The Den by Denny's

Anthony Brennan and Joshua Lehrberger

Problem Statement: Our goal of this project is to find out how to improve game/tournament performance.

Process: We first thought about how the tournaments were wide ranging in distance. We gathered the time zone and flight distance data from outside sources and looked at the effect of travel on tournaments. We ended up finding the exact travel days for each tournament and analyzed the problems associated with travel that would affect the games played. We proxied how well the teams did in each tournament by their spread (points scored-points scored against).

Slide 2: Information about the tournaments and travel

Tournament	Pre Tournament Arrival	Performance (Avg score diff)	Distance Traveled
Dubai	6	8.167	7300
Sydney	9	9.333	7776
Commonwealth (Gold Coast)	5	-1.400	7392
Kitakyushu	4	4.400	4535
Langford	NA	6.500	NA
Paris	4	0.000	4930
World Cup (San Francisco)	5	4.750	801

We found that sleeping hours were reduced on flight days. This led to increased levels of irritability for the players. Overall, fatigue and soreness dropped on flight days and slowly began returning to base levels, however many times they were not at base level before the tournaments and were significantly bad leading to poor performances. Given more time to recover before the tournaments would help to stabilize these numbers, improving performance.

Slide 3: We created a logistic model (on the left) to give coaches/managers an idea of how likely a player is to get injured, based on self reported data. We used the pain variable as the response variable with 0 = no pain, 1 = pain. We used some of the significant subjective ratings provided by the players. We also created a decision regression tree (on the right) to give coaches an easier to follow instructions on whether to cut a player's training load. (The higher the number the more likely a player is injured) If the decision tree goes to the left then the value is lower than preceding expression, whereas if the decision tree goes to the right then the value is greater than the preceding expression (higher numbers are better in this scenario).

Solution: We believe that if the team flies out earlier before a tournament (>5 days) then they will compete much better in their tournaments. One concern we had was that if the team is flying out earlier then it may put a strain on their budget. In order to combat this issue we looked into player safety costs, which we saw in the national insurance paid. We found that insurance can vary widely based on injury risk, so if the teams fly out earlier insurance costs should decrease.