Director commenting:

"Excellent initiative. Phenomenal opportunity for athletes/staff to interact across sports. Really good opportunity for service providers to have more casual communication with athletes which often can be very powerful and impactful".

- The Nutrition team supported the Swim Ireland Body Image Conference targeted at teenage girls in sport. This provided an opportunity to highlight key components of RED-S (Relative Energy Deficiency in Sport) and the female athlete triad (disordered eating, amenorrhea and osteoporosis).

9.5 Performance Analysis

- Performance Analysis support was provided in 2017 to boxing, athletics, and Para-Athletics (throws)
- The Sport Ireland Institute have been working closely with a major data analytics provider in 2017 to scope out a series of visual analytics opportunities that will impact on athlete performance at Tokyo 2020. This partnership has commenced work on its first project, the aim of which is to confirm a 'proof of concept', following which the partnership will be announced and a further three projects will be commenced in 2018 and 2019.
- In late 2017 the Sport Ireland Institute launched the use of a video sharing platform – dartfish.tv. The purpose of this platform is to have a centralised online location where competition and training footage can be shared easily across multiple coaches, athletes and within the wider service team across a range of high performance sports. This was in response to a number of sports requesting a cloud based system to facilitate video sharing. A bespoke package of tools is now available and being used by a number of high performance sports.
- A specific workshop for performance analysts themed 'What is so important that we need to share it?' was run in conjunction with the HPX conference. 30 analysts, coaches and lecturers working within a variety of sports in Ireland participated. The primary outcome from this day was the creation of a performance analysis specific blog (Irish Performance Analysis Exchange – IPAX) for the Irish performance analyst and coaching community – www.ipax.online

9.6 Physiology

- Physiological testing and support in 2017 was provided to athletes in Athletics, Badminton, Modern Pentathlon, Para-Athletics, Para-Swimming, Para-Cycling, Swimming and Sailing. This included support at domestic and international training camps for Para-Swimming and Para-Cycling.
- Intensive physiological monitoring, testing and support was provided to the Rowing Ireland high performance squad across 2017 in preparation for World Cups, European and World Championships. Most of this support took place at their domestic training base at the National Rowing Centre in Cork as well as abroad at pre-event training camps in Seville, Banolyes and Gavirate (Italy).
- In conjunction with the Sport Institute Northern Ireland, we facilitated a series of altitude training sessions across May and June to help prepare and acclimatise members of the Men's Hockey squad for semi-final of the World Hockey League taking place at altitude in Johannesburg in July.
- The Physiology Team led a number of professional development initiatives including:
 - A workshop to physiologists across third level institutions standardising rowing physiology testing protocols.

- With Cycling Ireland, hosted and facilitated physiological testing of handcyclists in January with renowned international handcycling coach, Ralf Lindschulden, who demonstrated protocols using adapted ergometers.
- Collaborated with the Nutrition Team to host the HPX Symposium on 'Athlete Health – From top to bottom and everything in between'.
- A joint workshop was held with the Sports Institute Northern Ireland aimed at collaborating to align our testing protocols and enhance athlete support through shared projects.

9.7 Physiotherapy

- The Rehab service delivered integrated support to senior athletes in Athletics, Badminton, Diving, Men's Hockey, Swimming, and Modern Pentathlon. Ongoing support is given to identified cyclists when based in Ireland.
- Rehabilitation project athlete support was provided for an identified canoeist and gymnast post-surgery and horse sport.

"5th at the U23 World championships! Over the moon with this result! A few months ago I wasn't even sure I would be able to compete here because of my hip surgery! Big thanks to the team at the Sport Ireland Institute for getting me back on the startline"

- Liam Jegou, Canoeing



Liam Jegou, Bratislava Open, July 2017.

- Testing for a novel project in conjunction with the Faculty of Health Sciences took place at the Sport Ireland Institute - "Spatial distribution of trunk muscle activity and lumbar sagittal kinematics on a repeated loaded task (rowing); a comparison of people with and without a recent history of low back pain". Head of Rehabilitation, Sarah-Jane McDonnell is a researcher on the project.

- The Sport Ireland Institute team identified a need to upskill support teams and technical coaches in the area of holistic management of pain. We hosted a dedicated work shop by Dr. Richmond Stace for the medical team on pain coaching in the elite sporting population. We also coordinated a work shop for the Sport Ireland Institute and NGB support staff, technical coaches and sports management around the burden of the management of pain in the preparation of athletes.

- Developed the following resources for Athletics Ireland, which are to be included in their future coaching curriculum:

- AAI Trackfit Injury Prevention Program
- AAI Foot & Ankle Conditioning Program
- AAI Mobility Program

- The Rehab and Sports Medicine team developed an infographic on Injury and Illness in Junior Level Athletes for Athletics Ireland.

- The Sport Ireland Institute presented to the Endurance Coach Network on Injury Prevention.

9.8 Strength & Conditioning

- 2017 saw a major increase in quantity of Strength and Conditioning (S&C) support to elite Irish athletes and increased footfall/usage at the Sport Ireland Institute S&C facility. In particular increases in service delivery have been identified in podium potential sports. S&C service delivery now covers 11 sports on an on-going basis covering 95 athletes. The department also offers regular facility and "project support" to another 5 sports.

- In 2017, the Sport Ireland Institute S&C team commenced supporting the Irish Senior Men's Hockey program with twice weekly S&C sessions for nationally identified Leinster based players.

- The Sport Ireland Institute S&C team in 2017 also commenced direct S&C support for elite rowers based at the National Rowing Centre, Cork.

- In April the S&C team in conjunction with the rehabilitation team, organized and hosted a one-day symposium as part of the HPX knowledge exchange series. The theme of the event was "Maximizing the Impact of Service Delivery in High Performance Sport". This was well attended (>90 attendees) with very positive feedback received.

- Two professional development and networking events for S&C coaches involved in elite sports in Ireland were hosted at the Sport Ireland Institute. These events included staff from the Sport Ireland Institute, Hockey Ireland, FAI, IRFU, Cricket Ireland, UCD and DCU. The aim of these well attended events (>30 attendees) is to develop the profile of the Sport Ireland Institute as a centre of S&C excellence in this country.

10 Capability & Expertise Programmes

10.1 Pursuit of Excellence Programme Report

On June 12th an independent review report on the Pursuit of Excellence Programme (PEP) was launched in the National Indoor Arena. The report reviewed the impact of the PEP Programme from 2014 - 2016.

The review identified a series of recommendations designed to strengthen and evolve the PEP Programme during the 2020 cycle with a similar bespoke support programme offering to Performance Directors being particularly highlighted.

"PEP has provided support and connection in a complex and sometimes fragmented environment. That sense of community and expert critical analysis and experience stimulated positive change in my coaching practice and contributed in a very practical and impactful manner on my performance as a coach in Rio."

- PEP Coach Feedback



10.2 Sport Ireland Institute CPD

In 2017 the Sport Ireland Institute designed and delivered its first ever dedicated professional development programme for its team. The programme involved a mixed blend of discipline specific mini symposium events (4), themed master classes (3) and financial grants (12) to enable team members to develop their capability while attending international conferences. The programme was reviewed in December 2017 and nine key recommendations have been identified.

The internal team programme will be scaled back in 2018 in order to prioritise professional development support programmes for Performance Directors, coaches and performance support personnel.

10.3 Sparking Performance

In late 2017, the Sport Ireland Institute initiated a consultation process with CEOs and PDs of the high performance sports designed to define and develop a professional support programme for PDs. The programme is entitled "Sparking Performance" and builds upon previous work completed on the theme of performance leadership within Sport Ireland. This programme will be rolled out in 2018.



Olympic Finalist - 400m, Thomas Barr.



Olympic Finalist - Men's 3m Springboard, Oliver Dingley.

11 Research

The Sport Ireland Institute supported four PhD research programmes in 2017. Our research policy is currently under review and will be finalised in 2018.

11.1 Ciara Sinnott-O'Connor



The aim of this PhD is to evaluate an effective multi-faceted athlete monitoring system for Paralympic athletes to determine if this can effectively identify the individual responses to training, competition and recovery and the relationship with occurrence of illness and injury.

- Study 1 determined the relationship between training load (TL), subjective wellness markers and incidence of illness and injury in Paralympic footballers across three seasons. Results suggest wellness markers are significantly impacted by illness but not injury. Furthermore, illness occurrence was associated with spikes in TL measures in the previous week.
- Study 2 examined the validity of session-RPE (Rate of Perceived Exertion) for quantifying TL in Paralympic swimmers. Strong correlations were observed between session-RPE and 2 heart rate based equations.
- Study 3 determined the relationship between TL, subjective wellness markers and incidence of illness and injury in Paralympic swimmers. Both illness and injury were shown to negatively impact on scores for wellness markers. In agreement with Study 1, spikes in TL measures were significantly associated with illness occurrence and showed similar trends prior to reports of injury.
- Study 4 examined the use of salivary biomarkers in Paralympic swimmers as an objective monitoring tool and the response to training and major competition (Rio 2016 Paralympic Games). Results showed a dose-response relationship with TL during periods of training, intensified training and taper. Critically, significant increases were observed during competition despite a decrease in TL demonstrating the psychophysiological stress response associated with participation in major competition.

In 2017, the focus has been on data analysis and write up of the thesis. An initial preliminary draft was submitted to supervisors in August and the final draft due for submission in March 2018. The first journal article from the data was submitted to the International Journal of Sports Physiology and Performance and accepted for publication in November. A second paper is currently under review.

11.2 Claire Brady



This PhD program has thus far:

- Established the reliability and validity of a strength diagnostic testing system for use with the Sport Ireland Institute.
- Established normative data for key strength diagnostics tests for Sport Ireland athletes.
- Begun to explore the link between strength diagnostic testing and sports performance (sprint speed).
- The PhD scholar has contributed significantly to additional physical performance testing within the Sport Ireland Institute S&C team across sports including: Women's Hockey national team, Athletics, Para-Athletics and Women's Sevens Rugby.

A paper written for an Independent Learning Module for the University of Limerick was written up for publication and was published in the Strength and Conditioning Journal in February 2017. The first section of the literature review was submitted to Sports Biomechanics in February 2017, and was accepted for publication in March 2018. Objective 1 has been achieved (to investigate the reliability of the diagnostic system and associated variables). This paper has been written up and submitted to the International Journal of Sports Physiology and Performance. In November 2017 the paper was accepted for publication. Progress has been made with objective 2 (to establish sport specific strength and power standards, through the use of the diagnostic system, that can be used to guide training) and 3 (to correlate the variables derived from the diagnostic system to sport specific performance indicators) with track and field sprint athletes and hurlers (team sport). Testing for the sprint group is completed and by the end of March, all data will be collected for the hurling group. The scholar spent six weeks in Edith Cowan University, with Dr. Greg Haff and his research team and is involved in the write up of two papers from her time there. The scholar is completing a structured PhD through the University of Limerick and has completed all structured components.

11.3 Emma Burrows



The aim of this PhD programme is to develop and evaluate a theory-informed intervention to increase Irish Olympic and Paralympic athletes' ability to adapt to the transition they experience upon returning home from the Olympic and Paralympic Games.

To date the programme has:

- Interviewed past Olympic and Paralympic athletes, coaches and support providers about the key factors which impact an athlete's interest in attending an intervention to prepare for the post-Games transition.
- Developed and delivered a psychoeducation intervention to 187 athletes, coaches and athlete support providers in advance of the Rio 2016 Games.
- Gathered information on participant's satisfaction with the workshops and made recommendations to improve the delivery of future interventions.
- Examined the effectiveness of an animated video for communicating information about the post-Games transition.

In 2017 the PhD programme has focused on examining the characteristics of psychological interventions delivered by countries such as the USA and Canada, which aimed to prepare athletes for the Games experience as a whole. The purpose of this review was to compare the factors which affect an athlete's interest in, and ability to engage in, interventions which prepare them for the transition into and home from the Games. By doing this we aim to identify potential barriers to participation which are common worldwide, and also factors which are unique to the Irish context. We aim to publish the results of this review in the near future and provide recommendations which athlete support providers can use to increase athlete engagement.

11.4 Danielle Logue



The aim of this PhD programme is to identify low energy availability (LEA) risk in male and female athletes and to determine associations between LEA risk and injury, illness, health and performance in both gender groups. The identification of LEA risk may help to reduce musculoskeletal injuries, illness and improve performance.

To date the programme has:

- Published a narrative review on "Low Energy Availability in Athletes: A Review of Prevalence, Dietary Patterns, Physiological Health, and Sports Performance" in Sports Medicine.
- The most validated questionnaires were identified and a cross-sectional online survey was conducted to determine risk of LEA among females (900n) and associations between LEA and injury, illness, health and performance in this gender group. A paper has been prepared for submission for publication to the European Journal of Sports Science.
- Conducted an observational, cross-sectional study with male army cadets (82n) to determine energy deficiency in active males and to determine associations between LEA and body composition, injury, illness, health and performance in a male population sample.
- Examined the dietary intake of physically active males and females undertaking military training in Ireland.

In 2017 the PhD programme has focused on conducting an observational, cross sectional study in physically active males and females undertaking elite level training. Energy intake and exercise energy expenditure of males between the months of September and December 2017 was assessed to determine energy deficiency in this group. Data on injuries, illnesses, body composition and performance was also collected. The associations between LEA and injury, illness, health and performance will be evaluated in this gender group and used to identify energy deficiency symptoms. We aim to publish the results of this research and this data will be used to increase physical well-being in high performance sport and should lead to increased awareness of the importance of protecting health in elite sport.



Paralympic Wheelchair Racer - Marathon, Patrick Monahan.

12.0 Partners

12.1 National Dairy Council

The Nutrition department has worked closely with the National Dairy Council in terms of developing a performance nutrition message that is consistent with evidence based practice and with the view of promoting sound performance nutrition messages. Partnership activities in 2017 included:

- Sport Ireland Institute hosted a Q&A session for athletes and the media as part of World Milk day.
- Dr. Sharon Madigan facilitated a Q&A session with the public at the National Ploughing Championship .

- Content was also developed in terms of video blogs and paper resources which can be used with athletes and coaches.

12.2 Training Partnerships

The Sport Ireland Institute has maintained key partnership relationships with the Irish Defence Forces and An Garda Síochána. Their support is focused on training initiatives with the high performance Community. In 2017, the Defence Forces hosted two team building training camps for the Irish Hockey squads and provided key event support to the HPX Conference.

These partnerships are key to the rollout of our high performance people development programmes and will be greatly utilised over the remainder fo the Tokyo 2020 cycle.

13.0 Outlook

With the growing emergence of the High Performance Training Centre as the dedicated training base for a number of high performance sports and the growing partnership model with the high performance sports, the outlook for the Sport Ireland Institute is very positive in terms of the impact we can have on athlete performance at major championships. We are committed to further growth and support of the high performance sports to achieve their strategic vision.

2018 will see an extension of our standard opening hours to include evenings and Saturdays as standard for the first time. This is in response to the demands of the high performance sports and to allow the sports we support provide greater opportunities to their squads to access the High Performance Training Centre.

13.1 Strategy

Sport Ireland is set to publish a new corporate strategy in 2018. Following this, the Sport Ireland Institute will roll-out a unit strategy to map out our vision for the coming period from 2018-2024.

13.2 High Level Objectives

The Sport Ireland Institute has a comprehensive work programme for 2018 centred round the following strategic areas:

- Institute strategy development
- Performance services delivery
- Partnership with the Olympic Council of Ireland
- Institute as the home of High Performance Sport
- High performance people development

The high level objectives are underpinned by a detailed series of service level objectives for each department and discipline within the Sport Ireland Institute.



Olympic Silver Medallists - Lightweight double sculls, Paul & Gary O'Donovan.

14.1 Sport Ireland Institute Support at International Competitions & Training Camps

| Sport | Event | Institute Support |
|-------------------|---|--|
| Athletics | Junior Warm Weather Camp, Portugal | Paul Carragher - Physiotherapy Sharon Madigan - Nutrition |
| | European Junior Championships, Italy | Paul Carragher - Physiotherapy Martina McCarthy - S&C |
| | IAAF World Championships, Great Britain | Paul Carragher - Physiotherapy |
| Boxing | Pre European Championships Camp, Ukraine | John Cleary - S&C Alan Swanton - Performance Analysis* |
| | Pre World Championships Camp, Great Britain | John Cleary - S&C Sharon Madigan - Nutrition Ronan Doherty - Nutrition |
| | World Championships, Germany | Alan Swanton - Performance Analysis* (* support delivered remotely) |
| Diving | FINA World Championships, Hungary | Paul Conneally - Physiotherapy |
| Hockey | Warm weather camp, Spain | Danielle Logue - Nutrition |
| | World League 3, N. Ireland | Danielle Logue - Nutrition |
| | World League 4, South Africa | Danielle Logue - Nutrition |
| Modern Pentathlon | UIPM World Championships, Egypt | Martina McCarthy - S&C |
| Olympic Sport | European Youth Olympic Festival, Hungary | Phil Moore - Deputy Chef de Mission |

| | | |
|------------------|--|--|
| Paralympic Sport | Warm weather swim camp, Spain | Noel Murphy - S&C Ciara Sinnott O'Connor - Physiology |
| | World Para-Swimming Series, Great Britain (Sheffield) | Ciara Sinnott O'Connor - Physiology Alan Swanton - Performance Analysis |
| | World Para-Swimming Series, Germany | Ciara Sinnott O'Connor - Physiology Alan Swanton - Performance Analysis |
| | World Para-Swimming Series, Great Britain (Manchester) | Ciara Sinnott O'Connor - Physiology |
| Rowing | Warm Weather Camp, Spain | Caroline MacManus - Physiology |
| | Pre European Championships Camp, Italy | Sarah-Jane McDonnell - Physiotherapy Antonia Rossiter - Physiology |
| | FISA European Championships, Czech Republic | Sarah-Jane McDonnell - Physiotherapy |
| | FISA World Cup 3, Switzerland | Sarah-Jane McDonnell - Physiotherapy |
| | Pre World Championships Camp, Spain | Sarah-Jane McDonnell - Physiotherapy Niamh Ni Ceallachoir - Physiology |
| | FISA World Championships, USA | Sarah-Jane McDonnell - Physiotherapy |
| Sailing | European Championships Preparation | Ronan Doherty - Nutrition |

14.2 Published Papers by Sport Ireland Institute Team Members

Brady, C.J., Comyns, T.M., Harrison, A.J., Warrington, G. Focus of attention for diagnostic testing of the force-velocity curve. *Strength and Conditioning Journal*, 39 (1), 2017.

Brady, C.J., Harrison, A.J., Flanagan, E.F., Haff, G.G., Comyns, T.M. A comparison of the isometric mid-thigh pull and isometric squat: intraday reliability, usefulness and the magnitude of difference between tests. *International Journal of Sports Physiology and Performance* (accepted November 2017)

Carling, C.J., Lacombe, M., Flanagan, E.P., O'Doherty, P. and Piscione, J., 2017. Exposure time, running and skill-related performance in international u20 rugby union players during an intensified tournament. *PloS one*, 12(11), p.e0186874.

Flanagan, E.P., O'Doherty, P., Piscione, J. and Lacombe, M., 2017, The demands of the game – a descriptive analysis of the locomotor demands of junior international rugby union. *Journal of Australian Strength and Conditioning*. 25 (7).

Logue D, Madigan SM, Delahunt E, Heinen M, Mc Donnell SJ, Corish CA. Low Energy Availability in Athletes: A Review of Prevalence, Dietary Patterns, Physiological Health, and Sports Performance. *Sports Med*. 2018 Jan;48(1):73-96. doi: 10.1007/s40279-017-0790-3. Review.

14.3 Keynote Addresses by Sport Ireland Institute Team Members

- Dr. Sharon Madigan presented research "Twelve-weeks oral spray Vitamin D3 supplementation does not alter bone turnover markers in collegiate Gaelic footballers" at American College Sports Medicine Annual Conference, Denver, Colorado, May 31st-June 5th 2017.

- Dr. Sharon Madigan presented research "Risk of low energy availability and associated symptoms in active females in Ireland" at British Association of Sports Medicine Conference, Bath, October 2017.

- Dr. Sharon Madigan was a key note speaker at the World Dairy Congress in Belfast, October 2017, highlighting the importance of Nutrition in Performance.

- Dr. Sharon Madigan presented to the Irish Defence Forces on "Performance Nutrition", April 2017.

- Ronan Doherty was a speaker at the Royal College of Surgeons Winter meeting in Dublin January 2017, 'Lessons from the Rio 2016 Olympic Games. Making Weight: Perspectives from Rowing and Sailing.'

- PhD Scholar Danielle Logue presented her Phd research "The prevalence of low energy availability in active females in Ireland" at the Nutrition Society Irish Section Conference, Queens University Belfast, June 2017.

- Dr. Eamonn Flanagan was a key note speaker at the United States Olympic Committee High Performance S&C symposium in Colorado Springs in May.

- Dr. Eamonn Flanagan was a speaker on behalf of the Sport Ireland Institute recently at the British Association of Sport and Exercise Science 1-day seminar at UCD.

- PhD Scholar Claire Brady presented her PhD research at the International Conference on Biomechanics in Sport, Cologne, Germany, 14-18th June 2017

- Dr. Kate Kirby delivered a presentation at the inaugural invite-only Copenhagen Summit on Mindfulness and Acceptance Approaches in Elite Sport in April 2017.

- Dr. Ciara Sinnott-O'Connor presented her research on Salivary biomarker monitoring in Paralympic swimmers to the All-Ireland Postgraduate Conference, Carlow, Ireland April 21st-22nd 2017.

- Dr. Ciara Sinnott-O'Connor presented her research on Salivary biomarkers and training loads in Paralympic swimmers: A case study to the International Paralympic Committees VISTA Conference in Toronto, Canada.



Paralympic Silver Medallist - Discus Thrower, Niamh McCarthy



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