

LEVELLING THE PLAYING FIELD

ARE WE THERE YET?

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INTRODUCTION

A painting by the Ming Dynasty painter Du Jin shows women playing 'Cuju', which literally translated means 'kick-ball'. Cuju was an ancient Chinese football game and is considered one of the ancestors of modern football. Women were playing it as early as the Tang dynasty (618 – 907 AD), and possibly much earlier. There are some indications that women were trained to play professionally and were not just playing each other, but also playing against men. Unfortunately, Cuju slowly declined during the Ming dynasty (starting in 1368) and eventually died in the East.

If we fast forward to the 12th Century, we find several games like football being played in England, possibly influenced by similar games in the Roman Empire. The first Football Association was formed in London in 1863, and football became a very popular sport amongst both men and women, attracting large crowds. One women's match in 1920 was attended by 53 000 people, which was more than the men's FA Cup final in the same year.

NOW WE FAST FORWARD AGAIN TO 2023. WHERE DO WOMEN STAND TODAY?

Unfortunately, this is not the correct question. Given that we are talking about professional football, we must accept that



Image: Du Jin's painting shows women playing 'Cuju'. Cuju was an ancient Chinese football game and is considered one of the ancestors of modern football.

players are valued in monetary terms. So, the question we should really ask is: how much are female football players worth today?

It seems they are worth about 4% of their male counterparts – at least if you look at the FIFA World Cup. In the past 4 sets of World Cups (senior men's 2006, 2010, 2014, 2018,

followed by senior women's 2007, 2022, 2015, 2019) women received on average 4% of the prize money compared to men.

Even in the current set (men's in 2022, followed by the women's in 2023), whilst there is a significant increase, the number is still USD 60 million compared to USD 440 million (14%).



Figure 1: Women compared with men in terms of earnings and spectators per match.

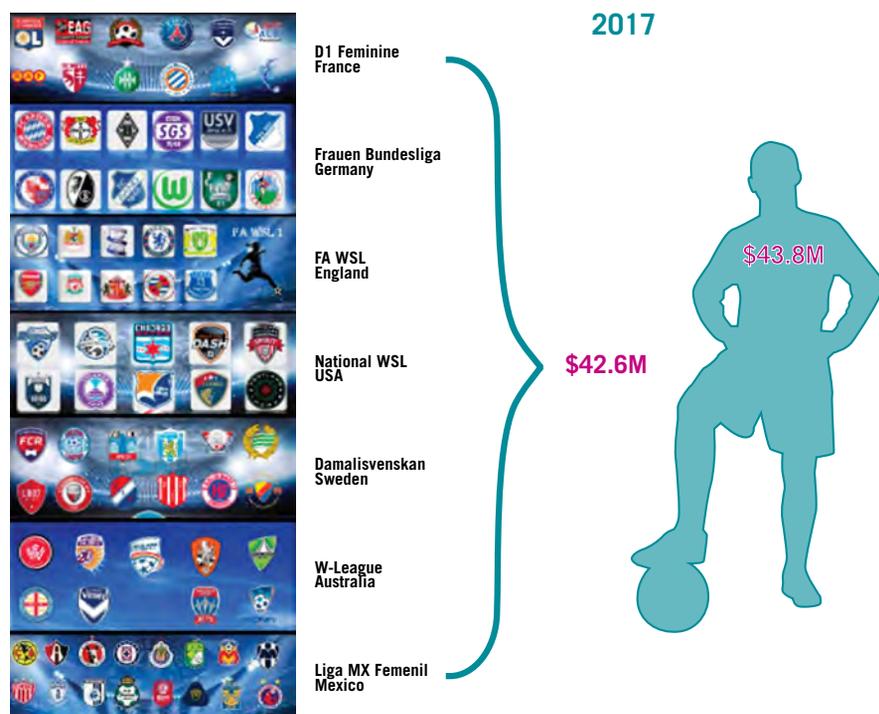


Figure 2: In 2017 one male footballer earned more than major women football leagues combined.

Some will say this is justified, since women's football is simply not as attractive as men's football. They will be correct. During the same 4 sets of FIFA World Cups since 2006 on average, the women's World Cup attracted slightly more than half the number of spectators compared to the men's World Cup.

But 50% is not 4%, or even 14%. This suggests female footballers are undervalued.

Perhaps if we look at a country where women's football is extremely popular, the picture will be different. In the USA, the women's team qualified for all eight of the Women's World Cups since 1991 and stood on the podium in each one of them. They were champions in four, runners-up in one and placed 3rd in three. The men's team, on the other hand, only qualified for 11 out of the 22 World Cups. Their best performance was in 1930 when they reached 3rd place. Since 1930 the best they had achieved was 8th place in 2002. You would expect to see this difference reflected in their prize money. Unfortunately, until very recently that wasn't the case. During the 2019 World Cup the women received USD 4 million for winning the tournament, while the men didn't qualify. However, if they had qualified, they would have received USD 8 million for losing in the first round. Domestically the women were paid USD 8,500 each for winning a friendly match, while the men were paid USD 8,100 each for losing a friendly match. The women were paid USD 750,000 for qualifying for the FIFA Women's World Cup 2018™, while the men would have been paid more than three times that much for the same achievement. The women took the US Soccer Federation to court, citing pay discrimination. The case was eventually settled with the result that the men's and women's national teams are now pooling their prize money before distributing it equally.

The pay gap is worse in Europe where in 2017 one male football player's annual salary at a major European club was more than the top seven Women's Football Leagues in Europe combined. Let's consider this for a moment: it means that one man was paid more than 1 639 of the best women in the world combined – for doing the same job. Unfortunately, not much has changed in the past 5 years. During the last UEFA Euro's championship, the women attracted more than a third of the number of spectators as

the men - yet were paid only 6% of what the men were paid. The Champions League is even worse, with the women attracting more than half of the number of spectators per match compared with the men and still received only about 1% of the pay.

We see a similar picture in broadcasting. For instance, a research project funded by the European Union (EU) and conducted by Nielsen in 2016 looked at five countries in the EU to get an idea of how much television time was spent on women's sports compared with men's sports. It seems as far as broadcasting is concerned, women are not valued very much, on average about 5% as much as men.

WHAT ABOUT TEAM SUPPORT?

We conducted a survey during the FIFA Women's World Cup in France. The aim of the study was to understand more about female players' knowledge, beliefs, and practices with regards to injury prevention. We also asked about their level of medical support during the year, particularly at club level where, unlike FIFA World Cups, medical support is not a formal requirement. The results were alarming: 33% did not have a dedicated physiotherapist in the club team, 40% did not have a team physician, almost 50% did not have a team sports scientist or strength and conditioning coach and 15% did not have any permanent medical staff in their domestic clubs. Another 3% reported no access to any medical facilities related to their club at all. This situation is unimaginable for the men's World Cup players.

The obvious question is: what happened between the Ming dynasty, or even the 19th century, and now? There are probably several explanations, but undoubtedly the FA ban on women's football played a major role. On 5 December 1921 the Football Association (FA), on the advice from their medical advisors, banned women from Association member's pitches, stating that "the game of football is quite unsuitable for females and ought not to be encouraged". This effectively banned their participation at club level. Other countries followed suit and instituted nationwide bans. This decision was a huge blow to women's football, just when both men and women's football started to flourish. At the same time women were being banned across the world, the first FIFA Men's World Cup was held in Uruguay. This was followed by 8 further world cups in the

Region	FWWC France 2019 (20 minute reach)	FWWC Canada 2015 (20 minute reach)	Diff.
Africa & Middle East	24.0m	12.0m	+100%
Asia	152.2m	141.8m	+7%
Europe	166.6m	70.5m	+136%
N.C. America & Caribbean	77.8m	83.8m	-7%
Oceania	2.3m	1.8m	+24%
South America	117.8m	17.9m	+560%
Global Total	540.6m	327.8m	+65%

Table 1: Consumption of TV coverage in different regions of the world. Source: <https://digitalhub.fifa.com/m/710ced814c13a263/original/u7uerxw2bejdsi8fsw-n-pdf.pdf>

next 50 years. Finally, in 1971, the FA lifted the ban, but it took another 20 years, and 5 further World Cups before FIFA held the first Women's World Cup in China in 1991.

Now, in the 21st Century, we are talking about correcting this wrong from the past and levelling the playing field again. At this point it may be worth considering why you, as the reader, should care about this issue. There are of course moral and ethical considerations about discrimination based on sex. But there is a more universally compelling reason: it is good business. There is no denying it: women's football is the future.

Football is the most popular sport in the world and FIFA has identified women's football as the single biggest opportunity for growth in football. The governing body is determined to double the number of women and girls playing in the next few years, to reach 60 million by 2026. As the popularity of women's football has grown, so has the attendance numbers. Some notable matches include: the FA Cup Final in 2022 (Chelsea vs Man City) - 49,094; the FIFA Women's World Cup final in 2019 (USA vs Netherlands) - 57,900 (and 80% of all TV viewers in the Netherlands watched this); the European Championships in 2022 (England vs Germany) - 87,000. And then there was the famous Champions League quarter final match in 2022 (Barcelona vs Real Madrid) with 91,553 spectators. These increases in spectator numbers

are accompanied by increases in viewer numbers. Since 2015, the FIFA Women's World Cup viewer numbers have increased 65% and is as high as 500% in some areas, such as South America.

It's tempting to suggest the playing field could be levelled by simply levelling the paying field - by paying women and men what they are worth. Unfortunately, it is not that simple. Men and women are not the same, and therefore, equality should not be confused with similarity.

Human males share 99.9% of their genome. However, men and women are genetically very different: both have 23 chromosome pairs, but men have an X and a Y chromosome, and women two X chromosomes. The total number of human genes are about 20 000, but the X chromosome carries more than 1000 genes and the Y less than 50, so there is a difference in the number of genes between men and women. Therefore, if you count the genes, men differ from other men by about 0.1% and it is now generally accepted that men differ from women by about 1%. In addition, it is not only about the number of genes. A study from the Weizmann Institute's Molecular Genetics Department in 2017 reveals that 6,500 genes are expressed differently in men and women, which means a third of all protein-coding genes in humans are different between men and women. To put it another way, sexual differences are not only found in the sexual

organs. Every cell in our bodies carry these genes, which means every cell in our bodies have a sex.

Scientists are starting to realise that the genetic make-up of the cell influence a wide variety of diseases and physiological processes, and this is independent of the hormonal environment. This particularly important because of issues like CYP3A. This enzyme is responsible for the metabolism of half of the medications we know. It turns out that because of these genetic differences, female livers have more of this enzyme than male livers. This means that for 50% of all medications, the dosage requirements for women and men may be quite different. Yet, can you recall the last time you saw a different dose for women and men on a medication label? Zolpidem is one rare example. In 2018, 20 years after initially approving the medication, the FDA recommended a lower dose for women. It was finally acknowledged that the blood levels of the medication were almost twice as high in women, compared to men and that women were more likely to be involved in a car accident the day after taking the medication, due to residual drowsiness.

SO, HOW DOES THIS RELATE TO SPORTS MEDICINE?

Men and women are also very different when it comes to musculoskeletal genes. The Weizmann Institute study looked at the number of genes expressed differently in each tissue in men and women. As can be expected, the breast tissue has the largest number of these genes, but surprisingly, the musculoskeletal system has the second highest number, suggesting men and women are very different from a

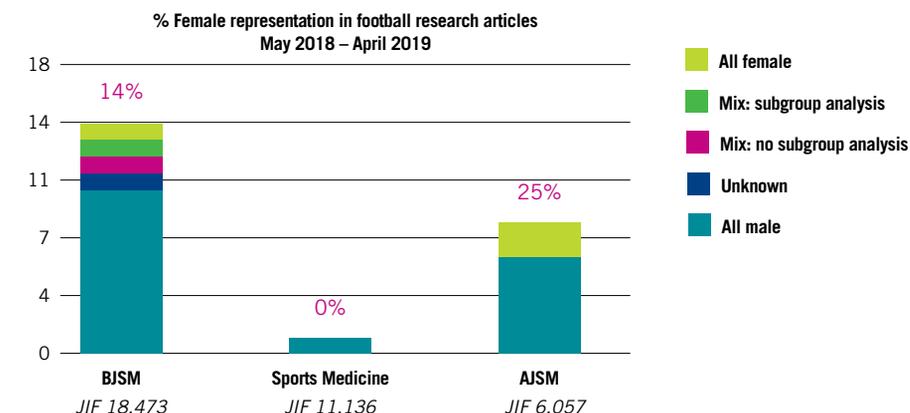


Figure 3: Percentage of female representation in football research articles in three sports medicine journals with the highest impact factor from May 2018 to April 2019.

musculoskeletal point of view. Our practical experience seems to confirm this. We know that the type and severity of injuries in women's football is different from that in men's football. For example, ACL rupture is between 2 and 6 times more common in female players and on average players are much younger when they have their first ACL injury, with the associated risk of early onset osteo-arthritis. We also know that women have more concussions than men and that when they are concussed, it is more severe, suggesting the pathological processes may be different.

Managing women's injuries therefore requires research with external validity – we can't just extrapolate the results from men and apply that to women. Unfortunately, this is where the playing field is still not level yet. A research article published in 2014 highlighted the fact that women are underrepresented in sports and exercise medicine research. A similar article published a year later found that sex-

specific analysis of data in five high impact orthopaedic journals only occurred in a third of all research papers. This phenomenon is not limited to sports medicine or orthopaedic research. The famous Baltimore Longitudinal study of ageing was commenced in 1958 and continues today. The main purpose of this study is to document the process of ageing. We now know that 85% of centenarians (those living to 100 years) and 94% of super-centenarians (those living to 110 years) are women. Yet, for the first 20 years, the authors only included men. In 2017, a group of researchers studied the pharmacodynamic effects between flibanserin (the female Viagra tablet) and alcohol. They enrolled 25 participants, of which 23 were men. We already know that women metabolise medications and alcohol at a different rate than men, and that this medication was designed for exclusive use in women. Therefore, the question must be asked: how useful is this research for the practicing physician?



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Illustration

The problem of external validity is experienced every day by doctors treating female football players. We performed a review of three sports medicine journals with the highest impact factors (British Journal of Sports Medicine, American Journal of Sports Medicine, and Sports Medicine) between May 2018 and April 2019. We wanted to know if you were a team doctor and looking for information on how to treat an injured female player, how useful these journals would be. The key question was how many original research projects in these sports medicine journals recruited female athletes and did a subgroup analysis to report if the findings were different in men and women. The results were disappointing: 34% of articles in the BJSM, 34% in the AJSM and only 18% in Sports Medicine reported a subgroup analysis of female athletes. If you were specifically looking for research on women's football, then the AJSM might have been your best bet, but still only 25% of articles would be useful. BJSM followed with 14% and there seemed to be no point consulting Sports Medicine – at least not if you were interested in original research.

This lack of appreciation for the differences between men and women is also seen in practice. Women play with the same ball as men. That means the same size, pressure, and material. There is very little research on the impact of changing

the ball size and weight on women's playing performance or injuries. However, a radiology study from 2018 demonstrates that women have more white matter micro-structural changes than men when heading the ball. We don't know yet what it means long term, but this may be an important factor in the incidence and severity of concussion, which we know is higher and more severe in women. The differences also involve the boot. There are major differences between men and women's feet: women have a narrower heel, a wider forefoot, higher arches, and wider hips, meaning they pressure-load the feet differently. Unfortunately, until recently up to 75% of women playing football at grassroots level were wearing either men's boots or children's boots. It is only in the last 3-4 years that some companies have started producing women's football boots. Ida sports is an Australian start-up company, who invested in designing women's boots. The main companies are now following, and a greater choice is now available, although still not as extensive as for men.

SO, ARE WE THERE YET?

Not quite. Levelling the playing field does not mean just increasing pay and prize money. In medicine we always say children are not just small adults. In the same way women are not just smaller men. They are

different. Hippocrates was a very wise man when he said, already more than 2000 years ago, *"It is far more important to know what person the disease has, than what disease the person has"*.

It is only once we know what person the football injury has, rather than what injury the footballer has, that we can start talking about levelling the playing field.

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