

# Hot weather in Qatar can affect the European footballers at FIFA World Cup 2022

## Abstract

This study is the relationship between the climatic conditions predicted for the 2022 FIFA World Cup in Qatar and the capacity for repeated maximum effort of football players. The 2022 World Cup begins in November with 32 countries heading to Qatar to compete for football's biggest prize. But the real problem is most of the players from European countries and the biggest question is if they can withstand the humidity.

**Keywords:** climatic conditions, football players, humidity, FIFA world cup

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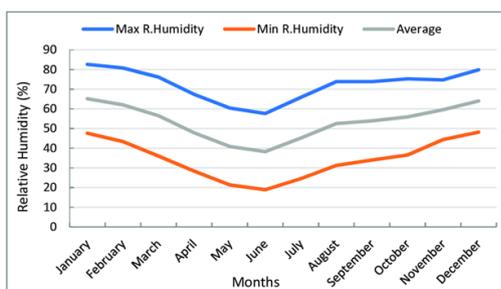
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## Introduction

Nowadays, soccer is more intensified than in the last decade.<sup>1</sup> Humidity is bigger issue than heat. Even in the shade the humidity will still affect the players. In humid conditions, player's body also sends more blood to circulate through their skin in an effort to cool it down, therefore sending less blood to muscles. This also increases your core temperature caused by running on the football pitch in general and makes breathing feel harder. During a soccer game, short-lasting movements are performed at maximum sprinting, jumping, sliding and high intensity counter attacking.<sup>2</sup> Such movements are characterized by an anaerobic energy metabolic process.<sup>1,3</sup> This clearly indicates the need to introduce training units in the training process taking into account the formation of the ability for short repeated maximal efforts. Despite the tournament taking part in the winter, a key focus for many of the squads arriving in Doha will be acclimatizing to the hot temperatures. England's football team will have to adapt to the conditions fast as they head to the Middle East after the Premier League comes to a halt a week before the opening game. With temperatures expected to play a big part through the tournament, what will the weather be like in Qatar difference to European weather conditions? Throughout the year in Qatar, the average temperature is around 29 degrees Celsius with highs in the summer months reaching 40 degrees. With the heat clearly too much in the summer, the World Cup is being played in the winter. However, compared to the European weather conditions, the temperatures will still be very high. The average temperatures in November and December in Qatar are 26 degrees Celsius and 21 degrees respectively. Comparing this to the European weather conditions, there are averages of 7-12 degrees in November and highs of nine in December. The two months in which the tournament takes place will also be some of the most humid months on average in Qatar (Figure 1).



**Figure 1** Average relative humidity in Qatar over a period of 10 years 2009-2019.

A relative average humidity of 71% in December is much higher than the annual average in the country of 59%. These numbers will be even higher within stadiums and to counteract this they have included state-of-the-art air conditioning inside grounds. Looking at the temperature data for Qatar it is easy to understand why the idea of moving football's World Cup in 2022 from summer to winter may prove irresistible. The summer months in Qatar are characterized by searing heat. The average high temperature in June in Doha is 41°C. As an average that means some days can be cooler than this but others hotter, with the hottest days known to reach 50C. But the problem in summer comes not just from the temperature but the combination of heat and humidity. Humid, moist air blowing inland from the sea combined with temperatures in the 40s is more difficult to endure than dry air blowing from the land. When it is hot our bodies attempt to cool through perspiration. Water evaporating from the surface of our skin removes heat from the body as it does so. When the air is humid that process doesn't work as well and as a result our bodies can overheat resulting in heat stroke. Temperatures are lower in the winter months. The average high temperature in Doha in November is 29°C falling to 24°C in December (Figure 2).

|               |    | Relative Humidity |     |     |     |     |     |     |     |     |
|---------------|----|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|
|               |    | 10%               | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% |
| Air Temp (°C) | 50 | 54                | 54  | 54  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 49 | 47                | 54  | 54  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 48 | 45                | 53  | 54  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 47 | 44                | 51  | 54  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 46 | 43                | 49  | 54  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 45 | 42                | 47  | 54  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 44 | 41                | 46  | 52  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 43 | 40                | 44  | 49  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 42 | 39                | 42  | 47  | 54  | 54  | 54  | 54  | 54  | 54  |
|               | 41 | 38                | 41  | 45  | 51  | 54  | 54  | 54  | 54  | 54  |
|               | 40 | 37                | 39  | 43  | 48  | 54  | 54  | 54  | 54  | 54  |
|               | 39 | 36                | 38  | 41  | 46  | 52  | 54  | 54  | 54  | 54  |
|               | 38 | 35                | 37  | 39  | 43  | 49  | 54  | 54  | 54  | 54  |
|               | 37 | 34                | 35  | 38  | 41  | 46  | 51  | 54  | 54  | 54  |
|               | 36 | 33                | 34  | 36  | 39  | 43  | 48  | 54  | 54  | 54  |
|               | 35 | 32                | 33  | 35  | 37  | 41  | 45  | 50  | 54  | 54  |
|               | 34 | 31                | 32  | 33  | 35  | 38  | 42  | 47  | 52  | 54  |
|               | 33 | 31                | 31  | 32  | 34  | 36  | 40  | 43  | 48  | 54  |
|               | 32 | 30                | 30  | 31  | 32  | 34  | 37  | 40  | 44  | 48  |
|               | 31 | 29                | 29  | 30  | 31  | 33  | 35  | 38  | 41  | 45  |
| 30            | 28 | 28                | 29  | 30  | 31  | 33  | 35  | 38  | 41  |     |
| 29            | 27 | 27                | 28  | 29  | 30  | 31  | 33  | 35  | 37  |     |
| 28            | 27 | 27                | 27  | 28  | 28  | 29  | 31  | 32  | 34  |     |
| 27            | 26 | 26                | 26  | 27  | 27  | 28  | 29  | 30  | 31  |     |
| 26            | 25 | 25                | 25  | 26  | 26  | 27  | 27  | 28  | 28  |     |

**Figure 2** Relative humidity and air temperature.

Again, as an average that means some days are hotter than this and temperatures in November have been known to reach as high as 38°C. Rain in Qatar is more likely in winter than summer and although this is unlikely to be significant there is the ever-present threat of sand storms. These can occur suddenly at any time of the year and the most severe can affect sporting activities. Recently a stage of the Tour of Oman cycle race had to be cancelled due to the combination of wind and heat. Kakamu et al.,<sup>4</sup> noted that acclimatization to heat can be critical in preventing heat illness, as it increases tolerance, adjusts the body's sweating mechanism such as the threshold body temperature for sweating, causes excessive sweating, and decreases the amount of

sodium lost through sweat. Given that the weather cannot be changed external and non-modifiable factor, heat preparedness efforts should focus on modifiable and internal personal factors e.g., acclimatization, hydration, nutrition, pre-cooling, as well as allowing breaks when needed and lowering temperatures in warm-up areas and lowering temperatures in competition areas.<sup>5</sup>

## Conclusion

It is better that the ambient temperature in which training sessions are conducted and matches played should be taken into account to predict the players' exercise capacity and adopt an appropriate playing strategy. Coaches and training staffs should be mindful of the players' greater ability in terms of power output at higher temperatures, while being mindful of the more rapid onset of fatigue and performance decline.

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## Conflicts of interest

The author declares that there are no conflicts of interest.

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