A statistical analysis on the difference and frequency of injuries on grass and 4g pitches in professional rugby.

Introduction

In the modern world, the game of rugby is changing from the traditional grass / turf pitches to a newer artificial 4g surface. In rugby injuries are seen as part of the game but since the introduction of 4g pitches many believe that plastic pitches are more dangerous and cause more injuries than grass. Our project will investigate from a player welfare perspective if we need more or less artificial pitches?

We decided to choose this topic as we all play a variety of sports, on both grass and artificial surfaces and had all recently sustained injuries. We chose rugby as we all have a common interest in the sport. Our aim is to decide in our opinion if 4g pitches are the way of the future for rugby. In this project we will firstly be investigating the number of injuries that are sustained on the two surfaces and compare and contrast the statistics. Then we will analyse the types and severity of injuries that occur on both surfaces, whether they occur to the limbs, the trunk or the head. We feel that this type of data will give us a true insight into how different surfaces impact the likelihood of sustaining an injury. With these statistics we will then compare the positives and negatives of both artificial and grass pitches to see if the new artificial surface is the right way to go.

HYPOTHESIS

We propose that the number of injuries sustained on artificial surfaces overall will be higher that those sustained on grass surfaces due to an article we read by the Irish times titled " staggering amount of injuries on 4g pitches compared to grass" . We also think that the number of leg injuries sustained will be higher on artificial surfaces however the number of injuries sustained to the head and trunk will be similar on both surfaces.

METHOD

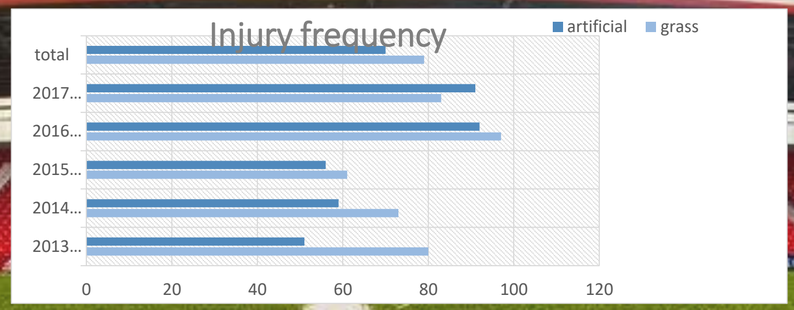
We began our project by gathering data from numerous national rugby associations, this was to minimise any bias by getting an overall view of the data. We ensured that our data was from a reliable source by checking the publishers credibility. In order to analyse our data we had three simple questions to categorize the injuries :type of pitch the injury occurred on, injury severity and type of injury. We measured injury severity in days absent from playing Eg) 1 day not severe, 20 days very severe and the type of injury as head, trunk or limb.

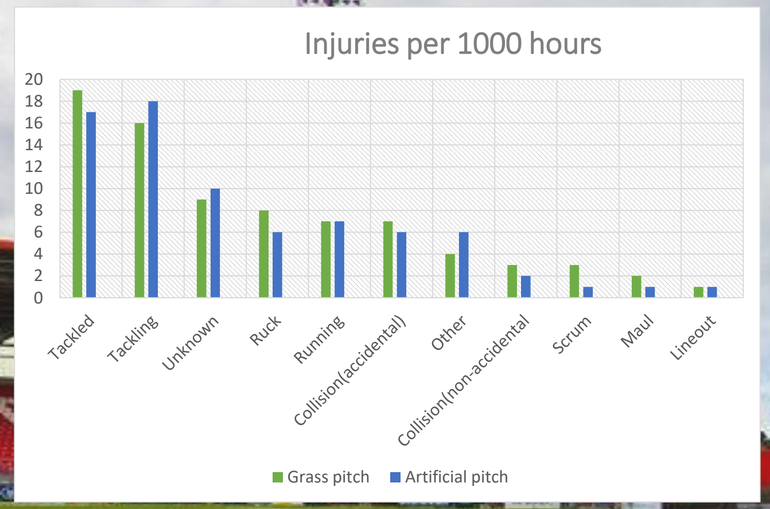
We categorized each injury under those headings, and created graphs to showcase our findings. We also created a graph to show the number of injuries that occurred on both pitches in 1000 hours to further prove our theory.

We used this data to compare the advantages and disadvantages of artificial pitches in comparison to grass pitches and if the advantages outweigh the injury risk of the artificial pitches.

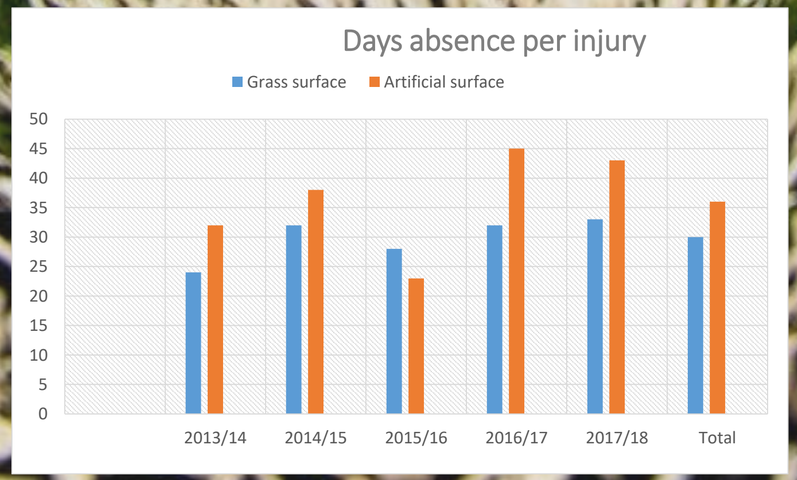
Advantages and disadvantages of artificial surface

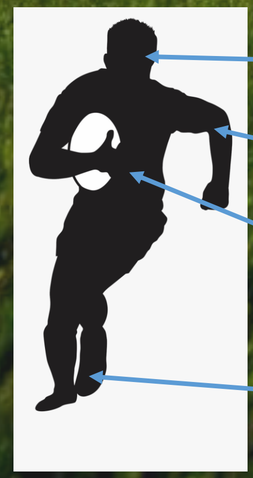
Advantages	Disadvantages
Multiple games played one after the other	Initial construction is expensive
Requires less maintenance	Players can get burns or cuts from playing on the pitch.
Played in all weather	Harder surface to run on.





	Number of injuries	Match Exposure in hours	Incidence number per 100 hours	Severity (days absent per injury)	Burden (days absent per 1000 hours)
Grass Turf	2646	32848	81	30	2433
Artificial surface	525	6800	77	39	3015





Head:
350 on grass pitches
450 on artificial pitches

Upper limb:
`500 on grass pitches
600 on artificial pitches

Trunk:
100 on grass pitches
70 on artificial pitches

Lower limb:
1600 on grass pitches
1200 on artificial

Conclusion

After a long analysis of the data we received we discovered:

- While both artificial and grass pitches both have similar amounts of injuries the severity of these injuries is a lot greater when playing on an artificial surface.
- The main difference is in upper and lower limb injuries which are the most common types of injuries rather than head and trunk.
- Injuries sustained while running and tackling increase on artificial surfaces while injuries sustained in rucks and while being tackled increase on grass pitches