Does Home Field Advantage In Soccer Still Exist?

PREMIER LEAGUE RESEARCH

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Did home advantage in the Premier League shrink in 2020-21, the season played almost entirely without fans?

What We're Studying

- We compare home advantage across Premier League seasons from 2015-16 to 2025-26
- Home advantage is measured by goals, match results, fouls, and yellow cards
- We focus on 2020-21, the season played almost entirely without fans

Why this Topic?

- We're all passionate about sports.
- The Premier League is widely regarded as the most competitive league in the world.
- 2020-21 gives us a rare angle: with stadiums almost empty, we can ask whether crowds drive home advantage.

The Data

Source

- football-data.co.uk, via the datasets/football-datasets GitHub repository

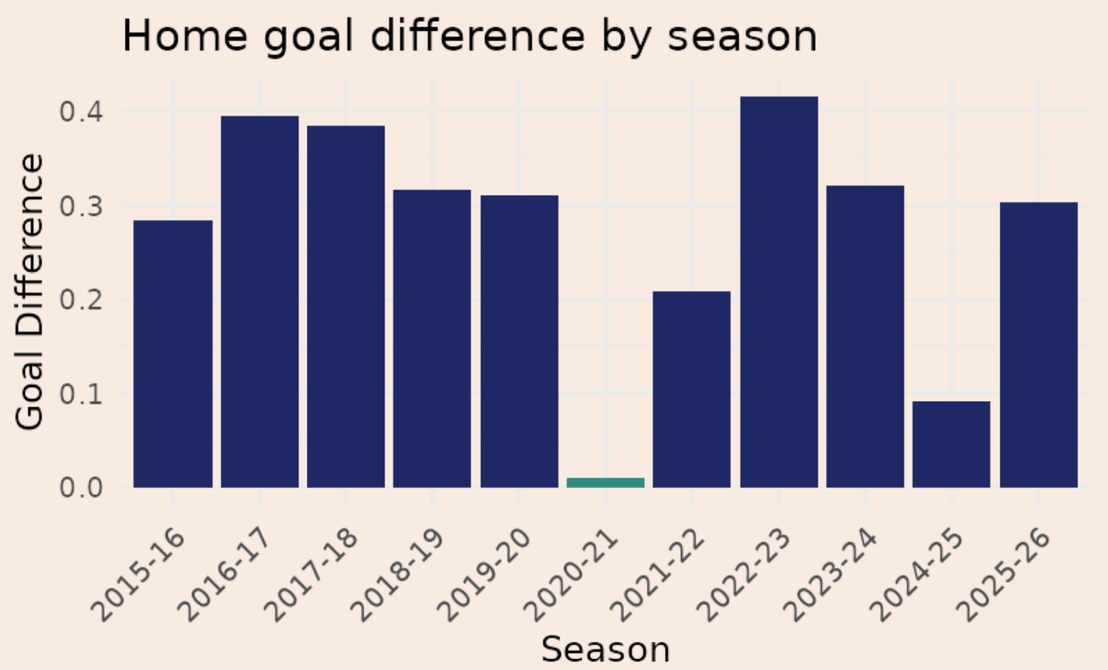
Coverage

- Every Premier League match from 2015-16 to 2025-26: 4,180 matches across 11 seasons.
- Each row is one match.

Variables & Limitation

- Season, goals, fouls and yellow cards for home and away teams.
- No attendance data, so 2020-21 is treated as the season without fans.

Home goal advantage nearly vanished in 2020-21



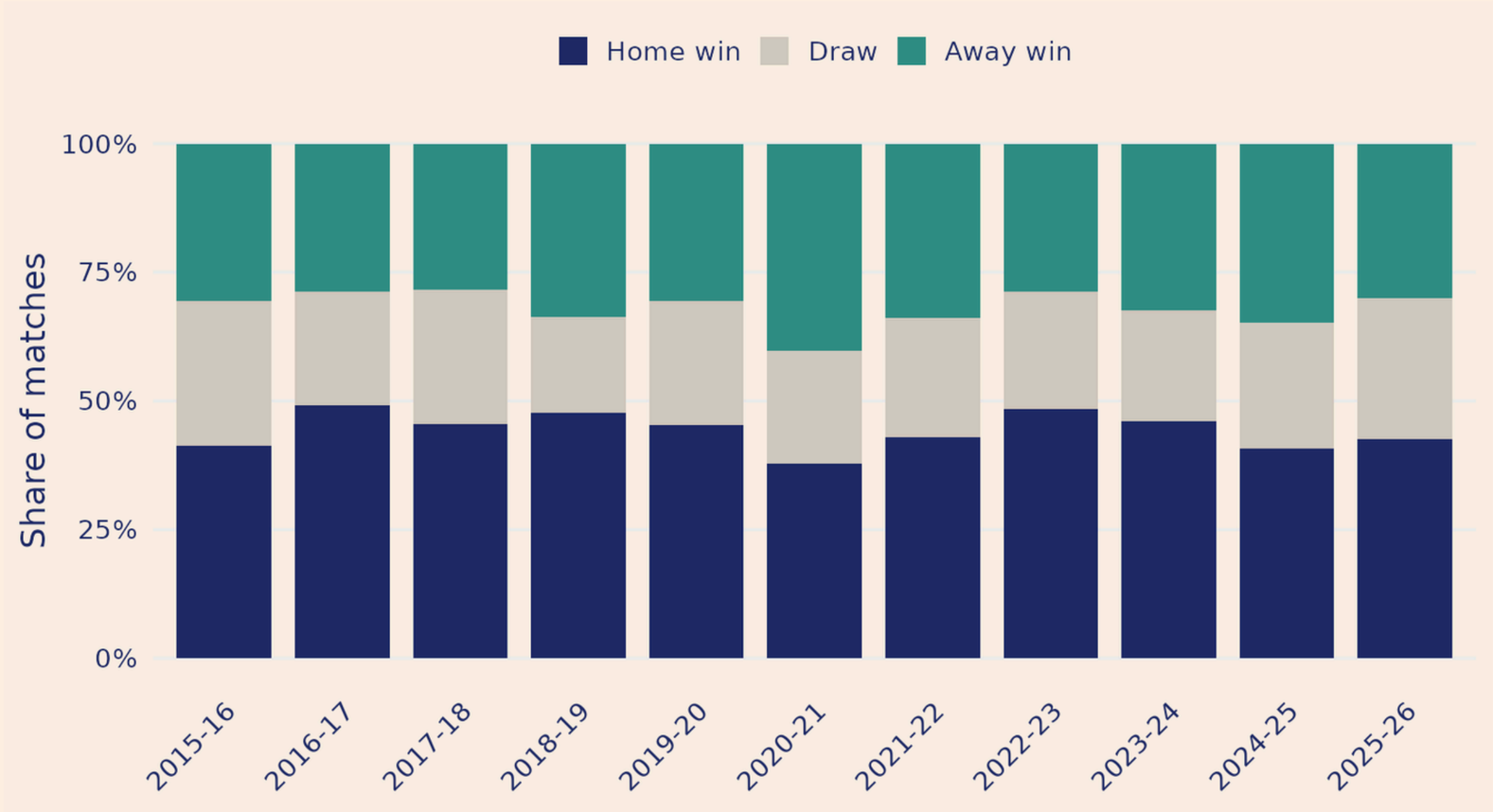
What is Happening

- Home teams usually outscored away teams by about 0.3 goals per match
- In 2020-21, that edge fell to just 0.01, the lowest of all 11 seasons
- It came back afterwards, reaching 0.21 in 2021-22 and 0.42 in 2022-23

Explanation

Goal difference = home goals minus away goals, averaged per match

Away teams won more often than home teams in 2020-21



Key point

- It’s the only season where away wins outnumbered home wins

Key point

- Home teams won 37.9% of matches and away teams won 40.3%

Home goal advantage nearly vanished in 2020-21

Table 2: Linear regression of home goal difference on a 2020-21 indicator, with 95% confidence intervals.

Term	Estimate	Std. error	t	p-value	Lower 95%	Upper 95%
Intercept (other seasons)	0.303	0.031	9.895	0.000	0.243	0.363
2020-21 vs. other seasons	-0.292	0.102	-2.880	0.004	-0.491	-0.093

Table 3: R-squared and number of matches for the COVID-season model.

R-squared	Matches
0.00198	4180

Explanation

- **Home teams averaged 0.303 more goals than away teams outside 2020–21. During 2020–21, this advantage fell by 0.292 goals, leaving just 0.011 goals per match.**
- **The decline was statistically significant (p = 0.004; 95% CI: −0.491 to −0.093), but the model explained only 0.2% of variation across 4,180 matches.**
- **These results suggest reduced home advantage during pandemic restrictions but cannot establish that absent spectators caused it, given unaccounted factors and dependence between matches.**

Conclusion

Takeaway

- Premier League home advantage was evident in most seasons but largely disappeared in 2020–21.

Key point 1

- Home goal advantage fell from approximately 0.30 to 0.01 goals per match, and away teams won more often that season(2020-2021).

Key point 2

- Spectators may contribute to home advantage, but further analysis is needed to separate attendance effects from other pandemic-related changes.

Discussion

Discussion + limitations

- Home advantage appeared in most seasons but weakened substantially in 2020–21, when average home goal difference fell to approximately 0.01 and away teams won more often.
- Limitations: Attendance restrictions may help explain the decline, but other pandemic changes and unaccounted team differences prevent causal conclusions. Foul and yellow-card patterns alone do not establish referee bias.

Next steps

- Use match-level attendance data, distinguish restriction periods, adjust for team and opponent strength, and estimate uncertainty to assess the reliability of the differences.