How have your interests in mathematics and biomedical sciences helped support your career to date?

I always wanted to undertake medical research and to head my own medical research centre. I started studying mathematics and biomedical sciences but majored in mathematics/statistics because I was much better at it than biomedical sciences and enjoyed it more.

In my third undergraduate year, I learned that there was a discipline called biostatistics – the application of statistical methods to medical and biomedical data. This was a major career determiner, as I discovered I could work in medical research but contribute to it by doing what I was best at. During my Master’s degree I learned of the career called ‘epidemiology’, which is concerned with understanding the patterns and determinants of disease and health. Quantitative epidemiology uses advanced biostatistical skills to understand patterns of ill health and their causes in populations.

I completed my PhD in Mathematical Statistics and have worked as a quantitative epidemiologist since the late 1980s. I have been the director of research centres specialising in injury/sports injury epidemiology and prevention since the early 2000s.

In what ways does your research aim to fill knowledge gaps for best practices on preventing and treating sports injuries?

Much international sports injury prevention research focuses on small groups of elite athletes. My own research interests are more related to community-level or recreational athletes. Unfortunately, there is very little readily available high-quality information about the types of injuries sustained by these populations. This is a major gap because if we don’t know how common injuries are, who is more or less likely to sustain them or what causes them, it is impossible to identify priority groups or develop measures to prevent injuries.

Much of my epidemiological research has involved the design and implementation of new sports injury data collection systems to redress this lack of information. I’ve also used data from hospitals in new ways to profile sports injuries in the general community. The other major knowledge gap is how to encourage athletes, coaches and others to adopt injury prevention measures so that they can have reduced injury risk – the focus of my NoGAPS project.

Can you tell us more about your NoGAPS project?

The NoGAPS project has developed an exercise training programme for community-level participants in what is arguably Australia’s most popular form of football – Australian football. The project is unique because it focuses on what needs to be done to prevent injuries and how to get people to change their behaviours for safety gains. Known as FootyFirst, the programme aims to reduce the risk of common leg injuries in community football. In 2015, the Australian Football League endorsed FootyFirst as a nationwide injury prevention programme. Football players and their coaches really like FootyFirst because they can see that it’s relevant to their game and is easily implemented into regular football training sessions.

What other projects do you hope to work on in the next few years?

I hope to undertake data-driven projects to answer questions like: ‘What is the risk of sustaining more than one injury when playing sport?’; ‘Why do some people repeatedly injure the same body part, while others sustain injuries to other parts of their body?’ and ‘Do people who sustain more than one related injury have worse prognosis and poorer injury/outcome than those with unrelated or single injuries?’

Another area I’d like to research is injury risk management for mass participation sporting events, such as marathons and cycling events. In our health conscious societies, many people take up such activities for fitness and enjoyment, but little is known about their inherent injury risks, or what people are currently doing to minimise their injury risks.

Finally, could you highlight the personal significance of receiving the 2015 American Public Health Association Injury Control and Emergency Health Services International Distinguished Career Award?

I am honoured to be receiving this award! It shows that my career focus has not just resonated in my own country but has also influenced the work of others worldwide. This is best shown by the following quote from the award citation: ‘Dr Finch raised international awareness of the public health importance of sports and recreation injury prevention while legitimising the line of research and pushing researchers worldwide to improve their methodology through her highly regarded work in the statistical analysis/coding/classification of sports injury surveillance data and the application of implementation science approaches to the prevention of sports injuries’.

**On statistics and safety**

**Professor Caroline Finch** is a quantitative epidemiologist with a keen focus on preventing injuries from sport and physical activity. She has helped develop several programmes that reduce injury risk and was recently given a prestigious award in recognition of her achievements.
Preventing injury, promoting activity

The Australian Centre for Research into Injury in Sport and its Prevention (ACRISP) conducts investigations that afford people the opportunity to participate in sport and physical activity safely. That, along with other related programmes, provides a means of living a healthier lifestyle.

GLOBALLY, A LACK of physical activity is recognised as one of the 10 leading risk factors for death. Indeed, it has been identified as a key contributor for non-communicable diseases such as cancer, diabetes and cardiovascular disease. It is therefore extremely important for human beings to participate in sport or other forms of exercise to maintain good health and lead longer lives.

However, in an ironic twist, physical activity can adversely affect health and wellbeing through increasing the risk of injury. In addition, research has repeatedly demonstrated that many sports injuries are a precursor to long-term musculoskeletal problems that can cause significant pain and the need for surgery.

Thus, finding a means of preventing sport-related injuries is essential for both reducing the financial burden they place on the healthcare system and encouraging the public to participate in physical activities. It is likely more people would become involved in sport if promotional strategies emphasised methods for safe participation.

ACRISP

One scientist with a drive to address these pressing needs is Professor Caroline Finch. As a leading researcher on sports injury epidemiology and prevention, she is ranked as one of the top 10 most highly published injury researchers in the world. Since 2010, she has been involved in collaborative projects supported by research grants totalling over AUD $5.2 million, which have had a strong impact on policy and practice.

Based at Federation University Australia, Finch is also the Director of the Australian Centre for Research into Injury in Sport and its Prevention (ACRISP), a multidisciplinary and collaborative research centre investigating injury risk management. It is one of only nine research centres worldwide to have been designated by the International Olympic Committee as Research Centre for the Prevention of Injury and Promotion of Health in Athletes and is composed of clinician, public health and sports science researchers. Under Finch’s directorship, the Centre has gone from strength to strength, largely due to its strong emphasis on integrated STEM approaches applied to sports medicine.

The outcomes from all of the team’s activities are disseminated in a way that ensures they have wide impact – a consideration at the forefront of Finch’s mind at all times: “My research is heavily focused on identifying what infrastructure and support structures are needed to facilitate the uptake of evidence-based safety measures. It also looks at barriers to these measures and asks how they could be translated into sustainable programmes that sports bodies could deliver,” she says.

ENCOURAGING PARTICIPATION

One of Finch’s proudest achievements to date is her National Health and Medical Research Council (NHMRC) Principal Research Fellowship. This fellowship supports a fascinating research programme intent on quantifying the extent of – and reasons for – the substantial health and social problems associated with sports injuries. In collaboration with researchers, research fellows and PhD students, Finch is developing and testing a range of innovative solutions that could be put in place to alleviate injuries and encourage more people to participate in sports and physical activity.

Finch has also collaborated with the Victorian Injury Surveillance Unit at the Monash Injury Research Institute to investigate the epidemiology of sporting injuries and model hospital data. This enabled her to profile both the frequency and rate of severe sports injuries. Drawing on her biostatistical skills as a quantitative epidemiologist, she has identified patterns and reasons for why injuries occur, placing her in a strong position to help reduce the public health burden of sports injuries in Australia. The research has led to long-term health, social and economic community benefits – and new methods for disseminating the findings to those likely to benefit from them are being continually assessed and adopted.

Finding a means of preventing sport-related injuries is essential for both reducing the financial burden of healthcare and encouraging the public to participate in physical activities.

FOOTYFIRST

Another recent project led by Finch demonstrates the importance she places on ensuring that her research findings have practical applications. The National Guidance for Australian Football Partnerships and Safety (NoGAPS) project, also funded by the NHMRC, identified factors that enable the translation of evidence-based injury prevention interventions into practice and evaluated the effectiveness of an evidence-based exercise training programme for lower limb injury prevention in the context of community football in Australia.

The resultant FootyFirst exercise training programme has received endorsements from Australian Football League coaches and...
**Professor Caroline Finch** is one of the world’s most prominent sports medicine and injury prevention researchers. She has been a full-time researcher for her entire career and has authored 345 items in peer-review journals or conference proceedings. Her research focuses on understanding sport injury prevention strategies and exploring safety measures and optimal processes for translating her research findings into policy and practice. She currently heads up ACRISP at Federation University Australia.

**A TRIO OF INITIATIVES**

We asked Professor Finch to name the three health service initiatives to improve sports injury prevention and outcomes she would implement if she could.

**I would institute a nationwide registry of injuries in community sport, including concussion/head injury and/or catastrophic injuries. Countries like the US have a good register of catastrophic sports injuries, but we have no such data collection in Australia.**

**I’d like to see much better translation of the scientific evidence-base for sports injury prevention into real-world safety policies and programmes. We should no longer assume that just because our research has undergone scientific peer-review by scientific/medical journals, our findings will be actioned in the sporting world.**

**There is currently a major disconnect between the health services sector, which bears the cost of the injury burden, and the sports delivery sector, which needs to implement preventive solutions. I’d like to see these two sectors unite to solve the problem. There is considerable scope, for example, in better educating coaches about sports safety and various first aid/medical providers about better field-side management of sports injuries.**

ENCOURAGING PARTICIPATION IN SPORT BY REDUCING SPORTS INJURY RISK

**OBJECTIVES**

To develop evidence-based approaches to prevent sports injuries and contribute to the development of sports safety programmes.

**KEY COLLABORATORS**

NoGAPS Project, Australia: Professor Belinda Gabbe, Monash University • Professor Jill Cook, Latrobe University • Professor David Lloyd, Griffith University • Dr Alex Donaldson, Federation University Australia

Women STEM Researchers within the Australian Centre for Research into Injury in Sport and its Prevention (ACRISP): Professor Jill Cook, Dr Tania Pizzari, Dr Ebonie Rio, Latrobe University • Dr Joanne Kemp, Dr Lauren Fortington, Dr Peta White, Sheree Bekker, Sally Bromley, Dr Dara Twomey, Federation University Australia

**PARTNERS**

Australian Football League • Australian Institute of Sport • Australian Rugby Union • Cricket Australia • International Olympic Committee Medical Commission • JLT Sport, Australia • New South Wales Sporting Injuries Committee, Australia • Sport and Recreation Victoria, Australia • Sports Medicine Australia • Victorian Health Promotion Foundation, Australia

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**INTERNATIONAL INNOVATION**

medical staff. It involves warm-up, strength and conditioning exercises to minimise the risk of injuries that could be sustained through playing football. "When athletes and coaches see that fewer players are injured and that their teams can play better football and win more games, they become even stronger advocates for FootyFirst," explains Finch. "Because it is based on the latest and best scientific evidence, sports medicine professionals also strongly support the NoGAPS project outcomes."

Ultimately, the aim of all of Finch’s research projects and programmes is to provide people with the opportunity to participate in sport in a safer way. By affording people in Australia and beyond the chance to engage in physical exercise, Finch and her team enable both the public and professionals to lead healthier, happier lifestyles.