

# **Streaking and Clutching in Round-Based First Person Shooter Esports**

Tony ElHabr

## 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 %

Defensive Team's # of Pre-Round Wins	5					
	38% (13/34)	39% (37/95)	42% (49/118)	46% (76/166)	52% (99/192)	46% (88/192)
	44% (28/64)	42% (47/111)	49% (83/171)	46% (91/197)	57% (117/206)	44% (72/165)
	44% (48/109)	45% (84/188)	47% (113/240)	44% (101/229)	46% (97/212)	52% (80/155)
	44% (90/206)	51% (143/279)	49% (140/287)	50% (115/231)	45% (78/175)	45% (56/125)
	46% (171/374)	49% (185/375)	49% (136/280)	46% (84/184)	57% (75/132)	48% (37/77)
0	48% (373/784)	50% (206/410)	54% (109/203)	55% (64/116)	56% (34/61)	44% (16/36)
Offensive Team's # of Pre-Round Wins						
0						
1						
2						
3						
4						
5						

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	5					
	-10 (13/34)	-9 (37/95)	-6 (49/118)	-2 (76/166)	+4 (99/192)	-2 (88/192)
	-4 (28/64)	-6 (47/111)	+1 (83/171)	-2 (91/197)	+9 (117/206)	-4 (72/165)
	-4 (48/109)	-3 (84/188)	-1 (113/240)	-4 (101/229)	-2 (97/212)	+4 (80/155)
	-4 (90/206)	+3 (143/279)	+1 (140/287)	+2 (115/231)	-3 (78/175)	-3 (56/125)
	-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						
012345						

CDL SnD Major and Weekly matches, 2020 - present



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

# Offensive Series Win %

Defensive Team's # of Pre-Round Wins	5	4	3	2	1	0
	0% (13/34)	4% (37/95)	5% (49/118)	13% (76/166)	21% (99/192)	46% (88/192)
	8% (28/64)	5% (47/111)	26% (83/171)	25% (91/197)	59% (117/206)	70% (72/165)
	9% (48/109)	27% (84/188)	35% (113/240)	50% (101/229)	63% (97/212)	88% (80/155)
	26% (90/206)	38% (143/279)	53% (140/287)	60% (115/231)	85% (78/175)	92% (56/125)
	35% (171/374)	54% (185/375)	60% (136/280)	75% (84/184)	88% (75/132)	99% (37/77)
	0	1	2	3	4	5
	52% (373/784)	60% (206/410)	75% (109/203)	78% (64/116)	100% (34/61)	94% (16/36)
	Offensive Team's # of Pre-Round Wins					

CDL SnD Major and Weekly matches, 2020 - present

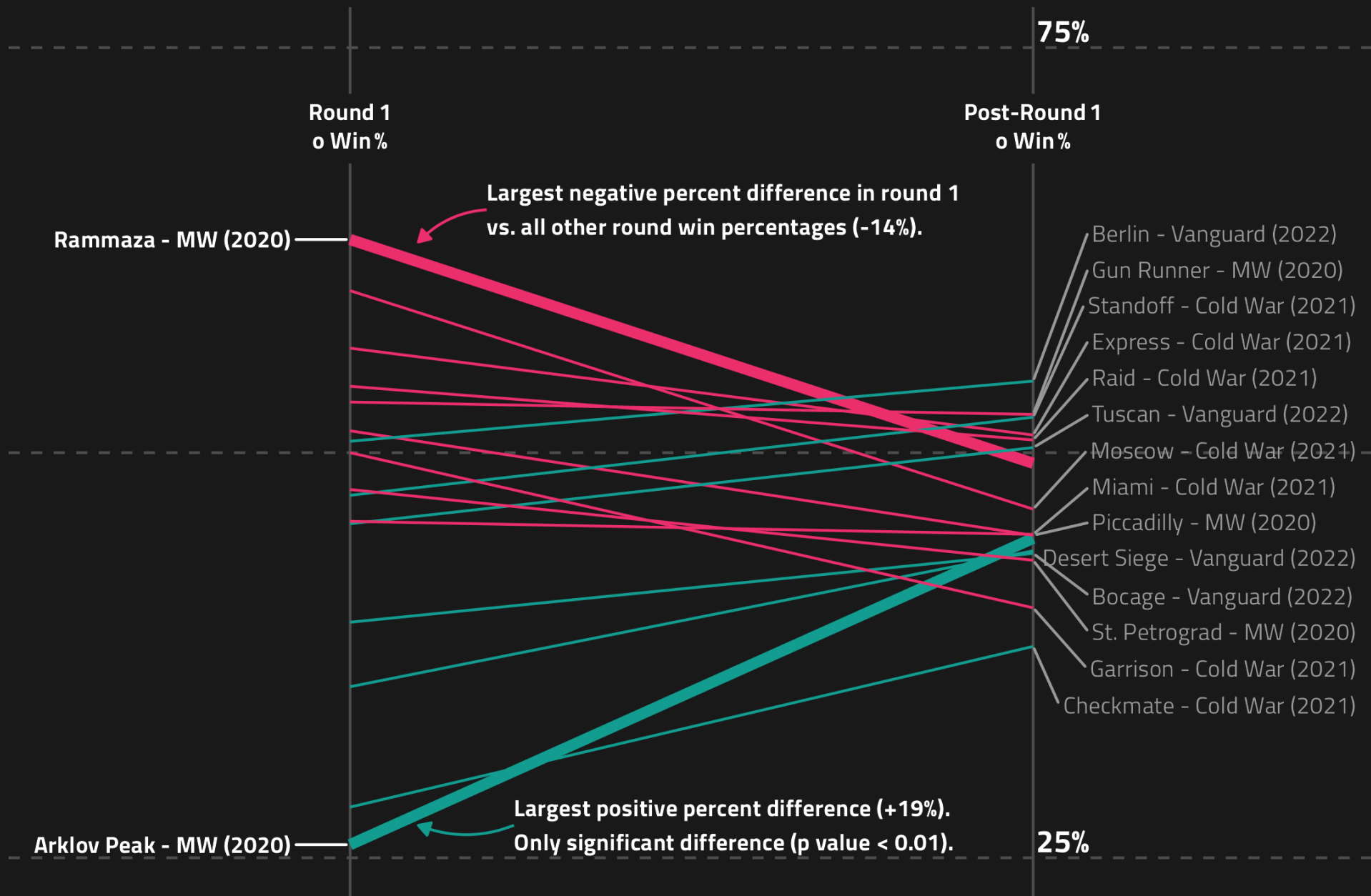
**How do the empirical series results compare to expectation?**

# Offensive Series Win % Over Expected

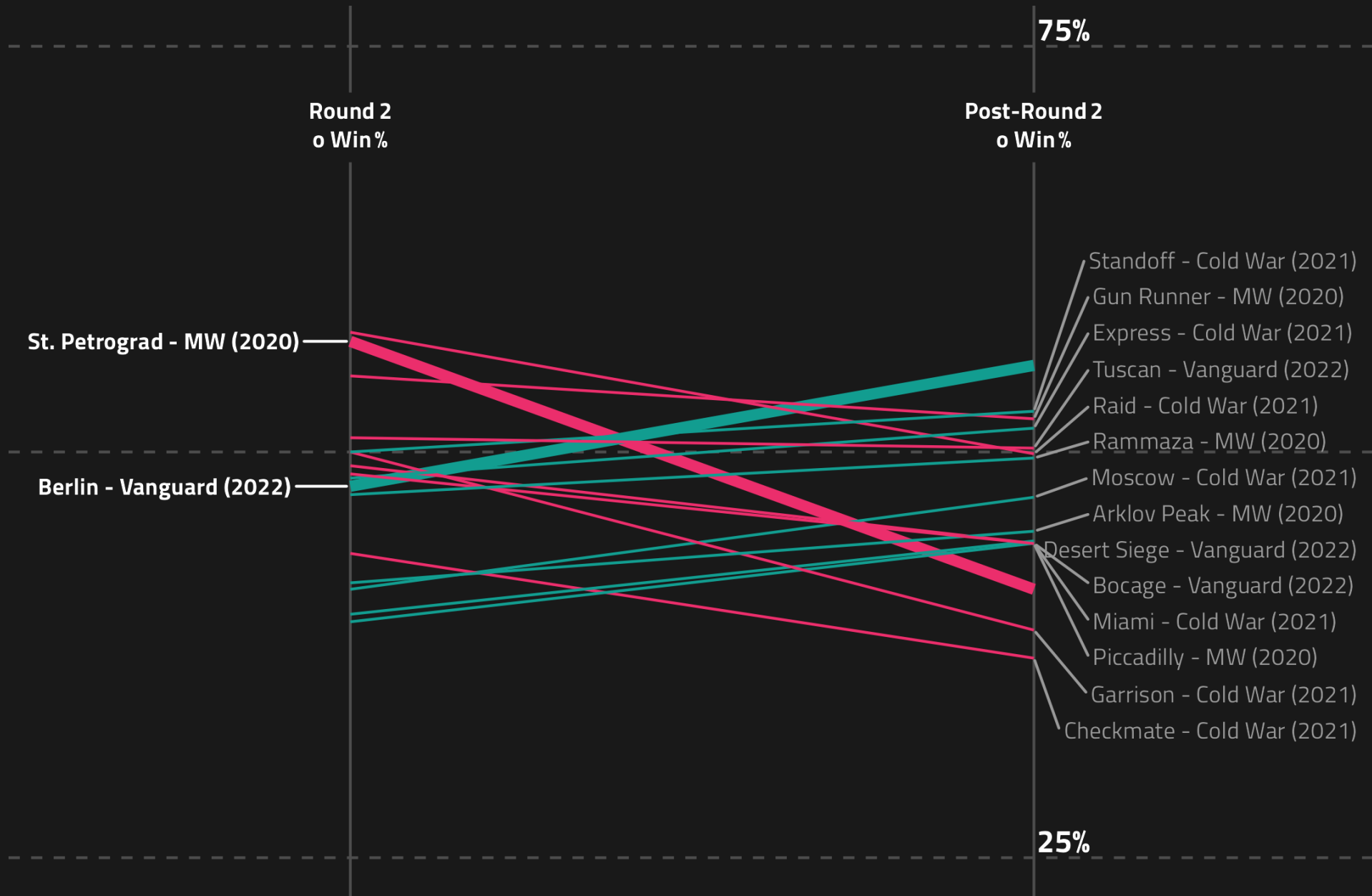
Defensive Team's # of Pre-Round Wins	5					
	-2 (13/34)	+1 (37/95)	-1 (49/118)	+1 (76/166)	-4 (99/192)	-4 (88/192)
	+2 (28/64)	-6 (47/111)	+7 (83/171)	-6 (91/197)	+9 (117/206)	-5 (72/165)
	-5 (48/109)	+4 (84/188)	+0 (113/240)	-0 (101/229)	-6 (97/212)	+1 (80/155)
	+0 (90/206)	+2 (143/279)	+3 (140/287)	-6 (115/231)	+4 (78/175)	-2 (56/125)
	-2 (171/374)	+4 (185/375)	-3 (136/280)	-2 (84/184)	-1 (75/132)	+2 (37/77)
0	+2 (373/784)	-2 (206/410)	+1 (109/203)	-7 (64/116)	+6 (34/61)	-4 (16/36)
Offensive Team's # of Pre-Round Wins						
012345						

CDL SnD Major and Weekly matches, 2020 - present

**Are offensive win %'s different in round 1?**



**Are offensive win %'s different in round 2?**





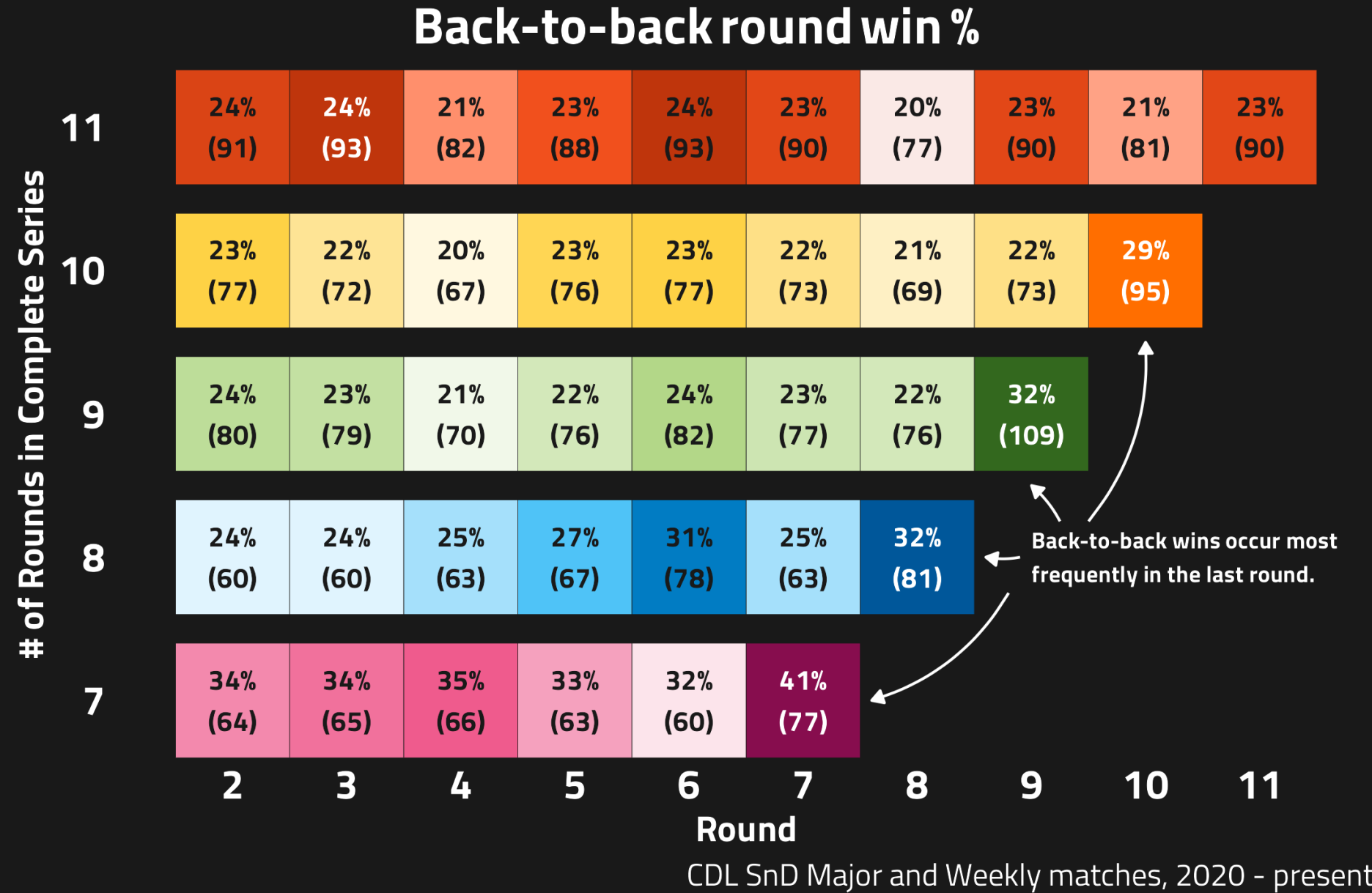
**What are the most common series winning states?**

## Series outcome %

	6-0	6-1	6-2	6-3	6-4	6-5
Actual	4.7% (37)	12.1% (95)	15.9% (125)	21.7% (170)	21.0% (165)	24.5% (192)
Expected	3.1%	9.4%	16.4%	21.9%	24.4%	24.7%
Diff.	+1.6%	+2.7%	-0.5%	-0.2%	-3.4%	-0.2%

CDL SnD Major and Weekly matches, 2020 - present

# When do back-to-back round wins occur?



## 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 site	%
Primary	60.9%
Secondary	39.1%

Plant site	Win %
Primary	47.4%
Secondary	48.5%