Streaking and Clutching in Round-Based First Person Shooter Esports

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Game types

- Search and Destroy (SnD) in Call of Duty (COD)
  - 2020-2022 Call of Duty League (CDL) matches (qualifiers and majors)
  - 4v4.
  - First to 6 round wins
  - Teams swap sides (offense and defense) after every round
- Plant/Defuse in Valorant
  - Data from Valorant professional league, updated through January 1, 2022
  - 5v5
  - First to 13 round wins
  - One team plays offense in 12 consecutive rounds before swapping sides
  - Must win by 2 rounds

How does a team win a round of COD SnD / Valorant plant/defuse?

1. One team eliminates all members of the other team prior to a bomb plant.

2. The offensive team eliminates all members of the defensive team after a bomb plant.

3. The defensive team defuses the bomb after a bomb plant.

Often the defensive team will try to eliminate all o team members prior to making the defuse, but in some cases, they may try to “ninja” defuse.

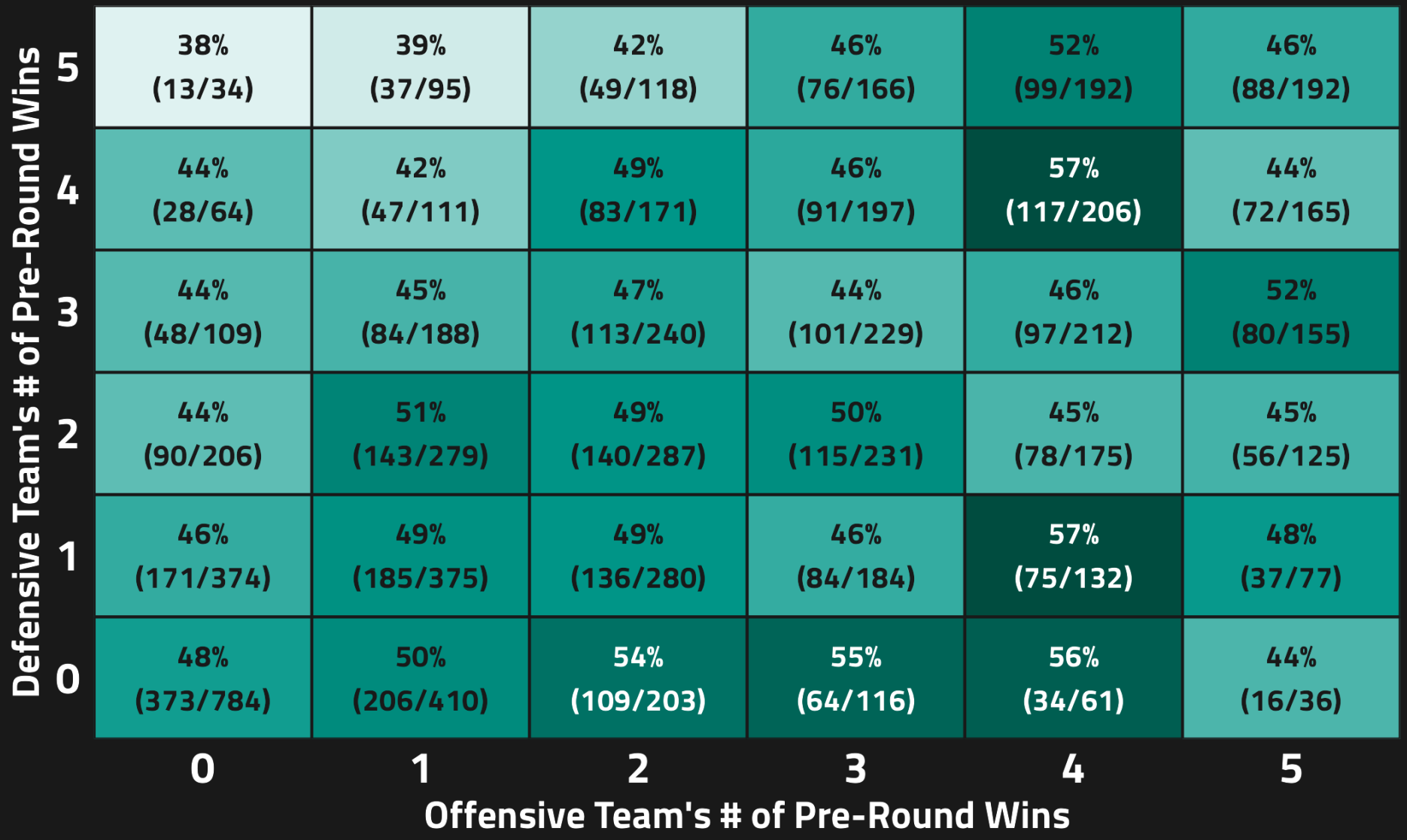
4. The offensive team does not make a plant by the time the round timer ends.

COD SnD data overview

- Total series: **784**
- Total rounds: **7,179**
- Offensive plant %: **52%**
- Offensive win %: **48%**
- Win % when planting: **66%**
- Win % when earning first blood: **73%**

What are your chances of winning a round, given the series state?

Offensive Round Win %



CDL SnD Major and Weekly matches, 2020 - present

How do the empirical round results compare to expectation?

Offensive Round Win % Over Expected

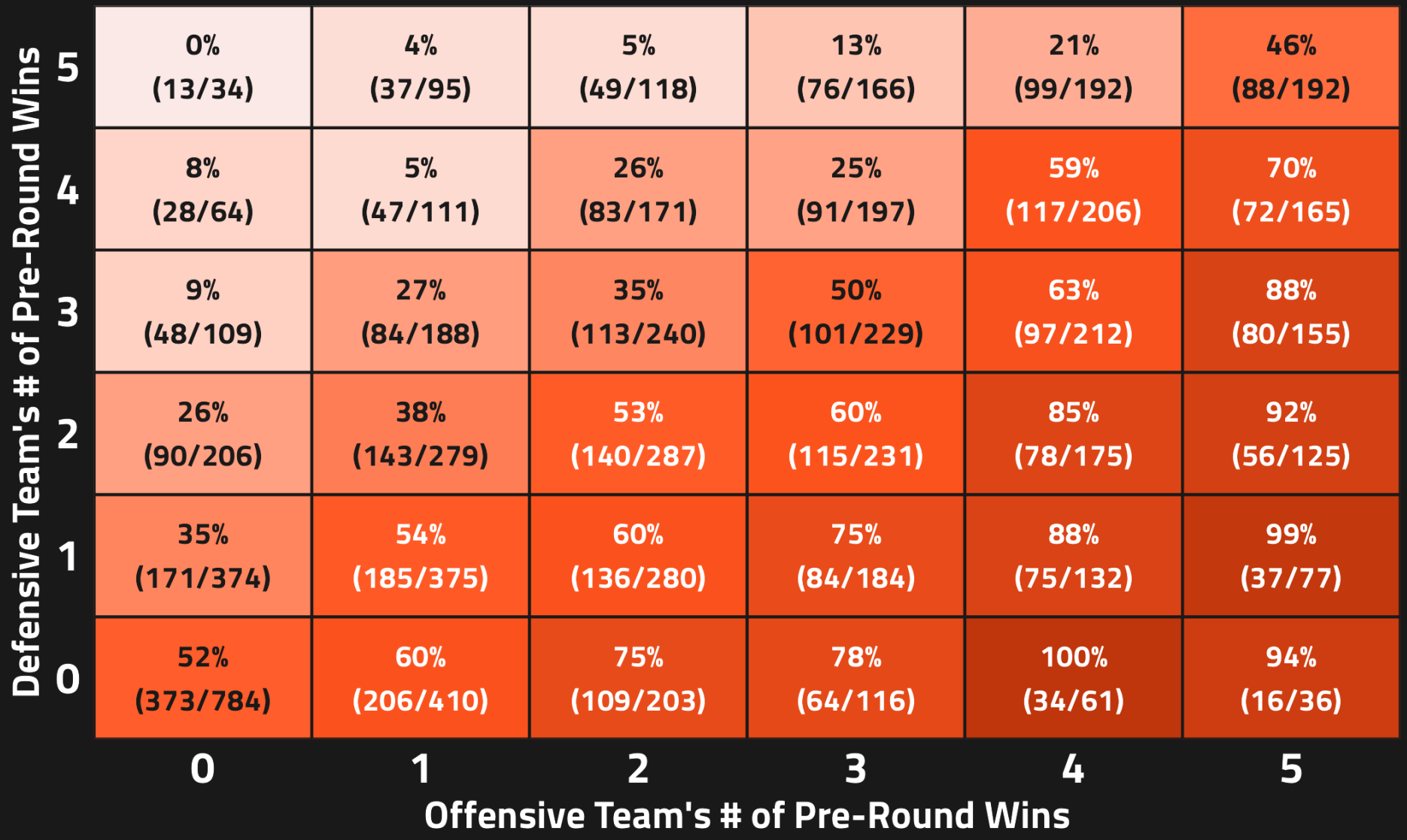
Defensive Team's # of Pre-Round Wins	0	1	2	3	4	5
5	-10 (13/34)	-9 (37/95)	-6 (49/118)	-2 (76/166)	+4 (99/192)	-2 (88/192)
4	-4 (28/64)	-6 (47/111)	+1 (83/171)	-2 (91/197)	+9 (117/206)	-4 (72/165)
3	-4 (48/109)	-3 (84/188)	-1 (113/240)	-4 (101/229)	-2 (97/212)	+4 (80/155)
2	-4 (90/206)	+3 (143/279)	+1 (140/287)	+2 (115/231)	-3 (78/175)	-3 (56/125)
1	-2 (171/374)	+1 (185/375)	+1 (136/280)	-2 (84/184)	+9 (75/132)	+0 (37/77)
0	-0 (373/784)	+2 (206/410)	+6 (109/203)	+7 (64/116)	+8 (34/61)	-3 (16/36)

Offensive Team's # of Pre-Round Wins

CDL SnD Major and Weekly matches, 2020 - present

What are your chances of winning the series, given the series state?

Offensive Series Win %



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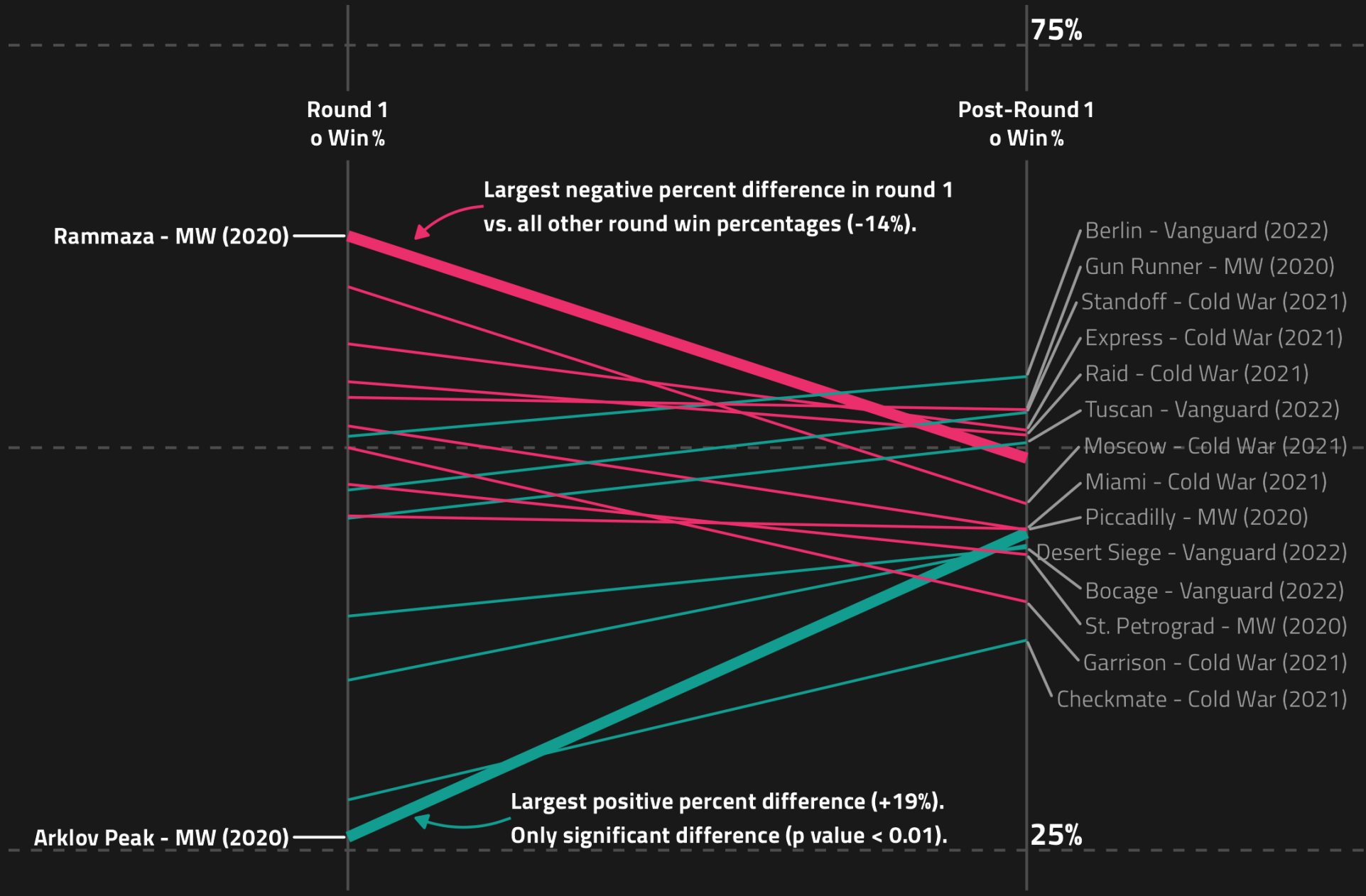
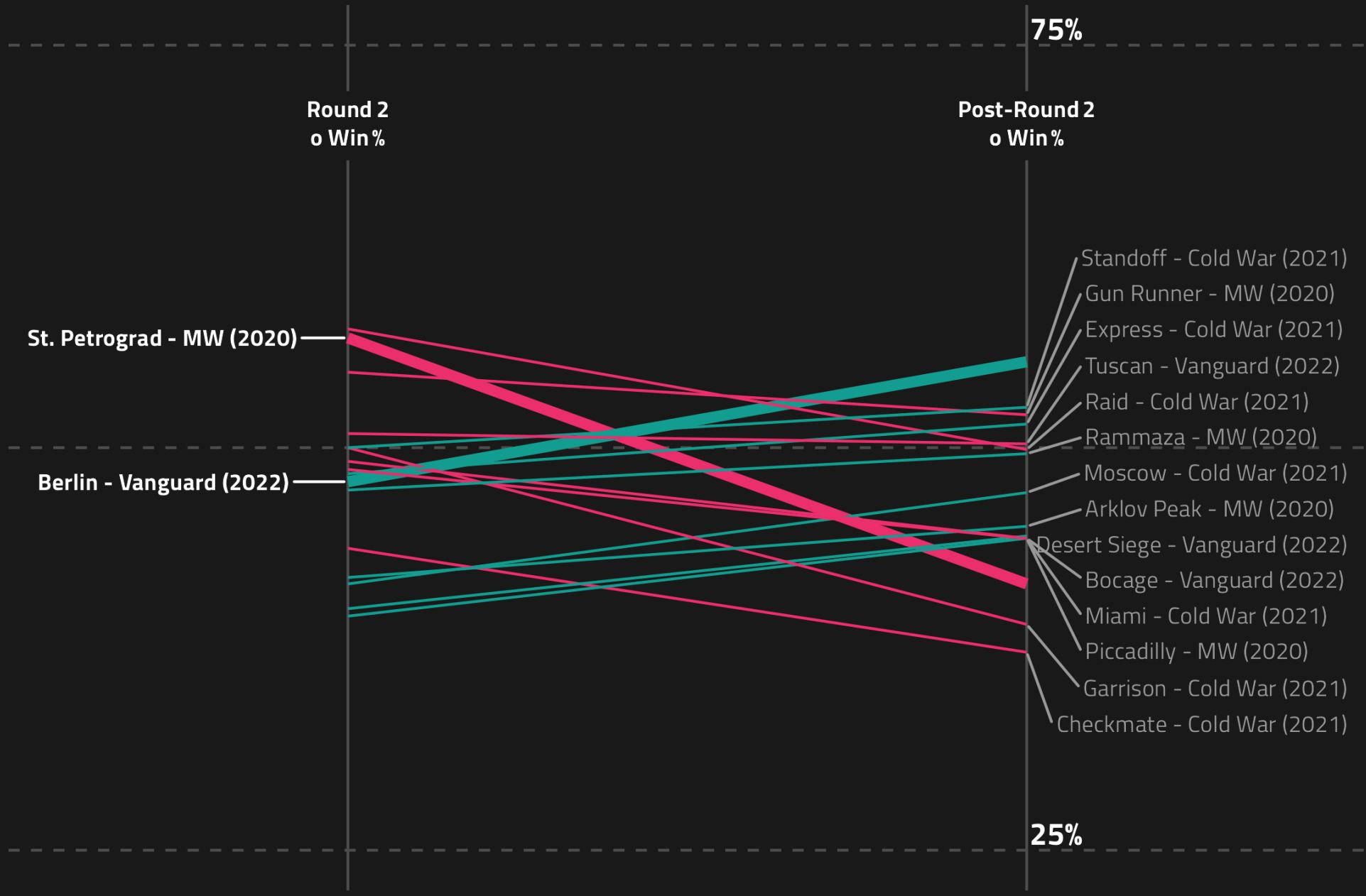
Offensive Team's # of Pre-Round Wins

CDL SnD Major and Weekly matches, 2020 - present

Are offensive win %’s different in round 1?


75%
Round 1
o Win %
Post-Round 1
o Win %
Largest negative percent difference in round 1
vs. all other round win percentages (-14%).
Rammaza - MW (2020)
Berlin - Vanguard (2022)
Gun Runner - MW (2020)
Standoff - Cold War (2021)
Express - Cold War (2021)
Raid - Cold War (2021)
Tuscan - Vanguard (2022)
Moscow - Cold War (2021)
Miami - Cold War (2021)
Piccadilly - MW (2020)
Desert Siege - Vanguard (2022)
Bocage - Vanguard (2022)
St. Petrograd - MW (2020)
Garrison - Cold War (2021)
Checkmate - Cold War (2021)
Largest positive percent difference (+19%).
Only significant difference (p value < 0.01).
Arklov Peak - MW (2020)
25%

Are offensive win %’s different in round 2?


75%
Round 2
o Win %
Post-Round 2
o Win %
St. Petrograd - MW (2020)
Berlin - Vanguard (2022)
Standoff - Cold War (2021)
Gun Runner - MW (2020)
Express - Cold War (2021)
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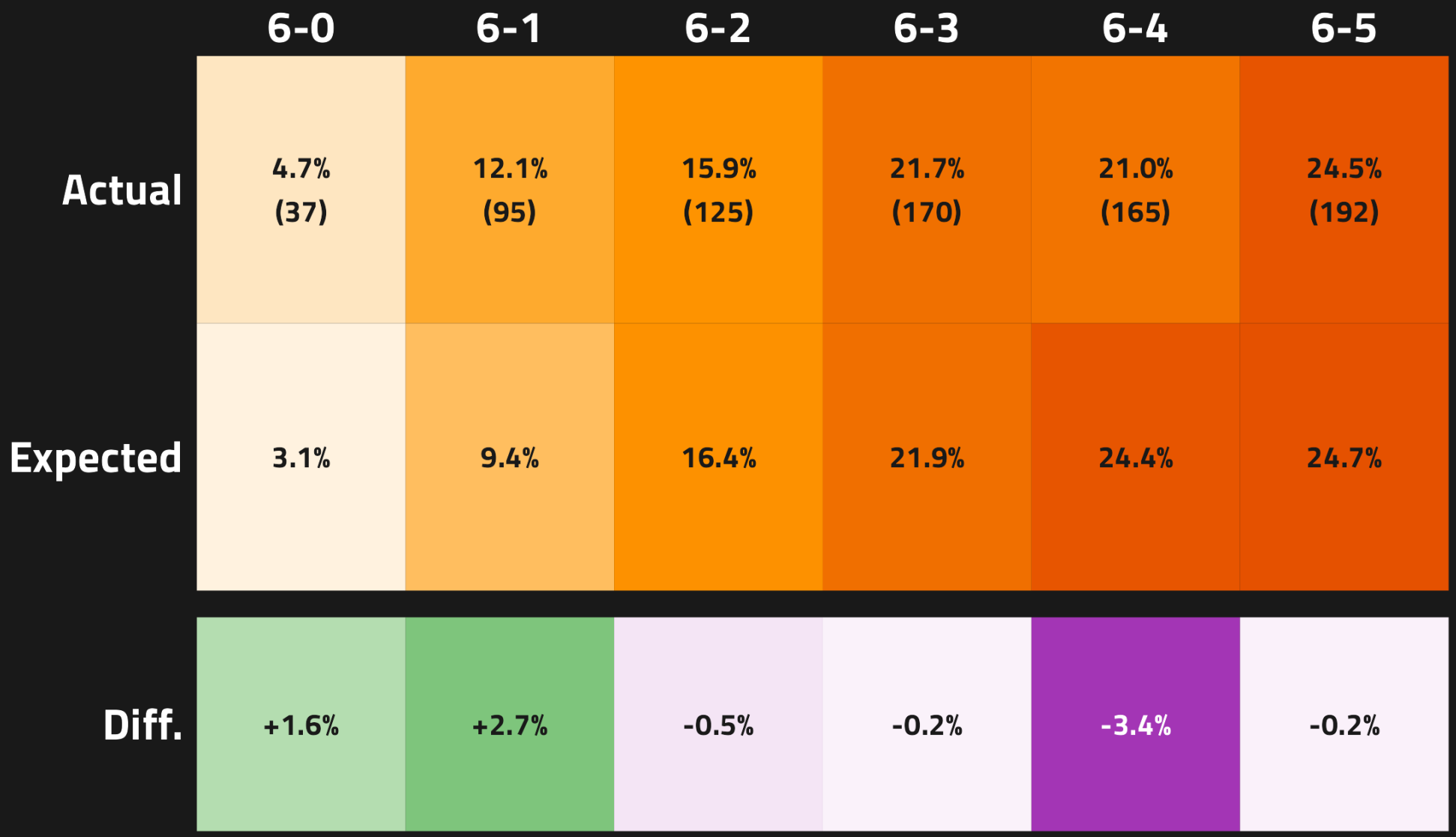
Checkmate - Cold War (2021)
25%

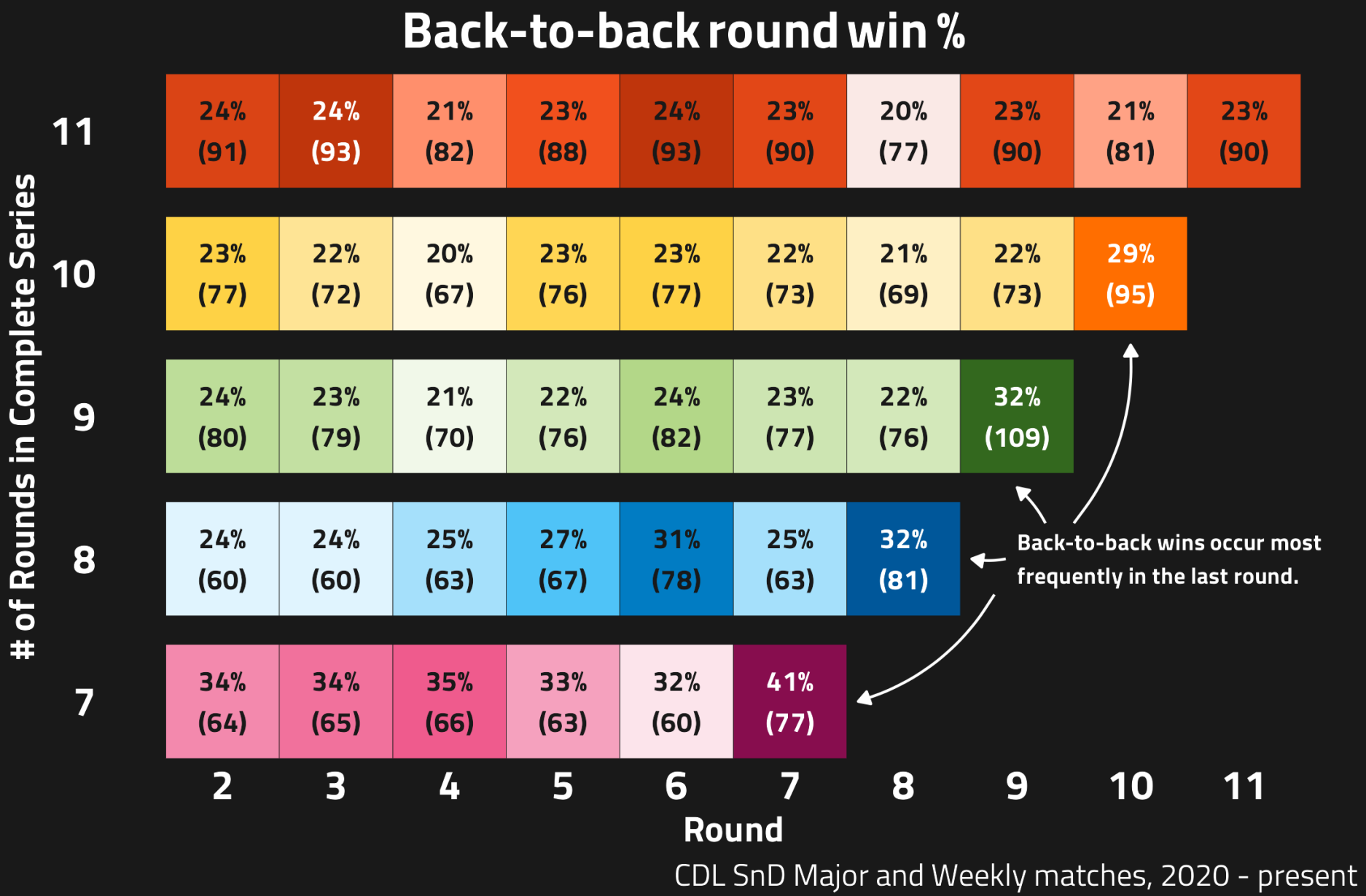
What are the most common series winning states?

Series outcome %



CDL SnD Major and Weekly matches, 2020 - present

When do back-to-back round wins occur?



CDL SnD Major and Weekly matches, 2020 - present

Is there evidence for the “hot hand”?

- Round win % after a streak of 3 round wins:
- Expected: **38.4%**
- Actual: **55.7%** (352 / 632)

What is the optimal strategy?

Plant side	%
Primary	60.9%
Secondary	39.1%

Plant side	Win %
Primary	47.4%
Secondary	39.1%