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Editorial

Do We Need to Make the Sport of Road Cycling Safer? Translating Research into Injury Prevention Practice (TRIPP) Framework for Road Cycling

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Abstract: Competitive road cycling is currently experiencing an epidemic of injuries with a growing concern for rider health and safety as we progress through 2024. Team principals/owners to pen open letters raising concerns about rider welfare, with Team INEOS owner, Sir Jim Ratcliff, calling on the 'governing bodies' to take "real action". Injury epidemiology research in sports medicine is one of the cornerstones of injury prevention. Many of the top-tier professional sports have organization-driven surveillance systems in place. The World Body for Cycling, UCI, published the 2030 agenda, highlighting the drive to "promote and support research in cycling epidemiology and medicine, especially for the benefit of lesser-known disciplines (epidemiology of medical and trauma pathologies)". The UCI has recently formed SafeR (for SafeRoad cycling), a specialist entity to oversee all aspects of cycling safety, like what has been seen in Formula 1 since the early 1990s. For the first time, the sport will have a dedicated safety body whose sole concern is to make the sport safer, reducing the risks to riders and spectators whilst losing none of the thrill of racing. Whilst all these efforts are extremely positive for the sport of cycling, in the absence of surveillance data on the prevalence and risk of injuries incurred during racing, the evidence to support such changes remains solely narrative. Everyone involved in the sport has a role to play in safety. This editorial highlights the importance of the UCI, SafeR, the CPA and athletes to engage with injury epidemiology researchers to understand the injury risk profiles of the sport, to then develop injury prevention recommendations' from this data and inform the implementation of them. Collectively this will be the first step in allowing governing bodies/professional leagues to begin to identify the risk factors to injury, provide targeted education at acknowledging the socioecological context of injuries in cycling and create a proactive environment around improving athlete health by reducing injury risk.

Keywords: Rider Health, Injury Prevention, Risk.

1. Introduction

Competitive road cycling is currently experiencing an epidemic of injuries with a growing concern for rider health and safety as we progress through 2024.[1] Indeed, there have been multiple mass rider crashes in recent months,[2] with the severity and burden of injuries appearing to increase. This has prompted team principals/owners to pen open letters raising concerns about rider

welfare. Team INEOS owner, Sir Jim Ratcliff, calls on the 'governing bodies' to take "real action" in his recent open letter.[3] With this risk of serious trauma and in some cases death, at some point, riders themselves are going to consider such risk and the impact on their loved ones and careers, potentially causing them to withdraw prematurely from the sport. Indeed, in the Tour of Poland in 2020 we witnessed the near death of Fabio



Jakobsen. Earlier this year in the Tour of Itzulia Basque Country, there was a mass rider crash in which the acute care of the riders was televised, sparking outrage from riders, their families and rider representative associations. Sadly in 2023, cycling mourned the death of Gino Mäder after coming off the road and down a ravine in the Tour Du Suisse and more recently at the 2024 World Championships in Zurich Swiss cyclist Muriel Furrer died when coming off her bike on a decent. There have been some positive moves by the world governing body for cycling, Union Cycliste Internationale (UCI) in protecting rider health. Cardiac screening was introduced as a mandatory requirement for UCI professional teams on all riders before the season. This came shortly after the death of Daan Myngher, a Belgian professional cyclist who died in hospital two days after suffering a heart attack in the 2016 Critérium International.

Injury epidemiology research in sports medicine is one of the cornerstones of injury prevention.[4] The preliminary model underpinning injury prevention was proposed by Van Mechelen et al. in 1992[5] in a 4-step prevention model sequence starting with injury surveillance. Finch et al. further revised this model in 2006 with the addition of 2 steps and the formation of a model known as the TRIPP (Translating injury prevention to practice) model.[6] (Table 1) Both models highlight the importance of injury surveillance as the foundation for developing evidence-based injury prevention programs and identifying factors that increase injury risk.

Indeed, many of the top-tier professional sports have organization-driven surveillance systems in place. Professional football back in 2001, developed the UEFA Football Safety

Project, aimed at improving athletes' health and reducing injuries, with a specific football injury reporting consensus first developed in 2006 and updated in 2022.[7] Similarly, rugby models have followed similar epidemiological systems put in place at both national and international levels.[8] This injury data has led to rule changes to reduce injuries, with a recent example in rugby being the rule changes to tackle height.[9] In football, rule changes [10, 11] have been made to heading the ball in the youth game. In 2022, the Scottish Football Association announced that its professional players would be banned from heading the ball the day before and the day after competitive matches. These rule changes have improved the safety of the game and reduced injury risk. Thus, the question is, can (and should) we develop similar models in professional road cycling? Competitive cycling has a consensus on reporting injuries in 2021 and one developed specifically for road cycling.[12, 13] However, professional cycling is far behind in the field of injury epidemiology, with a recent systematic review (currently awaiting publication) illustrating the lack of injury epidemiology work in the sport. The World Body for Cycling, UCI, published the 2030 agenda, highlighting the drive to "promote and support research in cycling epidemiology and medicine, especially for the benefit of lesser-known disciplines (epidemiology of medical and trauma pathologies)" (p106).[14] Furthermore, there has been a recent publication of the protocol to guide such epidemiological research across cycling disciplines from a preliminary study done at the Glasgow 2023 World Championships, laying the foundation for other authors to follow suit.[15]

Table 1: Translating Research into the Injury Prevention Practice (TRIPP) framework. [6]

Model Stage	Translating Research into the Injury Prevention Practice framework
1	Injury surveillance
2	Establish aetiology and mechanisms of injury
3	Develop preventive measures.
4	"Ideal conditions"/scientific evaluation
5	Describe intervention context to inform implementation strategies
6	Evaluate effectiveness of preventive measures in implementation context

The UCI has recently formed SafeR (for SafeRoad cycling), a specialist entity to oversee all aspects of cycling safety.[16] This entity is partly funded by professional road riders themselves which highlights the point that riders are concerned about the safety of the sport and want action. For the first time, the sport will have a dedicated safety body whose sole concern is to make the sport safer, reducing the risks to riders and spectators whilst losing none of the thrill of racing. This entity is like the Fédération Internationale de l'Automobile Advisory Expert Safety Committee in Formula 1, developed in 1994, following the deaths of two drivers in one weekend. The Cyclistes Professionnels Associés (CPA), led by former pro cyclist Adam Hansen, are also supporting safety reforms. Whilst all these efforts are extremely positive for the sport of cycling, in the absence of surveillance data on the prevalence and risk of injuries incurred during racing, the evidence to support such changes remains solely narrative. Thus, the UCI, SafeR and CPA must engage with injury epidemiology researchers to understand the injury risk profiles of the sport, then develop injury prevention programs from this data, implement them and then reassess their effectiveness in reducing injury risk as well as obtaining the 'athlete voice' into these programs. Thus, we are calling on the UCI to endorse a similar format to UEFA, where team doctors/physiotherapists will have a centralized system where acute injuries are logged monthly. Additionally, the cause of injuries can be influenced by various factors, including course design and thus, in cycling, we need to facilitate the formation of such models that allow for such data to be generated, not only showing injury prevalence but also injury risk and mechanism. This will not only provide us with a database of injury data within races, but over time, can provide us with a layer of data that can support rule changes, diagnostic protocols, and event planning, helping to ensure the safety of our riders and our sport.

Whilst injury surveillance will allow clinical academics and policymakers in cycling to understand what injuries happen and their respective prevalence, the context

of the injury is equally as important. We need to know how injuries happen, why they happen and how we prevent them. To achieve this, a socioecological view of injuries as proposed by Bolling et al. is the next logical step to improve the safety within the sport.[17] Such viewpoints help understand the dynamic interrelations between, among others, physical, biological, ecological, technical, economic, and social aspects of injury causation. With pro-cyclists agreeing that they are willing to take more risk, injury prevention researchers need to establish the context of this risk. Combined with injury surveillance it will begin to provide a foundation for injury prevention within competitive cycling. Whilst athlete health is at the center of every discussion, the growth in popularity of the sport with big corporate investments entering the sport in recent years, for example, Tudor, Lidl, Red Bull, and the discussion around a new ONE cycling 'super league' hoping to launch in 2026. These investments in the sport are encouraging, but these companies want to protect their investment, and will they be put off/or prospective sponsors if their multimillion-euro team leaders are regularly out for multiple months with injuries.? Indeed, it affects the fan interest of the sport when spectators are hoping to see great showdowns on the slopes of the Alps in the Tour de France in July only for this to be ruined by injuries sustained in crashes during early season races.

2. Conclusions and Future Recommendations

Competitive road cycling is currently experiencing an epidemic of acute injuries. Everyone involved in the sport has a role to play in safety. This editorial highlights the importance of the UCI, SafeR, the CPA and athletes to engage with injury epidemiology researchers to understand the injury risk profiles of the sport, to then develop injury prevention recommendations' from this data and inform the implementation of them. Furthermore, we highlight the importance of a socioecological view of injuries to help establish the context of injury and injury prevention, to enable practitioners, policymakers and representative organizations to make meaningful change

that improves athlete health by reducing acute injury risk at each socio-ecological level. Collectively, through prospective injury surveillance, this will be the first step in allowing governing bodies/professional leagues to begin to identify the risk factors for injury, provide targeted education at acknowledging the socioecological context of injuries in cycling and create a proactive environment around improving athlete health by reducing injury risk.

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