

1 **Title:** Food Insecurity in Households of People with Autism Spectrum Disorder during the
2 COVID-19 Pandemic

3 Vijay Vasudevan¹, Arun Karpur¹, Andy Shih¹, and Thomas Frazier^{1,2}

4 1. Autism Speaks, Princeton, NJ

5 2. Department of Psychology, John Carrol University, University Heights, OH

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7 Abstract:

8 Objectives: To explore differences in food insecurity for individuals and families of people with
9 autism spectrum disorder (ASD) during the COVID-19 pandemic by individual, family, and
10 neighborhood characteristics.

11 Methods: We surveyed a convenience sample of households of people with ASD. We calculated
12 food insecurity using items from the US Census Bureau's Household Pulse Survey..

13 Results: Over half of all respondents reported being food insecure (51.8%). Respondents who
14 reported being food insecure were more likely to be minority, have a high school education or
15 less, be on public insurance or uninsured, live in urban/rural communities, and say that their
16 community is not supportive. The majority of respondents did not get free food or groceries
17 (53.2%). Food insecure respondents who got free food was most likely to get them from schools
18 (34.2%).

19 Conclusion: This is the first study of its kind to explore food security in households of people
20 with ASD. The pandemic has exacerbated existing neighborhood disparities. The federal
21 response to food insecurity caused by the pandemic needs to be further explored especially for
22 preferred and medically necessary foods for people with ASD.

23

24 INTRODUCTION

25 The US Department of Agriculture (USDA) defines food insecurity when a household's "access
26 to adequate food is limited by a lack of money and other resources."¹ Prior to the coronavirus
27 disease 2019 (COVID-19) pandemic, 13.6% of all households with children were food insecure,
28 with 6.5% of children facing food insecurity (~2.4 million households).¹ People with disabilities
29 and households of individuals with autism spectrum disorder (ASD) were at a greater risk for
30 food insecurity when compared to the general population.^{2,3} Studies have demonstrated the short-
31 and long-term physical and mental health impacts of food insecurity.⁴ According to the US
32 Census Bureau's Household Pulse Survey (which asks how the coronavirus pandemic is
33 impacting households), 18.3% of households with children experienced food insufficiency in the
34 last seven days.⁵

35 The coronavirus pandemic has greatly exacerbated food insecurity.⁶ Leddy et al. illustrated how
36 the COVID-19 pandemic (1) built on pre-existing disparities, (2) introduced its own stressors, (3)
37 how food insecurity impacted household stress, behavioral, and inflammatory pathways, (4)
38 impacted the physical and mental health outcomes, and (5) had a feedback loop back to the
39 previous levels.

40 It is unclear how many households of individuals with ASD are included in the current food
41 insecurity estimates during the COVID-19 pandemic. Therefore, the purpose of this study is to
42 provide an initial estimate for food insecurity for households with someone with ASD by
43 different individual, family, and neighborhood characteristics.

44 METHODS

45 This study was approved as exempt by the Institutional Review Board at [insert name of author's
46 IRB]. This study used a convenience national sample, anonymous online survey from November
47 18, 2020 through December 7, 2020.

48 Food insecurity items were modified from the Household Pulse Survey specifically for
49 households with someone with ASD.⁵ We then coded the responses into food secure, food
50 insecure, and very low food security based on the USDA's definitions.¹ We modified the items
51 to ask if anyone in the household received free food or groceries from a list of seven options such
52 as school, church, or food bank. We asked about approximate annual income and family size to

53 estimate Federal Poverty Level (FPL). Neighborhood quality items were modified from the
54 National Survey of Children’s Health.⁷ Self-reported physical and mental health items were
55 modified from the Behavioral Risk Factor Surveillance System.⁸

56 We collapsed food insecurity into a dichotomous variable where food insecure and very low food
57 security being coded as food insecure. Frequency and chi-square analyses were performed to
58 explore differences in food security status. Significance was set at alpha equal to 0.05 a priori.
59 Frequency of where food insecure respondents for free groceries or meals were performed.

60 **RESULTS**

61 This study had respondents (n=1515) from 48 states and the District of Columbia (excluding
62 Wyoming and South Dakota) with over 21% of the respondents from New York and California.
63 Parents and guardians of people with ASD accounted for a majority of the respondents (89.2%),
64 with autistic adults accounting for the remainder of respondents. The majority of respondents
65 were between 35 and 54 years old (57.1%), female (85.4%), White, non-Hispanic (65.0%), had
66 more than a high school education (65.1%), had greater than 200% FPL (55.9%), lived in a
67 suburban environment (52.9%), and do not live in a supportive neighborhood (89.1%). Nearly
68 two-thirds of all respondents (62.4%) reported that the COVID-19 pandemic impacted their
69 family “a lot.” Finally, over half of all respondents reported some food insecurity (19.5%
70 reported being “food insecure” and 32.3% reported “very low food security”).

71 There was no significant difference for food insecurity by Census region. The region with the
72 highest rate of food insecurity was the South (34.8%) followed by the Northeast (24.1%), West
73 (23.1%) and Midwest (17.9%). Table 1 presents the comparison of respondents reporting being
74 “food secure” compared to either “food insecure.” Respondent gender was the only variable
75 which did not significantly associate with food security status.

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77 **INSERT TABLE 1 HERE**

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79 A majority of respondents who were food insecure did not receive any free groceries or free
80 meals (53.2%). Respondents who were food insecure who received free meals or groceries got

81 them from schools (34.2%), followed by a food bank or pantry (25.6%), family/friends (21.8%),
82 community program (15.2%), or church/synagogue/religious institution (12.2%).

83 **DISCUSSION**

84 This is the first known study of its kind to assess food insecurity from a sample of households
85 with people of ASD. The major finding was that the COVID-19 pandemic increased food
86 insecurity for families with ASD and makes them vulnerable to physical and mental health
87 impacts. Food insecurity during the COVID-19 pandemic was impacted at the individual-,
88 family-, and neighborhood-level.

89 Since the pandemic, the United States implemented a mixture of federal responses to address the
90 economic disparities and subsequent food insecurity.⁹ Despite the federal response, food
91 insecurity is a still a threat to the country. President Biden recently signed an Executive Order
92 expanding food assistance programs like SNAP and the Pandemic Electronic Benefits Transfer
93 for children who are missing meals due to school closures.¹⁰ During the pandemic, schools
94 offered a combination of in-person and online education, therefore it is imperative to understand
95 how students with ASD and their families receive food during this period including preferred
96 foods and accommodations for necessary allergies.¹¹ Subsequently, when the school are closed,
97 for pandemic reasons or the students need to quarantine, researchers and policy makers need to
98 create safety nets for families of people with ASD to make sure that the students and their
99 families have access to the preferred and medically necessary food. Future studies need to
100 explore how these policy and future initiatives impacts food insecurity for families of people
101 with ASD.

102 When compared to Census geographic regions¹, families of people with ASD reported more food
103 insecurity during the coronavirus pandemic regardless of region. The pandemic has made the
104 food system within the United States even more vulnerable for families of people with ASD.
105 With food deserts and their accompanying health risks being well established and well-known,¹²
106 this study revealed that a greater percentage of families of people with ASD living in urban or
107 rural environments were more likely to report being food insecure than people living in suburban
108 communities. Additionally, respondents who reported living in neighborhoods that were not
109 supportive were more likely to report being food insecure than families being food secure. One

110 aspect that needs to be further explored is what role Race/Ethnicity plays at the intersection of
111 neighborhood, food environments, and food insecurity during the pandemic.

112 This study has two primary limitations. Firstly, the study used a convenience sample of families
113 of people with ASD and was not representative of households of people with ASD. The second
114 limitation was that this study did not use the full 18 USDA food insecurity item set. Despite
115 these limitations, this study establishes a baseline estimate of food insecurity for households of
116 people with ASD during the COVID-19 pandemic.

117 **Public Health Implications**

118 Food insecurity has long term ramifications and the COVID-19 pandemic has made its effects
119 much more prevalent especially for households of people with ASD. For people with ASD and
120 their families, food insecurity could have additional impact on their physical and mental health
121 status. Policy makers should consider strategies to improving access to preferred and medically
122 necessary food. Additional efforts should be undertaken to improve community design especially
123 at the intersection of neighborhood, race, and disability status.

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Table 1: Food Insecurity Status by Individual and Neighborhood Characteristics

	Food secure	Food insecure
Age of respondent***		
Less than 45 years old	40.2%	59.8%
45 years old or older	59.2%	40.8%
Gender		
Female	47.8%	52.2%
Male	51.8%	48.2%
Race***		
White, non-Hispanic	56.2%	43.8%
Black, non-Hispanic	34.3%	65.7%
Hispanic	25.5%	74.5%
Education***		
High school graduate or less	28.8%	71.2%
More than high school	58.6%	41.4%
Federal Poverty Level***		
Less than or Equal to 200% FPL	20.0%	80.0%
Greater than 200% FPL	64.1%	35.9%
Received SNAP benefits***		
Did not receive SNAP	60.1%	39.9%
Received SNAP	26.3%	73.7%
Insurance coverage for child with ASD***		
Any Private (includes dual eligible)	67.1%	32.9%
Public only (Medicaid/Medicare)	30.1%	69.9%
Uninsured	32.5%	67.5%
Level of support for child with ASD***		
A little to no support	56.5%	43.5%
A medium amount of support	50.9%	49.1%
A lot of support	41.3%	58.7%
Respondent self-reported physical health***		
Excellent, Very good, or Good	54.6%	45.4%
Fair, or Poor	34.8%	65.2%
Respondent self-reported mental health***		
Excellent, Very good, or Good	56.5%	43.5%
Fair, or Poor	41.5%	58.5%
Neighborhood***		
Urban	35.1%	64.9%
Suburban	58.7%	41.3%
Rural	37.9%	62.1%
Neighborhood supportiveness**		
Lives in supportive neighborhood	59.6%	40.4%
Does not live-in supportive neighborhood	46.7%	53.3%
Level of coronavirus pandemic impact***		
Not at all, Very little, or Somewhat	57.4%	42.6%
A lot	42.7%	57.3%

** p < 0.01, *** p < 0.001

