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Observation of spectators' mask-wearing behavior at a national basketball tournament

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Abstract

1. **Rationale/Purpose—**Mass gathering events have resumed with the availability of SARS-CoV-2 vaccines. However, the pandemic is ongoing and such events potentially contribute to upsurges in COVID-19 cases. There is mounting evidence that public health mitigation strategies such as mask requirements, capacity restrictions, and physical distancing reduce transmission risk. However, evidence suggests imperfect compliance with these strategies. This study aimed to quantify spectators' masking behaviors and identify correlates of mask-wearing during a major sporting event.

2. **Design/Methodology/Approach—**This study used a repeated cross-sectional design, in which trained observers used a web-based application to record counts of mask-wearing.

3. **Findings—**Overall, 74% of spectators observed correctly wore masks. Mask-wearing behavior was associated with presumed sex, location of the spectator, game competitiveness, and whether the teams playing originated from a state with an active mask mandate.

4. **Implications—**Understanding the factors associated with masking behavior may help venues prepare for future events and identify innovative and targeted strategies to promote compliance with public health mitigation measures.

5. **Contribution—**This study makes contributions to understanding how to manage public health risks during a high-profile sporting event, specifically by identifying spectator-, game-, venue-, and state-level factors associated with mask-wearing.

Keywords

spectator event; mass gathering; public health; pandemic; sporting event

Introduction

Mass gatherings, such as high-profile spectator or sporting events, potentially catalyze outbreaks of communicable diseases by exposing attendants to non-household members for prolonged durations and increased, close contact with other attendees (Cardazzi et al.,

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2020; Hoang et al., 2020; Memish et al., 2019). Also, sporting events encourage shouting, close proximity and congregating, which can increase the risk of COVID-19 transmission (World Health Organization, 2020). Mass gatherings, including basketball games and soccer (football) matches, have been associated with outbreaks of communicable disease at the event and in hosting communities (Ahammer et al., 2020; Carlin et al., 2021; Cuschieri et al., 2021; Olczak et al., 2021; Signorelli et al., 2020). Out of concern that large sporting events could become super-spreader events, numerous sports organizations in the United States and worldwide canceled, postponed, suspended, or organized events with no or limited audiences in response to the COVID-19 pandemic (Ahammer et al., 2020; Carlin et al., 2021; Paine, 2020).

However, as the pandemic has persisted, interest in holding and attending large sporting events has also increased, even in the absence of widespread vaccination availability and limited therapeutic options (Perić et al., 2021; Ricciardelli, 2021). Large sporting events signaled widespread desire to return to a pre-pandemic sense of normalcy (Red, 2021). Due to reported associations with better physical and mental health, attending sporting events may also combat pandemic-related isolation (Bouchat et al., 2020; Inoue et al., 2018; Konlaan et al., 2000; McCloskey et al., 2020). Moreover, a return of sporting events would be an economic recovery opportunity for individuals and local governments (Matheson, 2006) since estimates suggest pandemic-related restrictions on mass gatherings, like large sporting events, furloughed, erased, or reduced many jobs across the leisure, tourism, and hospitality industry (Ansell & Mullins, 2021).

Event organizers and public health authorities can implement a variety of measures to curb risk of transmission (World Health Organization, 2021) and reassure attendants (Perić et al., 2021). In particular, face coverings or masks are low-cost and effective means to reduce the transmission of SARS-CoV-2, which is the cause of COVID-19 (J. Howard et al., 2021).

Problematically, general compliance with face-mask wearing in public was documented to be limited (Rader et al., 2021; Vest, Cash-Goldwasser, et al., 2021) and anecdotal reports indicated that spectators at sporting events may not properly or consistently wear face masks (Goodwin, 2021; Lush et al., 2021; Walsh, 2020). Our study contributes to the growing body of literature on mass gathering safety by observing spectators at a high-profile national basketball event and quantifying their mask-wearing behavior. Additionally, we identified characteristics and factors that could explain variation in mask-wearing behavior across several games. Findings from this study can help support public health agencies, local government officials, and event organizers prepare for and safely conduct mass gathering events during the current and future public health emergencies.

Methods

Setting

Indianapolis, Indiana, USA hosted the 2021 NCAA “March Madness” tournament. We counted observations of public behavior during five games from March 30 to April 5, 2021. All games took place in Lucas Oil Stadium, an indoor football stadium that was converted into a basketball arena for the championship tournament. The NCAA and Lucas

Oil Stadium capped attendance at 22% of maximum capacity for all games, (Pells et al., 2021). Fans were allowed to purchase a limited number of tickets in groups or pods of two to six tickets to facilitate physical distancing (Lucas Oil Stadium, 2021). Between approximately 6,200 and 7,500 spectators attended each of the four regional final ("Elite 8") games (*NCAA Men's Basketball Attendance*, 2021), 8,131 spectators attended the national semifinal games ("Final Four"), and 7,923 spectators watched the championship game in-person (Mills, 2021; *NCAA Men's Basketball Attendance*, 2021). The venue required face coverings to be worn upon entry and throughout the game except when actively eating or drinking in assigned seats (Lucas Oil Stadium, 2021). Disposable surgical masks were provided to spectators without approved face coverings upon entry. The venue also installed signs and played messages through public address systems reminding spectators to keep face coverings on and to maintain physical distancing. Eating and drinking areas near concessions stands were restricted to spectators. Ushers carried signs and engaged with spectators to enforce compliance with protocols. Both the state of Indiana and Marion County, where the games took place, had mask mandates in place at the time of the tournament (Bradley, 2021).

Data Collection

As previously described in another paper(Vest, Blackburn, et al., 2021), trained observers classified observed spectators as "masked," "partially masked," or "not masked" per guidelines from the Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, 2020)." Observers collected counts of mask-wearing behavior and presumed sex in MaskCount™, a Web-based app developed by Regenstrief Institute. MaskCount™ allows users to record mask-wearing behavior and location data. The app protects the privacy of those being observed by not having options to record video, take pictures, or enter in identifying information (Regenstrief Institute, 2021). Observers did not approach, engage, interact with, or converse with spectators during data collection. The Indiana University Institutional Review Board considered this observation of public behavior exempt.

Additional Measures

Presence of State Mask Mandates—For each observed game, we determined the status of face-mask mandates of the competing teams' respective states. The tournament attracted mostly out-of-state attendants, so these spectators' masking behavior may have been influenced by the policies in place in their state of residence. To identify which states had implemented mask mandates, we reviewed press releases from state health departments, governors' offices, or health-related government websites. At the time of the tournament, California, Michigan, and Washington had mask mandates in place (California Department of Public Health & Office of Public Affairs, 2020; Sutfin, 2020; WA Governor's Office, 2020). Texas did not (Texas Department of Health Services, 2021). We operationalized statewide mask mandate as a three-level categorical variable: neither team, one team, or both teams.

Competitiveness—Competitive contests, and those associated with championships, tend to increase spectator emotions and lead to less compliant behaviors, possibly including correct mask-wearing (Madrigal, 2003). In comparison, uncompetitive events are associated

with spectator disinterest (Nicholson & Hoye, 2005; Xu et al., 2015). For bivariate and multivariable analyses, we operationalized game competitiveness as a continuous the percentage of the entire game in which neither team had a greater than 90% estimate according to ESPN's Win Probability models. For example, if a game consisting of two 20-minute halves surpassed a win probability of 90% at 10 minutes into the first half, then the proportion of the game that was competitive was 0.25. We selected the 90% threshold after visually examining the within game probabilities for each game.

Statistical Analyses—We tabulated the frequency of masking, partial masking, and non-masking as a percentage of total spectators observed and stratified frequencies by game, sex, location, timing of observations, presence of statewide mask mandate, whether more or less than half the game was competitive. Then, we used a fractional multinomial logit (fmlogit) model to examine factors associated with mask-wearing behavior. Fmlogit models a set of dependent variables (masked, partially masked, not masked) that are continuous and range between zero and one (Buis, 2017; Papke & Wooldridge, 1996). Robust standard errors were clustered at the game level. All statistical analyses were conducted using Stata/SE version 17.1 (StataCorp, College Station, Texas).

Results (Findings)

Sample Characteristics and Descriptive Statistics

The sample included 21,355 observations of spectators. Univariate analyses showed that 73.9% of spectators were correctly masked (Table 1). When examining masking behavior by presumed sex, 81.3% of female spectators wore masks compared to male spectators 69.8%. In addition, a larger percentage of male spectators partially wore masks (10.9%) compared to female spectators (6.8%).

Masking behavior varied by location. The upper deck had the lowest percentage of spectators wearing masks (34.5%) compared to concessions, which had the highest percentage of masked spectators (83.3%). Relatively low mask wearing was also observed in stands (66.7%). Entrance gates tended to have higher percentages of masked spectators (80.3%) than exit gates (77.8%).

Percentage of masked spectators fluctuated throughout the time points in the game and as the tournament progressed. Lower mask wearing was observed during the first half of play (70.3%) and the second half of play (68.2%). Percentage of masked spectators was higher during pregame, halftime, and postgame, when players were off the court or warming up. Partial masking remained constant throughout each time points. Highest mask wearing was observed earlier in the tournament during the Elite 8 round (games 1 and 2). Mask wearing declined in the Final 4 games (games 3 and 4) and was lowest in the Championship game (game 5).

Finally, we observed differences in masking behavior by presence of state mask mandates. Percentage of masked spectators was highest when both teams originated from states with mask mandates (76.1%) and lower when only one team (68.6%) or neither team (73.5%,) originated in states with mask mandates in place.

Marginal Effects from Fractional Multinomial Logit Models

Sex—Female spectators were 12.6 percentage points (95% CI: 9.1 to 16.2) more likely to wear masks correctly than male spectators (Table 2). Female spectators were also 4.4 percentage points (95% CI: −7.05 to −1.73) less likely to be partially masked.

Location—Stadium entrance was the reference variable for location. Spectators in the stadium's upper deck were 46.4 percentage points (95% CI: −55.5 to −37.3), less likely to be observed correctly masked in adjusted models. In unadjusted and adjusted models, we found no statistically significant differences in non-masked spectators at other locations. Spectators were more likely by 3.8 percentage points to be partially masked (95% CI: 1.3 to 6.3) in concession areas and 2.5 percentage points more likely to be partially masked in exits (95% CI: 0.3 to 4.8). In the stands, spectators were 16.9 percentage points less likely to be masked (95% CI: −31.7 to −2.2).

Time—After adjusting for all other variables, time was not associated with probability of a spectator being masked. In adjusted models, only postgame periods were associated with a 0.95 percentage point increase in probability of observing a partially masked spectator (95% CI: 0.3 to 1.6).

Competitiveness—After adjusting for all other predictors, more competitive games had a 3.0 percentage point higher likelihood of spectators not being masked (95%CI: 0.2 to 5.9). In addition, our model demonstrates that more competitive games are associated with a 2.83 percentage point decrease (95% CI: −3.72 to −1.94) in probability of partially masking.

State Mask Mandates—State public health policies were associated with spectators' mask wearing behavior. If teams that were playing against each other were both located in states with mask mandates in place, then the probability of a spectator being correctly masked increased by about 2 percentage points (95% CI: 1.2 to 2.7), compared to when competing teams traveled from states without a mask mandate in effect. However, if only one out of the two teams came from a state with a mask mandate, then the probability of a observing a correctly masked spectator decreased by 4.5 percentage points (95% CI: −5.2 to −3.8). Additionally, if only one out of the two teams came from a state with a mask mandate, then the probability of observing a non-masked spectator increased by 3.3 percentage points (95% CI: 2.9 to 3.7), but if both teams traveled from a state with mask mandates, then the probability of observing a non-masked spectator decreased by 3.2 percentage points (95% CI: −4.0% to −2.4). After adjusting for all other predictors, if one or both teams were from a state with a mask mandate, then the likelihood of partially masking increased by 1.23 percentage points (95% CI: 0.9 to 1.5).

Discussion

Key Findings

The overall percentage of spectators who correctly wore masks across five national collegiate men's basketball games as part of the Division I Men's Basketball National Championship was nearly 74%. Mask wearing behavior was associated with sex, location of

the spectator, competitiveness of the game, and whether the teams playing originated from a state with an active mask mandate.

Stadium location was associated with masking behavior. We found a significant decrease in the probability of observing masked spectators seated in the upper decks and stands and a significant increase in the probability of spotting unmasked spectators in upper deck seats. The more expansive seating in the upper decks combined with pod-based seating may have permitted greater social distancing from other pods in the stands and upper deck, and thus spectators may have perceived removing masks to be less risky when situated within their group. Behavioral scientists have postulated that both harmful and preventive behaviors may be influenced by social norms and nudges (Bavel et al., 2020). Because the upper deck also had a smaller presence of masked venue staff tasked with enforcing mask wearing, spectators encountered fewer “nudges.” Incidentally, this section was dimly lit compared to seating with greater proximity to the court and may have contributed to mask noncompliance.

After adjusting for all other predictors, female spectators were more likely to be correctly masked and less likely to be partially masked or not masked than male spectators. Our findings are consistent other studies that demonstrate gender differences in face mask perceptions (M. C. Howard, 2021) and self-reported engagement in preventive health measures (Okten et al., 2020). Lower rates of mask wearing among male spectators is concerning because males with COVID-19 have higher odds of requiring more intensive care and mortality than females with COVID-19 (Peckham et al., 2020).

More competitive games, modeled as the proportion of the game in which ESPN’s win probability was below 90%, increased the likelihood of observing unmasked spectators but decreased the likelihood of observing partially masked spectators. We surmised that spectators during more competitive games allowed masks to slide off while cheering, or intentionally removed masks in order to cheer more audibly or were generally less vigilant about their behavior. This behavior raises the risk virus transmission by increasing both the rate and quantity of emitted aerosols (Asadi et al., 2019).

We speculated that state mask mandates would be associated with a higher likelihood of correct mask wearing since other research has shown higher rates of mask adherence in states with mask wearing policies, and our findings partly supported this hypothesis (Fischer et al., 2021). Spectators could have been more accustomed to or conditioned to wear masks if they had already been required to do so before arriving at the stadium. Spectators arriving from states without mask mandates could have been less accustomed to or less comfortable with wearing masks correctly and over long durations of time. When both teams originated from a state with active mask mandates, then the probability of observing mask-wearing increased relative to when neither team originated from a state without an active mask mandate. However, if only one out of two teams traveled from a state with an active mask mandate (e.g., Gonzaga University versus Baylor University), then the probability of observing correctly masked spectators decreased, relative to games in which both teams had traveled from a state without an active mask mandate (e.g., Baylor University versus University of Houston).

Limitations

We observed only the five final games of the tournament, because these games all took place at one venue that granted permission for data collection. Additionally, our small team of observers would be unable to collect data across the entire tournament. Therefore, our findings may not reflect masking behaviors throughout the entire tournament, However, because these five games occurred in the later stages of the tournament, they may be generalizable to sports with “higher stakes” rounds of play, playoff structures, or any other sport played in a stadium.

By opting for a repeated cross-sectional design, we were able to observe changes across different points during the game, across the five games, and across different areas of the venue. However, this design does not allow for assessments of spectator-level changes in masking behavior over time or by location. Our observational design also cannot identify causal relationships.

Not all areas of the stadium were easily accessible to our team of trained observers. The stadium’s upper deck had fewer walkways and aisles that observers could walk through to observe masking behavior. Limited walkway accessibility in certain areas of the stadium likely contributed to lower rates of mask wearing because ushers, whose role included monitoring and reminding spectators, were also less prominent in the upper deck and suites. Observers were also unable to access the stadium’s suites, which were reserved for private gatherings. Consequently, observers collected fewer counts in upper deck and suites, compared to all other locations in the stadium. In total, counts of masking behavior in the upper deck made up only 3.17% of all observations. Additionally, observers only collected 37 observations in suites, so we excluded suites from our analyses. Our approaches for operationalizing competitiveness and state mask mandates used unvalidated and potentially imprecise measurements. A scan of the literature failed to reveal evidence in favor of any one instrument for measuring game competitiveness, so we opted to use ESPN’s live in-game win probability estimates. We did not compare the performance of ESPN’s win probabilities to other prediction models such as FiveThirtyEight’s or Google’s that take into account different factors in their models (Boice & Silver, 2021; Pattani, 2020). The purpose of including a state mask mandate variable in our model was to estimate if spectators’ behaviors during the games could have been modulated by policies enacted in their home state. Because we did not collect spectator-level data on where spectators traveled from and tickets were, we assumed that spectators originated from the same states as the teams that were playing.

We did not consider whether COVID-19 case rates at the time of the tournament were associated with mask-wearing. The incidence of COVID-19 in Indiana on April 5, 2021, the date of the championship and final game of the tournament, was 10 cases per 100,000, an order of magnitude lower than the peak of 125 cases per 100,000 on December 3, 2020 (Regenstrief Institute, 2022). There was little variation in case rates across the five games we observed, so we would not have expected masking behavior to change if spectators were sensitive to COVID-19 trends. Additionally, we did not include case rates from teams’ originating states in our analyses due to collinearity with state mask mandates. Inclusion

of these factors may have provided additional insight about whether COVID-19 trends in Indiana, relative to spectators' originating states, alter spectators' masking behaviors.

Implications

Models and simulations by several research teams have demonstrated that approximately or at least 80% mask-wearing in a population can substantially reduce infection (Kai et al., 2020) and mortality rates (Eikenberry et al., 2020). Even with venues, tournament organizers, state officials, and local authorities in Indiana enacting and enforcing protocols to reduce risk of community transmission (e.g., capacity limits and mask requirements), we observed that only about 74% of spectators correctly wore face coverings. In comparison, another observational study found mask wearing rates above 90% in indoor public areas in December of 2020 (Karimi et al., 2021). As vaccine availability and uptake rises, as pandemic fatigue becomes more pervasive, and as mass spectator events return to full capacity, we may see further declines in protective behaviors such as mask wearing and physical distancing (Crane et al., 2021). If imperfect compliance with any one public health measure is to be expected, event organizers and local officials in charge of planning potentially crowded and raucous mass gatherings should consider enforcing multiple mitigation strategies to reduce risk of communicable disease transmission. Adopting public health strategies and layering multiple mitigation protocols is especially important in areas with larger proportions of vulnerable individuals, low vaccination rates, low vaccine availability, and high infection rates.

Conclusion

A growing interest in resuming and attending mass gathering events such as concerts, conventions, and sporting events reflect society's desire for normalcy (Molla, 2021; Perić et al., 2021; Red, 2021). Perceptions of infection risk and fear of contracting communicable diseases have also waned as the current pandemic persists (Crane et al., 2021; Ricciardelli, 2021). However, onset of novel COVID-19 mutations, novel infectious diseases, endemic diseases, lower than expected vaccine uptake, and lifting of mitigation measures, may endanger those attending mass gatherings. A better understanding of spectator responses to mitigation measures can inform policy during the current pandemic and future public health crises. Event managers and health officials can use this information to help select appropriate venues, target risk communications towards specific audiences and locations, and implement appropriate action plans to mitigate health and safety risks.

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Highlights

- We used a publicly available web-based application to collect mask wearing data at a high-profile basketball tournament taking place during the COVID-19 pandemic.
- We found significant associations between mask-wearing and sex, location of the spectator, competitiveness of the game, and whether the teams playing originated from a state with an active mask mandate.
- Lower than expected compliance with mask requirements suggests opportunities for event managers and health officials to collaborate on planning events, selecting appropriate venues, communicating risk to specific audiences, and implementing the right number of and combination of mitigation strategies.

Table 1.

Characteristics of non-masked, partially masked, and masked spectators during a collegiate-level men's basketball tournament, 2021 (N = 21, 355)

	Not Masked N (%)	Partially Masked N (%)	Masked N (%)
Overall	3,556 (16.7)	2,012 (9.4)	15,787 (73.9)
Sex			
Female	914 (11.9)	519 (6.8)	6,231 (81.3)
Male	2,642 (19.3)	1,493 (10.9)	9,556 (69.8)
Location			
Concessions	520 (6.8)	761 (9.9)	6,402 (83.3)
Entrance	174 (12.7)	97 (7.1)	1,103 (80.3)
Exit	322 (12.0)	273 (10.2)	2,088 (77.8)
Stands	2,139 (23.9)	838 (9.4)	5,960 (66.7)
Upper decks	401 (59.1)	43 (6.3)	234 (34.5)
Competitiveness (mean, SD)			
55.2%			
35.7%			
State Mask Mandate			
Neither State	636 (17.9)	306 (8.6)	2,616 (73.5)
One State	1,073 (21.5)	496 (9.9)	3,427 (68.6)
Both States	1,847 (14.4)	1,210 (9.5)	9,744 (76.1)
NCAA Game			
1	550 (12.0)	489 (10.7)	3,537 (77.3)
2	579 (15.0)	330 (8.5)	2,951 (76.5)
3	636 (17.9)	306 (8.6)	2,616 (73.5)
4	718 (16.4)	391 (9.0)	3,256 (74.6)
5	1,073 (21.5)	496 (9.9)	3,427 (68.6)
Time			
Pregame	848 (14.4)	547 (9.3)	4,502 (76.3)
First Half	891 (20.5)	395 (9.1)	3,050 (70.3)
Halftime	710 (15.2)	445 (9.6)	3,501 (75.2)
Second Half	750 (22.6)	303 (9.1)	2,261 (68.2)

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	Not Masked N (%)	Partially Masked N (%)	Masked N (%)
Postgame	357 (11.3)	322 (10.2)	2,473 (78.5)

Notes: We report game competitiveness as the proportion of a game in which win probability does not exceed 90%. Therefore, the mean competitiveness value represents the average proportion of that the game that was competitive across the five games observed.

Abbreviations: N, number of; SD, standard deviation; NCAA, National Collegiate Athletic Association.

Table 2.

Marginal effects of factors associated with observing masked, partially masked, or not masked spectators.

	Mask				Partially Masked				Not Masked			
	Unadjusted dy/dx	**95% CI**	**Adjusted dy/dx**	**95% CI**	**Unadjusted dy/dx**	**95% CI**	**Adjusted dy/dx**	**95% CI**	**Unadjusted dy/dx**	**95% CI**	**Adjusted dy/dx**	**95% CI**
Gender												
Male	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Female	12.0***	(9.3, 14.7)	12.6***	(9.1, 16.2)	−4.3**	(−7.5, −1.2)	−4.4***	(−7.1, −1.7)	−7.7***	(−9.8, −5.6)	−8.2***	(−9.8, −6.6)
Location												
Entrance	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref		Ref	Ref	Ref
Stands	−13.6	(−30.2, 3.0)	−16.9	(−31.7, −2.2)	2.3	(−1.6, 6.3)	3.9	(−0.2, 7.9)	11.3	(−4.2, 26.8)	13.1	(−1.9, 28.0)
Concession	3.1	(−12.3, 18.4)	1.3	(−9.5, 12.0)	2.9*	(0.4, 5.3)	3.8**	(1.3, 6.3)	−5.9	(−20.2, 8.4)	−51	(−15.3, 5.2)
Exit	−2.5	(−15.2, 10.3)	−0.90	(−8.3, 6.5)	3.1	(−0.2, 6.40	2.5*	(0.3, 4.8)	−0.7	(−12.5, 11.2)	−1.6	(−9.2, 6.0)
Upper Deck	−45.8	(−59.0, −32.6)	−46.4***	(−55.5, −37.3)	−0.7	(−6.8, 5.4)	0.5	(−5.1, 6.2)	46.5***	(33.1, 59.9)	45.9***	(34.5, 57.3)
Time												
Pregame	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
First Half	−6.0*	(−12.0, 0.0)	0.6	(−2.6, 3.8)	−0.2	(−2.9, 2.5)	−1.1	(−3.3, 1.1)	6.2	(−1.7, 14.0)	0.5	(−3.6, 4.5)
Halftime	−1.2	(−6.6, 4.3)	−0.7	(−4.8, 3.5)	0.3	(−0.5, 1.0)	−0.6	(−2.0, 0.7)	0.9	(−4.7, 6.5)	1.3	(−2.9, 5.5)
Second Half	−8.10*	(−14.6, −1.6)	1.3	(−4.0, 6.6)	−0.1	(−1.5, 1.2)	−1.1	(−2.5, 0.4)	8.3**	(2.3, 14.3)	−0.3	(−5.2, 4.7)
Postgame	2.1	(−4.1, 8.3)	−3.8	(−8.6, 0.9)	0.9	(−0.2, 2.1)	1.0**	(0.3, 1.6)	−3.1	(−9.3, 3.1)	2.9	(−2.0, 7.8)
Competitiveness	1.2	(−6.8, 9.1)	−0.2	(−3.3, 2.9)	−1.8***	(−2.9, −0.7)	−2.8***	(−3.7, −1.9)	0.7	(−7.9, 9.2)	3.0*	(0.2, 5.9)
Mask Mandate												
Neither Team	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
One Team	−4.9***	(−4.9, −4.9)	−4.5***	(−5.2, −3.8)	1.3***	(1.3, 1.3)	1.2***	(0.9, 1.5)	3.6***	(3.6, 3.6)	3.3***	(2.9, 3.7)
Both Teams	2.6***	(1.1, 4.1)	2.0***	(1.2, 2.7)	0.9	(−0.3, 2.1)	1.2***	(1.0 1.5)	−3.5**	(−5.9, −1.0)	−3.2	(−4, −2.4)

Notes: The sample size was n = 21, 355. Average marginal effects reported as percentage points and 95% confidence intervals were obtained for each of the variables in the model. Unadjusted marginal effects came from bivariate fractional multinomial logit models and measured the average change in outcome probability. Adjusted average marginal effects measured the average change in outcome probability after accounting for all other covariates in the fractional multinomial logit models.

Abbreviations: CI, confidence interval; SE, standard error; dy/dx, average marginal effect; Ref, reference category.

*P ≤ 0.05

**P ≤ 0.01

***P ≤ 0.001.