



VOLLEYBALL
WORLD
RANKING
FOR SENIOR
NATIONAL
TEAMS

HOW IT WORKS

MATCHES COUNTING TOWARDS THE WORLD RANKING

All matches played by 222 senior national teams in FIVB official competitions, Olympic Games, Continental Championships, annual Continental, Zonal and Recognized Volleyball Associations events with a minimum of 4 participating teams.

METHODOLOGY

To calculate the World Ranking, the following is considered:

- The World Ranking score (WR score) reflects the current sporting strength of a team and its position in the ranking.
- Before each match, the WR scores of the 2 teams are compared. The team with the highest score is identified as the strongest team in this match and is therefore expected to perform better than its opponent.
- Based on both teams' score and historical match data, the algorithm will calculate the probabilities of all 6 outcomes of the match: 3-0 / 3-1 / 3-2 / 2-3 / 1-3 and 0-3. The actual result of the match is then compared with the expected results, previously calculated.
- If the team over-performed and exceeded expectations, the team scores World Ranking points (WR points). If the team under-performed, the team loses WR points. The same amount of points won by one team is lost by the other.
- The closer the actual match result is to the most expected outcome, the smaller the number of WR points will be won and lost. The further the actual match result is to the most expected outcome the greater the number of WR points will be won and lost.

FORMULA

Definition

Probabilities of 3-0 / 3-1 / 3-2 / 2-3 / 1-3 / 0-3	P1 / P2 / P3 / P4 / P5 / P6
Normal distribution with average 0 and standard deviation 1	$\sim N(0,1)$
Strength difference between the teams	Δ
Standard scaling factor	8
Teams World Ranking scores	WRS1 / WRS2
The cut-points in the normal distribution that represent the average outcome of a match between two equal strength opponents derived from the actual match results of the past decade	C1 / C2 / C3 / C4 / C5
Expected Match Result	EMR
Set Score Variant	SSV
Match Weight Factor	MWF

Calculation

$$\Delta = 8 * (WRS1 - WRS2) / 1000$$

Probability of	3 - 0	result = $\sim N(0,1)(C1 + \Delta) = P1$
Probability of	3 - 1	result = $\sim N(0,1)(C2 + \Delta) - \sim N(0,1)(C1 + \Delta) = P2$
Probability of	3 - 2	result = $\sim N(0,1)(C3 + \Delta) - \sim N(0,1)(C2 + \Delta) = P3$
Probability of	2 - 3	result = $\sim N(0,1)(C4 + \Delta) - \sim N(0,1)(C3 + \Delta) = P4$
Probability of	1 - 3	result = $\sim N(0,1)(C5 + \Delta) - \sim N(0,1)(C4 + \Delta) = P5$
Probability of	0 - 3	result = $1 - \sim N(0,1)(C5 + \Delta) = P6$

Match Result	Set Score Variant	Probability
3-0	+2	P ₁
3-1	+1.5	P ₂
3-2	+1	P ₃
2-3	-1	P ₄
1-3	-1.5	P ₅
0-3	-2	P ₆

$$EMR = P_1 * (+2) + P_2 * (+1.5) + P_3 * +1 + P_4 * (-1) + P_5 * (-1.5) + P_6 * (-2)$$

Match Weight Factors are given to different competitions to reflect the prestige of the tournaments.

Organizer	Event	Match Weight Factor
IOC	Olympic Games	50
FIVB	World Cup	50
FIVB	Volleyball Nations League	40
Continental Confederations	Continental Championship	40
Continental Confederations	Annual Continental Events	30
Zonal & Recognized Volleyball Associations	Annual Zonal & Recognized Volleyball Associations Events	20

The difference between the actual result (set score variant) and the expected match result gives the WR value.

$$SSV - EMR = WR \text{ value}$$

The WR value is then multiplied by the Match Weight Factor of the event and divided by the standard scaling factor to get the WR points.

$$WR \text{ value} * MWF / 8 = WR \text{ points}$$

The same amount of WR points won by one team is lost by the other.