

# Characteristics Associated With US Adults' Self-Reported COVID-19 Protective Behaviors When Getting Food From Restaurants, Winter 2021

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## Abstract

**Objectives:** Visiting restaurants and bars, particularly when doing so indoors, can increase transmission risk of SARS-CoV-2, the virus that causes COVID-19, among people who are not fully vaccinated. We aimed to understand US adults' self-reported protective behaviors when getting food from restaurants during the COVID-19 pandemic when vaccines were not widely available.

**Methods:** We used online nationwide survey data from January 2021 to assess self-reported restaurant-related behaviors of respondents (n = 502). We also used multiple logistic regression models to examine associations between respondents' characteristics and these restaurant-related behaviors.

**Results:** Half (49.7%) of respondents reported eating indoors at a restaurant at least once in the month before the survey. Respondents most likely to report eating inside restaurants were in the youngest age category (18-34 y), had personal COVID-19 experience, or indicated they felt safe eating inside a restaurant. Among respondents who had gotten food from a restaurant, more than 65% considered each of the following factors as important in their restaurant dining decision: whether the restaurant staff were wearing face masks, the restaurant requires face masks, other customers are wearing face masks, seating was spaced at least 6 feet apart, someone in their household was at risk for severe COVID-19 illness, and the restaurant was crowded. The most common protective behavior when eating at a restaurant was wearing a face mask; 44.9% of respondents who had eaten at a restaurant wore a face mask except when actively eating or drinking.

**Conclusion:** The need for practicing prevention strategies, especially for those not up to date with COVID-19 vaccines, will be ongoing. Our findings can inform COVID-19 prevention messaging for public health officials, restaurant operators, and the public.

## Keywords

behavioral science, emerging infectious diseases, environmental health, health promotion, public health

COVID-19, caused by the SARS-CoV-2 virus, is spread in 3 main ways: breathing air from an infected person who is exhaling small air droplets and particles containing the virus; having these small virus-containing droplets and particles land on the eyes, nose, or mouth (eg, through sprays from a cough or sneeze); and touching the eyes, nose, or mouth with hands that have the virus on them. People who are closer than 6 feet from an infected person are more likely to become infected than people who are farther away.<sup>1</sup> Furthermore, the risk of SARS-CoV-2 infection increases the longer the interaction lasts or when protective face masks are not worn. The risk of getting COVID-19 from eating or handling food is

considered very low.<sup>2</sup> However, visiting restaurants and bars increases the risk of COVID-19 transmission among people who are not up to date with COVID-19 vaccinations,<sup>3-6</sup> because it can be difficult to maintain physical distancing in

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these spaces and protective face masks must be removed to eat and drink. From spring 2020 through spring 2021, the Centers for Disease Control and Prevention (CDC) stated that the safest way to enjoy and support restaurants and bars was to take out food and eat it at home with people you live with; however, CDC also provided recommendations to reduce the risk of SARS-CoV-2 transmission for people who opted to dine at restaurants.<sup>3</sup> CDC's restaurant dining recommendations included sitting outside, wearing face masks except when eating or drinking, avoiding crowds, and sitting at tables spaced at least 6 feet apart from people you do not live with.

To assess the self-reported adherence to CDC recommendations related to getting food from restaurants, we analyzed national data from an online survey conducted in January 2021, at the height of the winter 2020-2021 surge in the United States, before widespread availability and uptake of vaccines and the summer 2021 Delta variant surge. We also assessed respondents' safety perceptions of restaurant settings and factors that influenced their decisions to eat or not eat at a restaurant during the COVID-19 pandemic. Finally, we examined associations between respondents' characteristics and their self-reported restaurant-related behaviors.

## Methods

During January 12-14, 2021, CDC contracted with Porter Novelli Public Services Inc to conduct an opt-in online survey of US adults aged  $\geq 18$  years. Porter Novelli and ENGINE Insights administered the survey to 502 respondents using the Lucid platform.<sup>7,8</sup> The Lucid platform comprises multiple panel surveys. Survey respondents were selected through quota sampling among a nationwide sample of survey volunteers from multiple panel surveys; people who had not taken a survey in the previous 20 waves of survey administration were eligible to participate. Responses were weighted by sex, age, community type, census region, race and ethnicity, annual household income, employment status, and education to reflect US Current Population Survey proportions.<sup>9</sup> This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy (eg, 45 CFR part 46, 21 CFR part 56; 42 USC §241[d]; 5 USC §552a; 44 USC §3501 et seq).

## Measures

**Respondent characteristics.** We assessed respondents' characteristics (age, sex, race and ethnicity, annual household income, education, community type, and census region). We also assessed respondents' COVID-19 experience with the following survey question: "Which of the following has ever happened to you?" Respondents then answered yes or no to 8 statements. We combined and dichotomized responses to create a COVID-19 experience variable: personal experience (respondents who reported having a positive test result for

COVID-19 or being hospitalized with COVID-19), family or friend severe experience (respondents who reported no personal COVID-19 experience but had a relative or close friend with a severe COVID-19 experience, who was either hospitalized or died), or other experience (respondents who reported no personal or family or friend experience). Details on respondents' COVID-19 experience and categorization are available elsewhere.<sup>10</sup>

**Safety perceptions.** We assessed respondents' perceptions of the safety of restaurant-related activities with the survey question, "Assuming that all tables are spaced at least six feet apart from other tables in restaurants, which of the following statements do you agree with?" Respondents answered yes or no to 8 statements; we combined responses to create a safety perception variable with 3 categories: (1) feel safe eating indoors or outdoors at a restaurant, (2) feel safe only eating outdoors at a restaurant, and (3) don't feel safe eating at a restaurant.

**Methods of getting restaurant food.** To assess the frequency of methods used to get food from restaurants, we analyzed responses to the following survey question: "How often have you engaged in the following activities in the past month?" Respondents answered on a 5-point Likert-type scale (never, rarely, sometimes, often, or all the time) for 8 activities. Five of these activities were related to CDC's recommendation to get take-out food and eat it at home: waiting inside for take-out food, waiting outside for take-out food, curbside pick-up, drive-through pick-up, and home delivery. Two assessed activities met CDC recommendations for those dining at restaurants: eating outdoors at a restaurant and eating outdoors at a restaurant in an enclosure with proper ventilation. Finally, we assessed whether respondents had eaten inside a restaurant.

**Factors shaping restaurant dining decisions.** To assess factors shaping restaurant dining decisions, we asked respondents who reported getting food from a restaurant in the preceding month (in any way except through a drive-through or home delivery) the following survey question: "How important were the following factors in shaping your decision to dine at a restaurant during the COVID-19 pandemic?" Respondents answered on a 5-point Likert-type scale (not at all, slightly, moderately, very, or extremely) for 12 factors. Seven factors were related to CDC recommendations: whether the restaurant requires face masks, whether restaurant staff are wearing face masks, whether other diners are wearing face masks, whether seating is spaced 6 feet or more apart, whether the restaurant is crowded, whether outdoor seating is available, and whether someone in [respondent's] household is at risk for severe COVID-19 illness.

**Protective behaviors when eating at a restaurant.** To assess self-reported protective behaviors practiced at restaurants

among respondents who reported eating at a restaurant in the preceding month, we analyzed responses on a 5-point Likert-type scale (never, rarely, sometimes, often, or always) to the question, “How often do you do the following when eating at a restaurant because of COVID-19 [indoors or outdoors]?” We asked about 8 behaviors: for example, we asked how often respondents ate outdoors in an open space or on a patio, wore a face mask except when eating or drinking, or sat at tables spaced at least 6 feet apart.

### Analysis

We calculated weighted proportions for all variables of interest. We then created 2 multiple logistic regression models: one with the outcome of whether respondents self-reported eating indoors at a restaurant in the preceding month and one with the outcome of whether respondents self-reported always engaging in 3 key protective behaviors while eating at a restaurant: wearing a face mask except when eating or drinking (including when talking to servers), sitting at tables spaced  $\geq 6$  feet apart, and sitting outside (either in an open space or a well-ventilated tent). We created this variable by combining responses from the individual questions assessing these behaviors (always wore face masks, always sat at tables spaced  $\geq 6$  feet apart, and always sat outside vs did not always engage in these 3 behaviors). Explanatory variables for both models were respondent characteristics, safety perceptions, and factors shaping decisions to eat at a restaurant (very or extremely important vs not at all, slightly, or moderately important). The final models contained respondent characteristics as control variables; other explanatory variables were selected via backwards selection by using listwise deletion and Bayesian information criterion. We present those main effects significant at  $P \leq .05$ . We then used Zou’s modified Poisson approach to provide adjusted prevalence ratios (aPRs), along with their corresponding 95% CIs and  $P$  values corrected for multiple comparisons.<sup>11</sup> We used Tukey honestly significant difference methodology to correct for multiple comparisons as applicable. We used SAS version 9.4 (SAS Institute Inc) to conduct all analyses.

### Results

Among the 502 respondents, 51.7% were female, 38.7% had a high school education or less, and 62.8% identified as non-Hispanic White. Almost 8% of respondents reported personal COVID-19 experience, and 24.1% reported having a family member or a friend with severe COVID-19 experience (Table 1).

#### Safety Perceptions

Approximately 40% of respondents said they felt safe eating indoors and outdoors at a restaurant; 22.7% felt safe only eating outdoors at a restaurant, and 37.8% did not feel safe eating at a restaurant (Table 1).

#### Methods of Getting Restaurant Food

At least 60% of respondents said they had obtained take-out food  $\geq 1$  way (eg, picking up food, home delivery) in the preceding month. Thirty-five percent of respondents ate outdoors at a restaurant in an open space, and 40.6% ate outdoors at a restaurant in an enclosure. Altogether, 43.0% of respondents ate outdoors, either in an open space, an enclosure, or both settings. Half (49.7%) of respondents ate indoors at a restaurant in the preceding month (Table 2).

#### Factors Shaping Restaurant Dining Decisions

Among respondents who had gotten food from a restaurant in the preceding month in any way except drive-through and home delivery, more than 65% considered each of the following factors as very or extremely important in their restaurant dining decision: whether the restaurant staff were wearing face masks, the restaurant requires face masks, other customers are wearing face masks, seating was spaced at least 6 feet apart, someone in their household was at risk for severe COVID-19 illness, and the restaurant was crowded (Table 3).

#### Protective Behaviors When Eating at a Restaurant

The most common protective behavior that respondents who had eaten at a restaurant in the preceding month said they always engaged in when eating at restaurants was wearing face masks except when eating or drinking (44.9%). Other protective behaviors taken included wearing a face mask when speaking to servers (40.1%), avoiding self-serve options (35.5%), and sitting at tables spaced  $\geq 6$  feet apart (28.9%; Table 4). Only 10.9% of respondents always sat outdoors in an open space, and only 9.7% always ate outdoors in a well-ventilated tent. Seven percent of respondents always engaged in 3 key protective behaviors when eating at restaurants: wearing a face mask except when eating or drinking, sitting outside, and sitting at tables spaced  $\geq 6$  feet apart.

#### Characteristics Associated With Eating Inside a Restaurant

Multiple logistic regression models identified characteristics significantly associated with respondents who reported eating inside a restaurant at least once in the preceding month: age, COVID-19 experience, safety perceptions, and 3 factors influencing restaurant dining decisions (Table 5). Adults aged 18-34 years had a higher prevalence of eating inside restaurants than adults aged  $\geq 65$  years (aPR = 1.58; 95% CI, 1.03-2.40). Respondents with personal COVID-19 experience had a higher prevalence of eating inside restaurants than respondents who had family or a friend with severe COVID-19 experience (aPR = 1.43; 95% CI, 1.04-1.96). Respondents who felt safe eating inside restaurants

**Table 1.** Self-reported demographic characteristics, COVID-19 experience, and COVID-19 safety perceptions among survey respondents (N = 502), United States, January 2021<sup>a</sup>

Characteristic	No. (weighted % <sup>b</sup> )
Age, y	
18-34	159 (29.4)
35-49	136 (23.5)
50-64	123 (25.4)
≥65	84 (21.8)
Sex	
Female	251 (51.7)
Male	251 (48.3)
Education	
≤High school	162 (38.7)
Some college	75 (15.2)
College	153 (28.0)
Post college	112 (18.1)
Annual household income, \$	
<35 000	158 (35.5)
35 000-<75 000	166 (34.6)
75 000-100 000	54 (10.3)
>100 000	124 (19.6)
Race and ethnicity <sup>c</sup>	
Non-Hispanic White	361 (62.8)
Hispanic	55 (16.7)
Non-Hispanic Black	52 (12.0)
Non-Hispanic other	34 (8.6)
Community	
Rural	99 (20.7)
Suburban	226 (46.8)
Urban	177 (32.5)
Region	
Midwest	102 (20.7)
Northeast	93 (17.3)
South	187 (38.0)
West	120 (24.0)
COVID-19 experience	
Personal experience <sup>d</sup>	41 (7.9)
Family or friend severe experience <sup>e</sup>	119 (24.1)
Other experience <sup>f</sup>	342 (68.0)
Perceived safety <sup>g</sup>	
Feel safe eating indoors and outdoors at a restaurant <sup>h</sup>	205 (39.5)
Feel safe eating outdoors at a restaurant only <sup>i</sup>	119 (22.7)
Don't feel safe eating at a restaurant <sup>j</sup>	178 (37.8)

<sup>a</sup>During January 12-14, 2021, the Centers for Disease Control and Prevention contracted with Porter Novelli Public Services Inc to conduct an opt-in online survey of US adults aged ≥18 years.

<sup>b</sup>All values are unweighted count (weighted %); percentages may not add to 100 because of rounding. Responses were weighted by sex, age, community type, census region, race and ethnicity, annual household income, employment status, and education to reflect US Current Population Survey proportions.<sup>9</sup>

<sup>c</sup>Respondents were asked 2 questions: whether they considered themselves to be of Hispanic/Spanish/Latino descent and what race they considered themselves. We combined the data from these 2 questions

(continued)

**Table 1.** (continued)

to create these categories. The "other" category consisted of Asian, American Indian/Alaska Native, and people who identified as another race or with >1 race.

<sup>d</sup>Had a positive test result for COVID-19 or hospitalized with COVID-19.  
<sup>e</sup>Defined as relative or friend sick or dead from COVID-19.

<sup>f</sup>Defined as been tested for COVID-19; been in close contact (eg, within 6 feet for 15 minutes total in a 24-hour period) with someone who had COVID-19; had any symptom(s) of COVID-19, such as fever/chills, cough, shortness of breath, fatigue, or headache; had a relative or close friend with a positive test result for COVID-19; none.

<sup>g</sup>Feel safe getting restaurant takeout or home delivery is included in all categories.

<sup>h</sup>Defined as feel safe eating indoors at a restaurant and outdoors at a restaurant (on a patio, in a tent or enclosure) alone or with people I live with, or with people I know but don't live with.

<sup>i</sup>Defined as feel safe eating outdoors at a restaurant (on a patio, in a tent or enclosure) alone or with people I live with, or with people I know but don't live with.

<sup>j</sup>Defined as don't feel safe eating in any of the situations described previously.

(aPR = 1.68; 95% CI, 1.36-2.09), compared with respondents who did not feel safe, and respondents who said pressure from friends and family was important (aPR = 1.13; 95% CI, 1.06-1.20), compared with respondents who did not say this was important, had a higher prevalence of eating inside restaurants. Respondents who said whether someone they lived with was at risk for severe COVID-19 illness (aPR = 0.91; 95% CI, 0.85-0.97) and who said that a restaurant's availability of outdoor seating (aPR = 0.88; 95% CI, 0.82-0.94) were important factors shaping their restaurant dining decisions, compared with respondents who did not say these were important factors, had a lower prevalence of eating inside restaurants.

### Characteristics Associated With Protective Behaviors When Eating at a Restaurant

Multiple logistic regression models identified 4 characteristics significantly associated with respondents reporting they always engaged in all 3 protective behaviors when eating at a restaurant (Table 5). Respondents who reported an annual household income of \$35 000 to <\$75 000 had a higher prevalence of always engaging in all 3 protective behaviors than respondents making <\$35 000 (aPR = 4.77; 95% CI, 1.22-18.55). Respondents who said that the number of COVID-19 cases in the community (aPR = 4.47; 95% CI, 1.69-11.78), CDC guidance (aPR = 1.71; 95% CI, 1.02-2.87), and desire to see family and friends (aPR = 1.48; 95% CI, 1.13-1.94) were important factors shaping their restaurant dining decision had a higher prevalence of always engaging in all 3 behaviors compared with those who did not rate these 3 factors as important.

### Discussion

The results of our study show that at the peak of the winter 2020-2021 COVID-19 surge in the United States (mid-January

**Table 2.** Self-reported frequency among survey respondents (N = 502) of restaurant-related activities in the preceding month, United States, January 2021<sup>a</sup>

Activity	Never	Rarely	Sometimes	Often	All the time
Picked up food for takeout from a restaurant and waited inside the restaurant for my food	175 (36.8)	96 (18.9)	139 (27.2)	68 (12.4)	24 (4.6)
Picked up food for takeout from a restaurant and waited outside or did not wait at all for my food	159 (33.4)	80 (16.2)	153 (30.3)	81 (14.6)	29 (5.5)
Picked up food curbside (they brought food out to me) at restaurants	182 (38.9)	76 (14.9)	140 (26.9)	78 (13.9)	26 (5.4)
Picked up food through a drive-through	76 (16.2)	66 (12.7)	168 (34.0)	143 (27.1)	49 (9.9)
Had food delivered from a restaurant to my home	172 (37.4)	79 (15.9)	124 (24.2)	92 (16.1)	35 (6.5)
Ate outdoors at a restaurant in open space	306 (64.9)	63 (12.7)	83 (14.4)	34 (5.4)	16 (2.6)
Ate outdoors at a restaurant in an enclosure (eg, tent)	278 (59.4)	73 (14.8)	87 (15.6)	45 (6.9)	19 (3.3)
Ate indoors at a restaurant	233 (49.7)	91 (17.8)	117 (21.9)	42 (6.9)	19 (3.6)

<sup>a</sup>During January 12-14, 2021, the Centers for Disease Control and Prevention contracted with Porter Novelli Public Services Inc to conduct an opt-in online survey of US adults aged  $\geq 18$  years. All values are unweighted count (weighted %); percentages may not add to 100 across rows because of rounding. Responses were weighted by sex, age, community type, census region, race and ethnicity, annual household income, employment status, and education to reflect US Current Population Survey proportions.<sup>9</sup>

**Table 3.** Self-reported importance ratings among survey respondents (n = 433) of factors in shaping decisions to dine at a restaurant during the COVID-19 pandemic, United States, January 2021<sup>a</sup>

Factor <sup>b</sup>	Importance rating				
	Not at all	Slightly	Moderately	Very	Extremely
Whether restaurant staff are wearing face masks	25 (5.7)	36 (8.5)	64 (14.4)	95 (21.7)	213 (49.8)
Whether the restaurant requires face masks	29 (6.2)	43 (9.5)	61 (14.4)	105 (23.2)	195 (46.7)
Whether other customers are wearing face masks	39 (9.1)	38 (8.3)	67 (16.0)	111 (23.4)	178 (43.3)
Whether seating is spaced $\geq 6$ feet apart	28 (6.0)	43 (10.4)	65 (14.1)	116 (25.9)	181 (43.6)
How crowded the restaurant is	27 (6.1)	41 (10.4)	76 (15.9)	109 (24.6)	180 (43.0)
Whether outdoor seating is available	63 (14.7)	57 (13.7)	97 (22.7)	108 (23.3)	108 (25.6)
The number of COVID-19 cases in the community where the restaurant is located	36 (8.9)	49 (9.9)	92 (21.5)	109 (23.7)	147 (36.0)
Whether someone in my household is at risk for severe COVID-19 illness	29 (6.5)	42 (9.5)	67 (15.7)	93 (19.3)	202 (49.1)
CDC's guidance	40 (9.3)	45 (10.3)	92 (21.5)	118 (24.4)	138 (34.5)
Recommendations from local or state government	50 (11.9)	49 (11.6)	106 (23.6)	92 (20.6)	136 (32.3)
Desire to see family or friends	53 (12.8)	68 (15.5)	129 (30.3)	99 (22.0)	84 (19.5)
Pressure from my family or friends	145 (35.7)	77 (16.8)	101 (23.1)	51 (10.5)	59 (13.9)

Abbreviation: CDC, Centers for Disease Control and Prevention.

<sup>a</sup>During January 12-14, 2021, CDC contracted with Porter Novelli Public Services Inc to conduct an opt-in online survey of US adults aged  $\geq 18$  years. All values are unweighted count (weighted %); percentages may not add to 100 across rows because of rounding. Responses were weighted by sex, age, community type, census region, race and ethnicity, annual household income, employment status, and education to reflect US Current Population Survey proportions.<sup>9</sup>

<sup>b</sup>The following question was asked of respondents who reported getting food in the preceding month from a restaurant in any way except through a drive-through or home delivery: "How important were the following factors in shaping your decision to dine at a restaurant during the COVID-19 pandemic?"

2021), half of respondents had eaten inside restaurants in the preceding month. This proportion is concerning because eating inside restaurants may increase SARS-CoV-2 transmission risk. Given that the link between restaurant dining and acquiring COVID-19 has been widely publicized in US media,<sup>4,6</sup> this finding could demonstrate the importance of restaurant dining to American life.

Multiple factors were associated with respondents eating inside a restaurant, including the perceived safety of doing so, younger age, and having personal COVID-19 experience. Taken together, these factors suggest that risk perceptions play a role in restaurant dining behaviors. As might be expected, respondents who felt safe (ie, perceived less risk) eating inside restaurants were more likely to do so than

**Table 4.** Self-reported frequency among survey respondents (n = 319) of engaging in specific behaviors because of COVID-19 when eating at a restaurant, United States, January 2021<sup>a</sup>

Behavior <sup>b</sup>	Never	Rarely	Sometimes	Often	Always
Ate outdoors in open space or on a patio	74 (25.5)	57 (18.7)	104 (32.0)	47 (13.0)	37 (10.9)
Ate outdoors in a tent with good ventilation (open-air tent, tent with sides raised)	114 (40.3)	42 (12.5)	91 (26.8)	40 (10.7)	32 (9.7)
Wore a face mask except when eating or drinking	23 (7.3)	31 (10.5)	61 (19.2)	60 (18.1)	144 (44.9)
Wore a face mask when speaking to servers	31 (10.5)	26 (7.8)	67 (22.0)	67 (19.6)	128 (40.1)
Sat at tables spaced $\geq 6$ feet apart	22 (7.6)	31 (9.4)	82 (27.0)	88 (27.1)	96 (28.9)
Ate indoors in areas with good ventilation (open windows)	53 (16.8)	54 (17.7)	107 (33.6)	52 (16.4)	53 (15.5)
Ate outdoors in a fully enclosed tent	140 (47.9)	51 (13.1)	72 (21.9)	31 (8.7)	25 (8.4)
Avoided any self-serve food options (buffets)	27 (9.7)	44 (13.6)	68 (21.6)	71 (19.7)	109 (35.5)

<sup>a</sup>During January 12-14, 2021, the Centers for Disease Control and Prevention contracted with Porter Novelli Public Services Inc to conduct an opt-in online survey of US adults aged  $\geq 18$  years. All values are unweighted count (weighted %); percentages may not add to 100 across rows because of rounding. Responses were weighted by sex, age, community type, census region, race and ethnicity, annual household income, employment status, and education to reflect US Current Population Survey proportions.<sup>9</sup>

<sup>b</sup>The following question was asked of respondents who reported eating at a restaurant (inside or outside) in the preceding month: "How often do you do the following when eating at a restaurant because of COVID-19?"

people who did not feel safe. Young people may feel more comfortable than older people in engaging in risky behaviors because they believe that their illness may not be severe if they become infected with COVID-19,<sup>12,13</sup> and those with personal COVID-19 experience may consider themselves immune and feel comfortable engaging in risky behaviors.

Respondents who rated the availability of outdoor seating as important in their restaurant dining decisions (nearly 50%) were less likely to eat inside a restaurant compared with those who did not rate the availability of outdoor seating as important. These findings suggest that customers want to engage in the safer practice of eating outside (vs inside) when dining at restaurants. The relatively large percentage of those eating inside could be related to the time of year the survey was conducted; December and January are not desirable times to be outdoors in many parts of the country, and outdoor eating options may be less available during the winter than they are during other times of the year. Survey data showed that just half of full-service operators offered outdoor dining in November 2020.<sup>14</sup> Time-series data could enhance our understanding of these findings.

The finding that 52% of respondents dined in a fully enclosed tent suggests that some restaurants and respondents may have attempted to lower SARS-CoV-2 transmission risk through alternatives to indoor dining. However, fully enclosed structures without proper ventilation systems may provide a false sense of security among restaurants and their patrons, because these structures do not provide adequate airflow for customers dining with people they do not live with and who are not fully vaccinated; these structures may lack natural ventilation, the lack of which can contribute to SARS-CoV-2 transmission among people who are not fully vaccinated.<sup>15</sup> Improved public health education and risk communication about temporary dining structures may be necessary to help customers and restaurant operators

navigate a spectrum of risk and effectively differentiate between high- and low-risk activities.<sup>16</sup> Future research can explore the nuanced components of public health risk communication, including barriers and facilitators to implementing a multilayered approach to risk reduction in high-risk settings (eg, restaurants), particularly in the context of pandemic fatigue.<sup>17</sup>

The most common CDC-recommended protective behavior in which respondents engaged while eating in restaurants was wearing a face mask. This finding suggests that respondents were aware of the risk associated with dining in restaurants during the pandemic and of CDC's guidance on reducing this risk, although this awareness was likely influenced by state, local, or business face mask mandates. The data on factors important in shaping respondents' dining decisions support this supposition; the top importance factors were related to CDC recommendations (whether restaurant staff were wearing face masks, the restaurant requires face masks, other customers were wearing face masks, seating is spaced  $\geq 6$  feet apart, and the restaurant is crowded). These factors are also within the control of restaurants; restaurants can require and enforce the wearing of face masks, implement seating arrangements, and set capacity limits. These findings suggest that restaurants' implementation of COVID-19 prevention strategies, particularly related to wearing face masks, plays a role in people's restaurant dining decisions during the pandemic. Restaurant operators should be encouraged by these findings, which suggest that their efforts to reduce SARS-CoV-2 transmission risk are noticed.<sup>18</sup>

Study findings on factors associated with respondents' engagement in all 3 key protective behaviors provide further insight. The finding that respondents who said that CDC's guidance was an important factor in their restaurant dining decisions were more likely than respondents who said it was

**Table 5.** Prevalence ratios of characteristics associated with eating inside a restaurant in the preceding month and always engaging in 3 protective behaviors<sup>a</sup> while eating at a restaurant, United States, January 2021<sup>b</sup>

Characteristic	Adjusted prevalence ratio (95% CI) <sup>c</sup>	P value <sup>d</sup>
<b>Outcome was eating inside a restaurant in the preceding month (rarely, sometimes, often, or all the time vs never)<sup>e</sup></b>		
Age group, $\gamma$ ( $P = .003$ ) <sup>d</sup>		
18-34 vs 35-49	1.12 (0.88-1.42)	.64
18-34 vs 50-64	1.25 (0.93-1.69)	.21
18-34 vs $\geq 65$	1.58 (1.03-2.40)	.03
COVID-19 experience <sup>f</sup> ( $P = .048$ ) <sup>d</sup>		
Other experience vs family or friend severe experience	1.16 (0.91-1.47)	.32
Personal experience vs family or friend severe experience	1.43 (1.04-1.96)	.02
Personal experience vs other experience	1.24 (0.95-1.61)	.14
Perceived safety ( $P < .001$ ) <sup>d</sup>		
Feel safe eating indoors and outdoors at a restaurant vs feel safe eating outdoors at a restaurant only	1.27 (1.02-1.58)	.04
Feel safe eating indoors and outdoors at a restaurant vs don't feel safe eating at a restaurant	1.68 (1.36-2.09)	<.001
Importance factors		
Whether outdoor seating is available was an important factor (vs not important) in influencing decision to eat at a restaurant <sup>d,g</sup>	0.88 (0.82-0.94)	<.001
Pressure from friends and family was an important factor (vs not important) in influencing decision to eat at a restaurant <sup>d,g</sup>	1.13 (1.06-1.20)	<.001
Whether someone in my household is at risk for severe COVID-19 illness was an important factor (vs not important) in influencing decision to eat at a restaurant <sup>d,g</sup>	0.91 (0.85-0.97)	.004
<b>Outcome was always engaging in all protective behaviors (always vs never, rarely, sometimes, or often)<sup>h</sup></b>		
Annual household income, \$ ( $P = .049$ ) <sup>d</sup>		
35 000 to <75 000 vs <35 000	4.77 (1.22-18.55)	.02
35 000 to <75 000 vs 75 000 to <100 000	6.10 (0.95-39.30)	.06
35 000 to <75 000 vs $\geq 100 000$	2.83 (0.53-15.14)	.38
Importance factors		
CDC's guidance was an important factor (vs not important) in influencing decisions to eat at a restaurant <sup>d</sup>	1.71 (1.02-2.87)	.04
The number of COVID-19 cases in the community where the restaurant is located was an important factor (vs not important) in influencing the decision to eat at a restaurant <sup>d,g</sup>	4.47 (1.69-11.78)	.003
Desire to see family or friends was an important factor (vs not important) in influencing the decision to eat at a restaurant <sup>d,g</sup>	1.48 (1.13-1.94)	.005

Abbreviation: CDC, Centers for Disease Control and Prevention.

<sup>a</sup>Wearing a face mask except when eating or drinking, sitting at tables spaced  $\geq 6$  feet apart, and sitting outside.

<sup>b</sup>Data source: during January 12-14, 2021, CDC contracted with Porter Novelli Public Services Inc to conduct an opt-in online survey of US adults aged  $\geq 18$  years.

<sup>c</sup>Tukey honestly significant difference methodology was used to correct for multiple comparisons as applicable.

<sup>d</sup>P value determined by multiple logistic regression;  $P < .05$  considered significant.

<sup>e</sup>Among the 433 respondents who reported getting food in the preceding month from a restaurant in any way except through a drive-through or home delivery.

<sup>f</sup>Personal experience defined as having had a positive test result for COVID-19 or been hospitalized with COVID-19. Family or friend severe experience defined as relative or friend sick or dead from COVID-19. Other experience defined as having been tested for COVID-19; been in close contact (eg, within 6 feet for 15 minutes total in a 24-hour period) with someone who had COVID-19; had any symptom(s) of COVID-19, such as fever/chills, cough, shortness of breath, fatigue, or headache; had a relative or close friend with a positive test result for COVID-19; none.

<sup>g</sup>Very or extremely important vs not at all, slightly, or moderately important.

<sup>h</sup>Among the 319 respondents who reported eating at a restaurant (inside or outside) in the preceding month.

not important to always engage in these key protective behaviors suggests that the public is aware of and influenced by CDC's public health messaging on COVID-19 prevention. The finding that those who said that the number of COVID-19 cases in the community was an important factor in their dining decisions were more likely than respondents who said it was not important to always engage in these key protective

behaviors supports this supposition. Finally, the finding that a considerably higher percentage of respondents always engaged in each key protective behavior (44.9% wore face masks, 28.9% sat at spaced tables, 20.6% ate outside) than always engaged in all 3 behaviors together (7.3%) suggests that it may be more difficult to simultaneously engage in multiple protective behaviors than in 1 or 2 behaviors.

## Limitations

This study had several limitations. First, although survey data were collected from a nationwide panel and weighted to match current US population proportions, results from this study may not be representative of the broader US population because of nonprobability sampling and a poor response rate (31.5%). Second, the data might have been affected by social desirability bias, which might have resulted in overreporting of socially desirable responses (eg, face mask wearing). Third, these data measured self-reported practices, not actual or observed practices, which might have resulted in underreporting or overreporting of practices. Fourth, we did not assess local and state mandates that may have affected restaurant behaviors. Fifth, we did not capture the total number of times respondents ate at restaurants or whether they ate with others because this study was not designed to determine whether respondent characteristics and engagement in protective behaviors differed between respondents who ate out more frequently or with others; these factors are related to increased COVID-19 risk. Finally, these data describe differences in self-reported practices by respondent characteristics; they do not allow causal inferences about reasons for those differences.

## Conclusion

The need for continued practice of prevention measures and protective behaviors will be ongoing and is particularly important among people who are not up to date with COVID-19 vaccinations, in settings with a high risk of transmission, and during activities that disproportionately contribute to the spread of COVID-19.

Findings from this study can provide insight for restaurant operators and public health officials on prevention measures and protective behaviors that are important to, and commonly practiced by, customers when dining out during the COVID-19 pandemic. Results can inform future preparedness and response efforts in preventing infectious respiratory diseases. Furthermore, despite COVID-19 vaccination becoming widespread since our survey was fielded in January 2021, our findings remain relevant. Dining at a restaurant still presents a risk of COVID-19 infection because face masks are removed to eat and drink, especially in areas where the number of COVID-19 cases in the community is high. As of April 2022, face masks were still recommended by CDC in communities with a high number of COVID-19 cases, regardless of the vaccination status of community members, to reduce COVID-19 transmission. Improved public health education and risk communications that facilitate sensible and effective use of prevention strategies could reduce pandemic-related fatigue and risk of transmission in settings and during activities known to disproportionately contribute to spread. Effective implementation of strategies known to reduce the spread of COVID-19 can help provide a safeguard for public health, the economy, restaurant workers,

and customers. Future research and public health efforts should focus on addressing barriers to and facilitators of safe dining, for both restaurants and customers, particularly in colder months and climates—which could have positive effects on human health and the economy during current and future pandemics.

## Disclaimer

The findings and conclusions in this article are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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