

# Format and schedule proposals for a FIFA World Cup with 12 four-team groups

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# Format and schedule proposals for a FIFA World Cup with 12 four-team groups

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**Abstract:** After the expansion of the FIFA World Cup from 32 to 48 teams starting from the 2026 edition, the initial proposal was to split the 48 national teams into 16 groups of three. Among other drawbacks, this proposal provides potential for collusion. Recently, after widespread criticism, FIFA officials signaled the possibility to re-discuss that proposal, pointing to a tournament with 12 groups of four teams. If this new proposal prevails, relevant questions arise about tournament design and schedule. In this paper, we propose tournament formats for a World Cup with 12 groups of four teams, considering a number of criteria, such as non-collusion, symmetry in rest days, no dead rubbers, and a tournament length of about one month. At the same time, our proposals attempt to adhere to the traditional format, with some nuances either in the group stage or in the knockout stage.

**Keywords:** FIFA World Cup, Round-robin, scheduling, soccer.

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\* The usual disclaimer applies.

# 1 Introduction

In January 2017, the FIFA Council decided to expand the FIFA World Cup (denoted by FWC henceforth) from 32 to a 48-team competition as of the 2026 edition. The initial proposal was to split the 48 national teams into 16 groups of three, such that the top two teams from each group advance to a single-elimination tournament starting from the last 32 and finishing with the final. This structure guaranteed important features such as a maximum of seven games for the teams reaching the final as was used in the previous World Cups and an overall length of the tournament of no more than 32 days.<sup>1</sup>

However, a group stage of three teams has a serious drawback of a possible collusion (Guyon, 2020). More specifically, in a group of three teams with two qualifiers, it is possible that in the last game, both teams would know the exact result they need for advancing to the knockout stage, possibly at the expense of a third team. A notable example is best known as the “Disgrace of Gijon”, which refers to a game between West Germany and Austria that took place in Gijon, Spain, during the 1982 FWC. In that game, a win by one or two goals for West Germany would qualify both teams at expense of Algeria. West Germany won 1:0, but both teams were accused of match-fixing because after the first goal was scored, none of them tried to change the result. Although FIFA decided that the teams did not break any rule, it also decided that starting from the 1986 FWC, the last two games of a group must take place simultaneously.<sup>2</sup>

Obviously, two simultaneous games within a group are not possible if the group consists of three teams. After much criticism regarding this three-team group structure and in light of a thrilling group stage of the 2022 FWC, the FIFA president Gianni Infantino pointed out that

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<sup>1</sup> For additional details, see <https://www.fifa.com/about-fifa/organisation/fifa-council/media-releases/fifa-council-unanimously-decides-on-expansion-of-the-fifa-world-cuptm--2863100>. Last accessed on 26/01/2023.

<sup>2</sup> It is also worth noting Kendall and Lenten (2017) who illustrated many examples where sports rules go awry.

FIFA should rediscuss the proposal for the next World Cup. In particular, his and other FIFA officials' statements signaled that the 2026 FWC might feature 12 groups of four instead of 16 groups of three teams.<sup>3</sup>

While this would allow mitigating the potential risk of collusion, it also opens the question of what should be the format and the schedule of the competition as to accommodate such 12 groups of four teams. An awkward complication arises from the fact that 12 is not a power of two. The progress of group winner and runner-up to the knockout stage would select 24 teams, thus the traditional single-elimination sequence would not arrive at two clear finalists, as it is now with the 16-team bracket. A straightforward option to fix this is to select eight best third-placed teams, which together with the two top teams of each group, would compete in a single-elimination tournament from a round of 32 until the final.

However, the large number of games associated with such a format might compromise other criteria such as the upper bound of seven games per team and the overall length of the tournament. All these obviously also raise environmental concerns.<sup>4</sup> In addition, as reported in the media, this format would split the 48 teams into two halves, and then each half would play according to the 24-team format used for the FWC between 1982 and 1994. Thus, the allocation of teams to groups would automatically dictate that many teams could never play against each other before a potential final, in contrast to the current format, where *a priori* every team has a chance to meet each other before the final.

The aim of our paper is to develop possible tournament formats and schedules for a FWC with 12 groups of four teams. It is important to note that allocating teams in the elimination stage of a tournament whose number of groups is not equal to a power of two might suffer from

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<sup>3</sup> For additional details, see <https://www.skysports.com/football/news/11095/12769221/gianni-infantino-fifa-to-launch-new-32-team-mens-club-world-cup-and-will-rediscuss-2026-world-cup-group-stage-format>. Last accessed on 26/01/2023.

<sup>4</sup> See Gammelsæter and Loland (2022) for discussion on the need of a greater compatibility between elite sport and environmental sustainability.

important issues such as arbitrariness and unbalanced pairings (Guyon, 2018). However, we do not aim to compare the efficacy of each format, but rather generate alternatives that would enhance FIFA's ability to feature a World Cup with 12 groups. To this aim, we design two alternative formats, which to our knowledge have not been used before in major football tournaments. In addition, we outline a schedule of games for each of these formats, attempting to meet important criteria such as minimizing the possibility for collusion, symmetry in rest days between the teams, no dead rubbers, length of the tournament below 32 days (which was the length of the 2018 FWC), and a reasonable number of games.

The first tournament format resembles the format used in beach volleyball where each team in the group of four teams plays only two games. The first round has a pre-determined allocation such that the highest pre-tournament rank in the group plays against the lowest rank, whereas another game features teams that are ranked second and third. In the second round of the group stage, the winners of the first round play against the losers of the first round.<sup>5</sup> The top two teams from each group qualify to the elimination stage. While the best eight winners of the group stage qualify directly to the last 16 stage, the remaining qualifying teams (four other group winners and 12 runners-up) play in the qualification stage. Then, the eight winners of this qualification stage advance to the last 16 stage, where they join the previously mentioned eight best winners of the group stage. From there, the tournament is the same single-elimination format used in all previous World Cups (starting from 1986).

The second format is based on the usual design where each team plays three games in the group stage and the top two teams qualify to the knockout stage of the tournament, pairing winners and runners-up from different groups to create a 24-team bracket. From there, it resembles the usual single-elimination structure, but as there would be 24 teams in the knockout

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<sup>5</sup> Note that each game in the group stage has to be determined. FIFA has already communicated that in case of a draw it considers penalty shootout to determine the identity of a winning team. See, <https://theathletic.com/3949146/2022/11/30/world-cup-group-shootouts/>. Last accessed on 26/01/2023.

stage, we need to make some adjustment before selecting two finalist teams. We make this adjustment right before the final, meaning that there will be stages of 24, 12, and six (instead of 16, eight, and four as it is in the current FWC format). After the three winners of the round of last six are known, the best winner qualifies directly to the final, whereas the other two play in an “extra semifinal”. The winner of this game qualifies to the final, while the loser is ranked third. Thus, this structure eliminates the need for the third-place game, which is widely considered unimportant.

This paper belongs to a large literature on tournament design of sports competitions that can be found in many academic fields such as economics, operational research, computer and sport sciences. Previous studies have investigated various issues related to tournament design such as collusion (Duggan & Levitt, 2002; Elaad et al., 2018; Guyon, 2018), incentives to lose (Csato, 2019; Csato, 2020a; Csato, 2020b; Csato, 2022; Dagaev & Sonin, 2018; Guyon, 2022; Haugen & Krumer, 2021; Krumer et al., 2023; Vong, 2017), scheduling (Alarcón et al., 2017; Durán et al., 2017; Goller & Krumer, 2020; Ermakov & Krumer, 2022; Krumer, 2020; Krumer et al., 2017a; Krumer & Lechner, 2017; Scoppa, 2015; Van Bulck et al., 2020; Van Bulck et al., 2019), optimal seeding (Cea et al., 2020; Guyon, 2015; Groh et al., 2012; Krumer et al., 2017b; Nissim & Sela, 2020; Sziklai et al., 2022), tie-breaking rules (Berker, 2014), number of prizes (Krumer et al., 2020), number of teams in the tournament (Di Mattia & Krumer, 2023), etc.<sup>6</sup>

This paper also relates to a growing literature on the 2026 FWC. For example, Guyon (2020) criticized the original FIFA’s proposal of groups of three teams and discussed some alternative formats to mitigate the risk of collusion. More recently, Krumer and Moreno-Ternero (2023) discussed the increase in the number of participating teams in the 2026 FWC

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<sup>6</sup> For additional references, see a recent book by Csató (2021).

and offered several ways to allocate the additional slots between the continents, arguing that the European football confederation (UEFA) has a solid basis to claim for additional slots.

The remainder of this paper is organized as follows. Section 2 presents tournament design criteria relevant to the FWC. Section 3 proposes alternative formats and outlines a detailed schedule for each of these formats. Section 4 discusses how these proposals satisfy the tournament design criteria. Section 5 concludes with some final remarks.

## **2 Criteria to satisfy**

### **2.1 Non-collusion**

As discussed in the introduction, one of the most critical points of the original FIFA's proposal was the potential for collusion implied by groups of three teams. In designing our proposals, we would like to create incentives for all teams to perform during all of their games. It is worthy to note that even in the current format of four teams per group, there might be situations in which these incentives become dubious. For example, in the third round of the group stage the 2010 FWC, the last minutes of the match between Germany and Ghana saw almost no action as the incumbent score of 1-0 in favour of Germany was likely to qualify both teams to the knockout stage (simultaneously, Australia was leading 2-1 against Serbia in the remaining game of this group, insufficient for both teams to overcome Ghana in the second place of the standings).

### **2.2 Rest days**

It is well-known in sports that too many games in short time periods may cause player fatigue and risk of injuries (Bengtsson et al., 2013; Dupont et al., 2010). FIFA's recommendation is that every team should have a minimum of three days off between consecutive matches. As for the maximum, although there is not a predefined guideline, in the

closest editions of the FWC the maximum resting period has spanned over six days, in the transition from the round of 16 to the quarterfinals.

As a fairness concern, the difference between two teams in their respective number of days off before their matchup has become an important criterion in the sports scheduling literature (Atan and Cavdaroglu, 2018; Durán et al., 2022; Goossens et al., 2020; Lambers et al., 2021; Van Bulck and Goossens, 2020). Empirical evidence by Scoppa (2015) has shown that a positive difference in rest days has a significant effect on the probability of winning when one of the team has rested three or less days, while if both teams have rested at least four days such a difference has no significant effect in the outcome of their game. In building our schedules, therefore, we impose that every team should rest at least three days between consecutive matches, and we try to avoid as much as possible an asymmetry when one of the teams has rested exactly three days.

### 2.3 Number of games in total

One of the concerns in raising the number of teams from 32 to 48 has been a potential increase in the number of games played in total during the tournament. This was perhaps one of the main reasons for FIFA to propose an event with 16 groups of three teams per group. With every team playing once against each of its group opponents, this original proposal would consist of 48 games in the group stage. Adding up to the 32 games planned for the knockout stage, this format would feature 80 games in total, 16 more than the 64 games played during the last seven editions. In general, more games require more days and more logistics resources from organizers and media, which may also raise environmental concerns, so it is a criterion to consider in the design and scheduling of the tournament.



## 2.4 Maximum number of games per team

In the current FWC format, the maximum number of games per team is equal to seven, played by each of the four teams that reach semifinals. The original proposal of FIFA for the 2022 edition also involves at most seven games per team. In spirit of this tradition and noticing that the calendar of games from domestic leagues and other international competitions is already demanding for the top players, a desirable feature of a new format would be to keep this maximum number of games per team at seven or at least to not modify it so drastically.

## 2.5 Minimum number of games per team

Part of the criticism received by FIFA's proposal of 16 groups of three has been that teams would play only two games in the group stage. In contrast, the current format guarantees that even those teams who do not progress to the knockout stage play a minimum of three games. Taking into account the large efforts from teams and fans preparing for the event, a quick elimination after only two games might become less acceptable than the three games secured by the current format. In a tournament with 12 groups of four teams, a single round robin within each group would imply 72 games during the group stage. Thus, securing three games per team involves a trade-off with the total number of games of the tournament. In finding a compromise, we believe that a feasible design for 2026 should either reduce the minimum number of games per team from three to two or keep the number of games at a minimum of three but followed by a smaller knockout stage in comparison to the original 32-team bracket proposed by FIFA.

## 2.6 No dead rubbers

From the attractiveness and competitiveness perspective, all games of the tournament should hopefully have something at stake. This is often the case in the current format of the FWC, although not always guaranteed, as the latter games of the group stage might become dead rubber given earlier results in the group (e.g. a third game between two opponents who

both lost their first two games). On other occasions the strongest team of a group would qualify already after winning its two first games, providing its third game's opponent with possibly higher chances of a good result than if their game was in the first or second round of the group stage (e.g. Brazil and France played with substitute players in their last group game in the 2022 FWC against Cameroon and Tunisia, respectively). A new format should, therefore, avoid the occurrence of dead rubber games (for one or both teams) or not increase their likelihood in comparison to the current format.

## 2.7 Fans travel planning

Over the years, FIFA has recognized the importance of fans' convenience. A popular product during the tickets' sale stages is the "Follow My Team" series, which ensures tickets for fans of a certain team wherever this team plays. When buying these tickets, the fans can specify whether they will follow their teams only during the group stage, or up to a certain round of the knockout stage. In the current format of the tournament, fans have certainty about the date and venue of the three group stage games, which enables them to make travel plans in advance. This is important, as the demand for accommodation and transportation around the dates and host cities of the event is very high. Planning for the knockout stage is subject to more uncertainty, as the qualification of each team depends on the performance realized during the group stage. Those teams that qualify as first and runner-up of a group follow different paths in the knockout stage. Normally, a template with placeholders and predefined venues is known in advance, which allows fans for some degree of anticipation regarding the cities and dates in which their teams will play if they keep progressing. An example illustrating how important is this for fans and teams relates to the 2023 Handball World Championship that took place in Poland and Sweden. In that tournament, the allocation of semifinal games to venues was not predefined in advance. Thus, right after some teams had won their quarterfinals, they still did

not know in which country they had to play their next game, a flaw which exposed the organization to criticism from coaches, players, and fans.<sup>7</sup>

## 2.8 Balanced brackets and diversity

The expansion from 24 to 32 teams introduced in 1998 has enabled the FWC to have a knockout stage bracket with *balance* and *diversity*. Here, balance means that each section of the bracket has the same number of group winners and runners-up, and diversity means that teams from the same group are not allocated to close sections within the bracket. In the current format, these features are reflected in a round of 16 where each half of the bracket contains four group winners matched with four group runners-up, all of them coming from eight different groups. This intrinsically facilitates diversity, so if two teams from the same group would have to face each other after the group stage, this would happen at the latest stages of the tournament (in the semifinals, as it was the case of Brazil and Turkey in the 2002 FWC, or after the semifinals, as it was the case of Croatia and Morocco vying for the third place in the 2022 FWC). A new tournament format should preserve some degree of balance and diversity, which is less straightforward to achieve in tournaments with a number of teams differing from a power of two (Csató, 2021). Note that these criteria might involve a trade-off with the symmetry of resting days of opponent teams, as teams from different groups might finish their group games on different days.

## 2.9 Number of days without games

FWC, whose 2018 edition was viewed by 3.57 billion viewers around the globe, is undoubtedly one of a few mega-events that may attract such a huge audience.<sup>8</sup> Thus, it is likely

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<sup>7</sup> For additional details, see <https://www.nrk.no/sport/norge-vant-gruppefinalen-mot-tyskland--moter-spania-i-kvartfinalen-1.16268421> (in Norwegian). Last accessed on 26/01/2023.

<sup>8</sup> For additional details see, <https://www.fifa.com/worldcup/news/more-than-half-the-world-watched-record-breaking-2018-world-cup>. Last accessed on 26/01/2023.

that FIFA authorities would like to minimize the number of days without games. For example, in the 2022 FIFA World Cup, there were six days without games, whereas in the 2018 FIFA World Cup, there were seven such days.

### **3 Proposed formats with 12 four-team groups**

#### **3.1 Two games in group stage and 16-team bracket in the elimination stage (G2B16)**

In Table 1, we offer a possible schedule for the structure of 12 groups with four teams, where each team plays only twice in the group stage. Such a structure is widely used in beach volleyball starting from 2017.<sup>9</sup> Note that groups A-F are on one side of the bracket, whereas groups G-L are on the other side. This means that, to satisfy the minimal rest days criteria and in order to minimize asymmetry in rest days, a team on the one side of the bracket can meet a team from the other side of the bracket only in the final.

In the first round of the group stage, the highest ranked team of each group (e.g. A1) plays against the lowest ranked team of the group (e.g. A4). The two remaining teams (e.g. A2 and A3) play in the second game. This resembles the pairings in beach volleyball; however, it can also be that A1 plays against A3, and A2 plays against A4. Different matchings may result in different probabilities of winnings and exerted efforts (Groh et al., 2012). At this point, we leave it to the future research to investigate the optimal matching in the first round. Note that for simplicity, we schedule the games of the top and the bottom teams at 13:00 and 19:00, but this can also be changed. In addition, given a variety of time zones at the 2026 FIFA World Cup, we refer to the offered time zones as generic rather than actual zones of each host city.

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<sup>9</sup> See for example <http://www.bvbinfo.com/Tournament.asp?ID=3288&Process=Pool>. Last accessed on 26/01/2023.

Table 1: Schedule of a tournament with 2 games per team in the group stage and a 16-team bracket (G2B16 format)

<b>Round 1 of the group stage</b>				
Day	13:00	16:00	19:00	22:00
1	A1-A4	A2-A3	B1-B4	B2-B3
2	C1-C4	C2-C3	D1-D4	D2-D3
3	E1-E4	E2-E3	F1-F4	F2-F3
4	G1-G4	G2-G3	H1-H4	H2-H3
5	I1-I4	I2-I3	J1-J4	J2-J3
6	K1-K4	K2-K3	L1-L4	L2-L3
<b>Round 2 of the group stage</b>				
Day	14:00	18:00	22:00	
7	Winner A- Loser A Winner A-Loser A	Winner B- Loser B Winner B-Loser B	Winner C- Loser C Winner C-Loser C	
8	Winner D- Loser D Winner D-Loser D	Winner E- Loser E Winner E-Loser E	Winner F- Loser F Winner F-Loser F	
9	Winner G- Loser G Winner G-Loser G	Winner H- Loser H Winner H-Loser H	Winner I- Loser I Winner I-Loser I	
10	Winner J- Loser J Winner J-Loser J	Winner K- Loser K Winner K-Loser K	Winner L- Loser L Winner L-Loser L	
11	<b>Rest Day</b>			
<b>Qualification stage</b>				
Day	17:00		21:00	
12	Team (A-F)-Team (A-F)		Team (A-F)-Team (A-F)	
13	Team (A-F)-Team (A-F)		Team (A-F)-Team (A-F)	
14	Team (G-L)-Team (G-L)		Team (G-L)-Team (G-L)	
15	Team (G-L)-Team (G-L)		Team (G-L)-Team (G-L)	
<b>Last 16 stage</b>				
Day	17:00		21:00	
16	Group Winner (A-F)-Winner Day 12		Group Winner (A-F)-Winner Day 12	
17	Group Winner (A-F)-Winner Day 13		Group Winner (A-F)-Winner Day 13	
18	Group Winner (G-L)- Winner Day 14		Group Winner (G-L)- Winner Day 14	
19	Group Winner (G-L)- Winner Day 15		Group Winner (G-L)- Winner Day 15	
20	<b>Rest Day</b>			
21	<b>Rest Day</b>			
<b>Quarterfinals</b>				
Day	17:00		21:00	
22	Winner Day 16- Winner Day 16		Winner Day 17- Winner Day 17	
23	Winner Day 18- Winner Day 18		Winner Day 19- Winner Day 19	
24	<b>Rest Day</b>			
25	<b>Rest Day</b>			
<b>Semifinals</b>				
Day	21:00			
26	Winner Day 22- Winner Day 22			
27	Winner Day 23- Winner Day 23			
28	<b>Rest Day</b>			
29	<b>Rest Day</b>			
<b>Third place play-off</b>				
Day	18:00			
30	Loser Day 26- Loser Day 27			
<b>Final</b>				
Day	19:00			
31	Winner Day 26- Winner Day 27			

We propose four games per day at four different time slots, which resembles the structure of the first two rounds of the group stage of the 2022 FWC.

In the second round of the group stage, the winners of the first round play against the losers. There are two advantages of such a structure compared to the case where winners play against each other and losers play against each other as well.<sup>10</sup> The first is that all the teams have incentives to win in the first round. If, however, winners play against winners, one team may strategically lose its first game in order to play the next game against a weaker team with a high chance to improve its goal difference and qualify to the next stage. If, however, winners play against losers, we eliminate the incentives to lose in the first game. In addition, all the teams have always theoretical chance to qualify to the next stage, therefore such a structure eliminates dead rubbers. Following a tradition that started in the 1986 FWC, both games of the final round of each group will take place at the same time. The reason behind such simultaneous games is to eliminate possible collusion a-la “Disgrace of Gijon”. In the second round of the group stage, we offer three time slots per day with a difference of four hours between them. Such a four-hour difference was also used in the third round of the group stage of the last three World Cups.

The top two ranked teams from each group qualify from the group stage, whereas the bottom two teams in each group are eliminated. This means that 24 teams continue in the tournament. However, for the smooth elimination structure, the number of teams should equal a power of two, which is not the case with 24 teams. Thus, the best eight winners of the groups will qualify directly to the last 16 stage, whereas the other 16 teams (four other group winners and all the runners-up) will have to play one game in a *qualification stage* (the four winners

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<sup>10</sup> Note that in the second round of the beach volleyball tournaments, the winners of the first round play against each other (and obviously the losers play against each other as well). However, unlike in the FWC, in beach volleyball the top three teams qualify from the group.

will not play against each other).<sup>11</sup> It is important to note that the best eight winners will have a relatively large rest time of at most ten days. However, it is very similar to the case of Ukraine at the UEFA Euro 2020 that had eight days of rest between its last game in the group stage and the game in the last 16 stage.

To rule out the possible overlap between the games in the qualification stage, due to the possible overtime and penalty shootouts, we offer three time slots per day with a difference of four hours between them. A four-hour difference was also used in the previous World Cups' eliminations stages.

Starting from the last 16 stage, the schedule follows the same pattern that was used in previous World Cups. More specifically, there will be two games per day with a four-hour difference between them in the last 16 and quarterfinal stages with two rest days between the stages. Finally, two semifinals will be played on days 26-27. The third-place play-off will take place on day 30. This is the only game in this proposal with asymmetry in rest days between the two teams, such that one team will have only three days of rest, which according to Scoppa (2015) may negatively affect its win probability. However, a similar schedule was also used in the previous World Cups. The last game of the tournament, the final, will take place on day 31.

### 3.2 Three games in group stage and 24-team bracket in the elimination stage (G3B24)

The idea of this format is to resemble the traditional format during the group stage and the knockout stage, but introducing an extra round before the final. First, a single round-robin is played within each of the 12 groups, that is, every team plays once against each of its three group opponents. The top two ranked teams from each group qualify from the group stage,

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<sup>11</sup> The ranking of the teams will be made based on well-accepted criteria such as the number of points, followed by the goal-difference, then the number of scored goals, lower disciplinary points, and finally drawing of lots.

whereas the bottom two teams in each group are eliminated. The qualified teams are paired in such a way that the winner and runner-up of one group play against the runner-up and winner of another group, respectively (A1 vs B2, A2 vs B1, ..., K2 vs L1). In this round of 24, the paired teams play a single-elimination game as usual, thus resembling the round of 16 of the traditional format, but instead of eight games played by 16 teams, there are 12 games played by 24 teams. If the game is tied, there is extra time and if the tie persists, there is a penalty shootout definition as usual. The 12 winning teams progress to the second round of the knockout stage, which will feature six single-elimination games. The partition of the 12 teams into six pairs can be easily done beforehand to secure group diversity. The six winners then progress to the third round of the knockout stage, which will feature three games.

This format so far follows the same principles of the traditional format, with a group stage in which every team plays three games and a knockout stage whose rounds of 24, 12, and six resemble the traditional round of 16, quarterfinals, and semifinals. However, after the third round of the knockout stage there would be three winners instead of two. Among these three, the *best* winner would progress directly to the final, while the other two teams would play an extra semifinal game. The winner of this game would qualify to the final, while the loser would end up ranked in the third place of the competition.

The selection of the best winner after the third round of the knockout stage should be based on pre-defined criteria. For example, a ranking could add up the points achieved by the winning teams in both the group stage and the knockout stage, and other usual tiebreakers may apply if needed. Note that this might even increase incentives to perform throughout the whole group stage, including the third group game for those teams who already secured their progress to the knockout stage after only two games.

Table 2 outlines the schedule for this tournament format, which consists of 95 games.



Table 2: Schedule of a tournament with 3 games per team in the group stage and a 24-team bracket (G3B24 format)

<b>Round 1 of the group stage</b>						
Day	12:00	14:00	16:00	18:00	20:00	22:00
1	A1-A2	A3-A4	B1-B2	B3-B4	C1-C2	C3-C4
2	D1-D2	D3-D4	E1-E2	E3-E4	F1-F2	F3-F4
3	G1-G2	G3-G4	H1-H2	H3-H4	I1-I2	I3-I4
4	J1-J2	J3-J4	K1-K2	K3-K4	L1-L2	L3-L4
<b>Round 2 of the group stage</b>						
Day	12:00	14:00	16:00	18:00	20:00	22:00
5	A1-A3	A2-A4	B1-B3	B2-B4	C1-C3	C2-C4
6	D1-D3	D2-D4	E1-E3	E2-E4	F1-F3	F2-F4
7	G1-G3	G2-G4	H1-H3	H2-H4	I1-I3	I2-I4
8	J1-J3	J2-J4	K1-K3	K2-K4	L1-L3	L2-L4
<b>Round 3 of the group stage</b>						
Day	14:00		18:00		21:00	
9	A1-A4	A2-A3	B1-B4	B2-B3	C1-C4	C2-C3
10	D1-D4	D2-D3	E1-E4	E2-E3	F1-F4	F2-F3
11	G1-G4	G2-G3	H1-H4	H2-H3	I1-I4	I2-I3
12	J1-J4	J2-J3	K1-K4	K2-K3	L1-L4	L2-L3
13	<b>Rest day</b>					
<b>Last 24 stage</b>						
Day	13:00		16:00		19:00	
14	73: 1A-2B		74: 1C-2D		75: 1B-2A	
15	77: 1E-2F		78: 1G-2H		79: 1F-2E	
16	81: 1I-2J		82: 1K-2L		83: 1J-2I	
17	<b>Rest day</b>					
18	<b>Rest day</b>					
<b>Last 12 stage</b>						
Day	14:00		18:00		22:00	
19	85: W73-W74		86: W75-W76		87: W77-W78	
20	88: W79-W80		89: W81-W82		90: W83-W84	
21	<b>Rest day</b>					
22	<b>Rest day</b>					
23	<b>Rest day</b>					
<b>Last 6 stage</b>						
Day	14:00		18:00		22:00	
24	91: W85-W86		92: W87-W88		93: W89-W90	
25	<b>Rest day</b>					
26	<b>Rest day</b>					
<b>Semifinal</b>						
Day	21:00					
27	94: 2W91/92/93-3W91/92/93					
28	<b>Rest day</b>					
29	<b>Rest day</b>					
30	<b>Rest day</b>					
<b>Final</b>						
Day	19:00					
31	1W91/92/93-W94					

As shown in this schedule, it is possible to spread these games into 31 days, while still satisfying Scoppa's (2015) condition of non-asymmetry in the rest days. Also, a side effect of this format is avoiding the need for a third-place play-off, often regarded as the game nobody wants to play.

While this format matches the number of teams to a power of two right before the final, one could make this adjustment at any round of the knockout stage. An alternative, for example, is to rank the 12 winners of the round of 24 and promote the best four winners directly to the quarterfinals, while the remaining eight winners are paired into four games in a "pre-quarterfinals" round. The four winners of this round would be matched with the four previously selected best winners, and then the knockout stage would keep progressing with the traditional quarterfinals, semifinals, final and third place play-off as usual. We have verified for this alternative it is still possible to produce a schedule of games spanning about one month. However, since the ranking of 12 best winners is unknown *a priori*, it becomes more complicated to provide diversity in the knockout stage (in particular, the pairing of teams in the pre-quarterfinals and in the following round requires some special care to not mix teams from the same group, affecting the possibility to anticipate the paths that teams would follow to a potential final). We may also conceive hybrid formats, based on a combination of the formats presented in the previous sub-sections, where each team would play two games in the group stage, a-la beach volleyball, followed by a knockout stage with a 24-team bracket.

## **4 Discussion**

We focus our discussion on the criteria satisfaction met by the proposed formats. A summary is presented in Table 3, where we also include how these criteria have been met in the latest two FWC tournaments. As for the non-collusion principle, our proposals improve considerably upon the risk conveyed by the current FIFA's proposal of 16 groups of three teams. They also improve upon the "2x24" format (two parallel halves of 24 teams, with a group stage of three games per group and a 32-team bracket knockout stage). In fact, the G2B16

(two group games with 16 teams in the first elimination stage) format creates clear incentives to perform for all teams at all moments of the competition, including the two group games where there must always be a winner (which in turn eliminates the chances of dead rubber games). As for the G3B24 (three group games with 24 teams in the first elimination stage) format, although it features a group stage identical to the traditional case, the incentives to win all games are slightly stronger, as the points collected in every game may become decisive to qualify directly to the final after the round of last six. This might also help reducing chances of dead rubber games, although these persist when two teams lose their first two games and meet each other in the third round of the group stage.

Recall that the two latest editions were played by 32 instead of 48 teams. Therefore, it should not be so surprising that the formats we propose increase the number of games. The increase amounts to a moderate eight additional games in case of the G2B16 format. In the case of the G3B24 format, the increase in the number of games is 31 games. On its hand, if FIFA was to implement the “2x24” format, the number of games would be 104, thus the additional number of games by our proposals appear acceptable. Furthermore, despite the additional number of games, the length in days of our schedules equals 31 days, which fits well between the 29 and 32 days used for the latest two FWC editions. A slight difference is that we do not set apart a kick-off day for the first game of the tournament as it has been done in the recent editions, but even doing so would keep the length of our schedules at the 32 days used by the 2018 FWC Russia.

A positive feature of the G2B16 format is to keep the maximum number of games per team to seven, in line with the tradition of the FWC. The G3B24 format increases this number to eight for one of the finalists, in particular for the team that wins the extra semifinal. These eight games would be unavoidable also if FIFA would implement the format of three games per group followed by a 32-team bracket. Keeping the maximum number of games at seven in the G2B16 proposal comes at the expense of guaranteeing every team only two instead of three

games during the group stage, which is also the case in FIFA’s original proposal of 16 groups of three teams. While our G3B24 recovers the traditional three games per group, it is clear that there is a trade-off between securing this lower bound and not increasing the total number of games of the tournament.

*Table 3: Comparison of criteria satisfaction between different formats*

	FWC Russia 2018	FWC Qatar 2022	G2B16 proposal	G3B24 proposal
Non-collusion	✓	✓	✓	✓
No dead rubbers	X	X	✓	✓
Total number of games	64	64	72	95
Length of tournament in days	32	29	31	31
Max number of games per team	7	7	7	8
Min number of games per team	3	3	2	3
Max number of rest days	6	6	10	7
Min number of rest days	3	3	3	3
Asymmetry in rest days below 4 days of rest	Only in the third-place game	Only in the third-place game	Only in the third-place game	none
Number of days without games	7	6	7	11
Fans travel planning in the group stage	✓	✓	X	✓
Number of simultaneous games	16 (8 time slots)	16 (8 time slots)	24 (12 time slots)	24 (12 time slots)
Bracket balance	✓	✓	some games 1 vs 2 some games 2 vs 2	✓
Bracket diversity	✓	✓	X	✓

About the number of rest days, all formats and schedules respect the minimum of three days between consecutive games for every team. The maximum number of rest days, however, is larger in our schedules, ranging from seven to 11, in comparison to the maximum of six rest days experienced in 2018 and 2022. In addition to the larger number of teams in the coming FWC compared to the previous two editions, the main reason for this increase is that we construct our schedules taking care of not violating the asymmetry condition derived from Scoppa’s (2015) empirical study. As a consequence, the number of days without a game is also larger in our schedules than in the last two FWC’s.

Fans' experience and travel planning are plausibly better in the formats that secure all teams a minimum of three games, namely the G3B24 and "2x24" formats. As in these formats the identity of teams of the group games and the corresponding venues and dates can be assigned well in advance, it is easier for fans to plan their journeys. The G2B16 is subject to more uncertainty, since only the first game of the group stage would be known with certainty beforehand. Yet, to mitigate this issue all games of the same group could be hosted by cities nearby, which could enable fans to base themselves in a regional cluster and attend the games traveling relatively shorter distances. In fact, for the 2026 edition, the 16 host cities have been grouped by FIFA into three clusters: West, Central, and East. It is also likely that the 2030 edition will follow a similar pattern, as some of the candidate bids under discussion involve multiple host countries.

Our proposals increase the number of simultaneous games from 16 to 24, but this is simply a consequence of having 12 groups instead of eight. Thus, we would expect any proposal with 12 groups of teams to involve 12 time slots with two simultaneous games each, as to preserve excitement in the group outcomes and to avoid match fixing.

A positive feature of the G3B24 format is that it enables balance and diversity without the necessity of ranking the teams who qualify to the knockout stage. This feature enables some degree of anticipation on the path that teams from a given group would follow until a potential final, without them depending on the performance of its peers from other groups but just before the final. In contrast, the selection of four best winners and the qualification stage in the G2B16 format reduce the chances to secure balance. Nevertheless, the hypothetical "2x24" format would also suffer in this respect, as some of the group winners would play against best third teams and others against runners-up.

## 5 Conclusion

This paper was motivated by the willingness of FIFA to re-discuss its decision regarding the format of the 2026 FWC, where instead of the original proposal of 16 groups of three teams there might be 12 groups of four teams. We have elaborated two possible formats for the 12 groups alternative, together with a detailed schedule for each of these formats. These formats and schedules provide much clearer incentives for teams to perform and reduce the possibilities of collusion in comparison to the original FIFA's proposal of 16 groups with three teams. Moreover, we have discussed how these tournament formats and schedules meet a number of other criteria relevant to the competition. Notably, the total number of games in our proposals range from 72 to 95, considerably lower than the hypothetical (and undesirably high) 104 games that result from a straightforward doubling of the old FWC's format with 24 teams. Also, our schedules have shown that the length of the competition can be kept at about one month, similarly as in recent tournaments. In general, we foresee our proposals may become a viable option for the coming FWC editions, adapting to the disruptive increase from 32 to 48 teams while retaining a great share of the most traditional features of the event.

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