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COVID-19 Infection and Mitigation for Young Children With Autism and Other Disabilities

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Abstract

Objective: This study investigated prevalence of positive tests for COVID-19 infection and difficulties with mitigation strategies among young children with autism spectrum disorder (ASD) and other developmental disabilities (DD) compared with children from the general population (population comparison group [POP]).

Methods: Before the pandemic, children aged 2 to 5 years in the Study to Explore Early Development (SEED) completed a developmental assessment assigning them to a study group (ASD, other DD, or POP). Caregivers were recontacted in 2021 to complete a questionnaire assessing the impact of the pandemic in 2020 when children were aged 3 to 8 years. Modified Poisson regression models assessed the relationship between study group and difficulty with mitigation strategies and nasal swabbing.

Results: Caregivers of 1027 SEED participants completed the survey. Prevalence of having 1 or more positive COVID-19 tests was 3 times higher for children in the ASD and DD groups versus the POP group. In adjusted models, children in the ASD group were more likely to have difficulty with all 3 mitigation strategies and nasal swabbing compared with children in the POP group. The DD group were more likely than the POP group to experience difficulty with handwashing and physical distancing.

Conclusion: Compared with the general population, youth with ASD and DD were more likely to have at least 1 positive COVID-19 test and difficulty following mitigation strategies. These findings underscore the importance of supporting youth with ASD and DDs in anticipation of future public health emergencies and the annual respiratory disease season.

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Keywords

Index terms: COVID-19; autism spectrum disorder; developmental disabilities; infection mitigation

INTRODUCTION

Accumulating evidence since the onset of the coronavirus disease 2019 (COVID-19) pandemic has demonstrated that adults with autism spectrum disorder (ASD) face increased risk for infection and worse health outcomes if infected.¹⁻⁵ Although evidence also suggests that children with ASD and other developmental disabilities (DD) have poorer health outcomes associated with COVID-19 infection,^{6,7} few studies have evaluated whether youth with ASD and other DD are also at increased risk for initial COVID-19 infection. One study leveraged a large health record dataset from Israel and identified increased odds of infection for autistic youth ages 0 to 16 years, although no significantly increased risk for hospitalization.¹ Another study compared the prevalence of COVID-19 infection among youth age ≤ 19 years from the South Korean National Health Insurance Service⁸; the overall prevalence of COVID-19 was lower among youth with ASD compared with neurotypical peers, but when stratified by age, it was higher among children with ASD in the 0 to 4 years age group. Although ample evidence suggests that youth with ASD were more vulnerable to pandemic-related disruptions in critical supports such as dental care, health care, and educational and daycare services than youth with other disabilities,⁹⁻¹¹ evidence related to COVID-19 mitigation and infection risk is still lacking in this population.

During the pandemic, the Centers for Disease Control and Prevention (CDC) and other public health entities engaged in widespread education efforts focused on key mitigation behaviors to reduce risk of infection, including handwashing/sanitization, the use of masks that cover the nose and mouth, and physical distancing at least 6 feet from others.^{12,13} Some reports suggest that children with ASD often had difficulty adhering to these mitigation strategies, amplifying concerns for possible increased infection risk. In a survey of parents of youth and young adults with ASD, Mutluer et al.¹¹ found that many reported that their child did not understand much about COVID-19 (58%), was not able to follow COVID-19 prevention measures like keeping physical distance and staying at home (45%), and experienced sensory problems when using disinfectants, washing hands, or wearing masks (37%). Similarly, Stadheim et al.¹⁴ found in a qualitative analysis that parents of youth with ASD reported themes of their children struggling to accept the “new normal” of restrictions. Although informative, these and similar studies did not include a comparison group of parents of children without ASD, making it unclear the extent to which difficulties with COVID-19 mitigation efforts affected children with ASD compared with children who were typically developing or with other developmental disabilities.

To address these gaps, the goals of this study were (1) to investigate positive tests for COVID-19 infection reported in a large, well-characterized sample of young children with ASD, with other DD, and those selected as a population comparison group (POP); and (2) to compare the groups regarding prevalence of difficulties experienced with COVID-19

mitigation strategies. Specifically, we sought to examine both individual and combined difficulties with handwashing, masking, and physical distancing, and the key health behavior of nasal swabbing (required for COVID-19 testing).

METHODS

Data from the Study to Explore Early Development—Phase 3 (SEED3) and the SEED3 COVID-19 Impact Assessment were used for these analyses. SEED3 is a Centers for Disease Control and Prevention (CDC) funded multisite case-control study of the risk factors and behavioral characteristics associated with autism spectrum disorder (ASD) in early childhood. Three groups of children between 2 to 5 years of age were recruited: children diagnosed with ASD, children diagnosed with a DD other than ASD, and children from a population comparison group (POP). Children with ASD and other DD were recruited from clinic and education partners at each study site and children in the POP group were selected randomly from state vital records.

All children received a Social Communication Questionnaire (SCQ) and participated in a developmental evaluation; those who demonstrated ASD risk (SCQ score ≥ 11) received 2 gold-standard ASD diagnostic measures administered by research-reliable clinicians. After the evaluation, children were placed into 3 study groups based on the results of the developmental evaluation: ASD, other DD, and POP. A complete description of SEED methods and study classification procedures can be found in Schendel et al.¹⁵ and Wiggins et al.¹⁶ SEED3 was reviewed and approved by the CDC and local site Institutional Review Boards (IRBs).

COVID-19 Impact Assessment

In March 2020, SEED3 recruitment and clinic assessment activities were discontinued in accordance with COVID-19 mitigation strategies. To learn how the pandemic affected SEED3 families, a survey was developed that asked families about the impact of the pandemic and resulting mitigation policies and practices on a variety of domains, including child behaviors; access to developmental, health, and educational services; and emotional, financial, and physical health. The SEED3 COVID-19 Impact Assessment was approved as an amendment to the SEED3 protocol by the CDC IRB and the local site IRBs.

Enrollment for the COVID-19 Impact Assessment was conducted between January and June 2021. Participants were recruited from SEED3 families who met the following criteria: (1) completed the SEED3 study protocol before March 31, 2020; (2) received a final classification of ASD, other DD, or POP; and (3) consented to be contacted for future studies. Survey questions related to the study child's experience with COVID-19 infection and mitigation strategies were the focus of this analysis. Caregivers were asked "In 2020, did the study child ever experience distress, resistance, or anxiety related to (1) wearing a mask, (2) receiving a nose swab during coronavirus disease 2019 (COVID-19) testing, (3) social distancing or staying 6 feet away from others, and (4) handwashing." Response options were "yes," "no," "not applicable." Caregivers were also asked whether the study child had ever been tested for COVID-19 (yes/no) and whether the study child ever had a positive COVID-19 test (possible responses options were "yes," "no," and "still waiting for results").

Of note, vaccines against the SARS-CoV-2 virus were not approved for use in children until October 2021.

We created a composite mitigation strategy variable that contained the total number of mitigation strategy difficulties that were endorsed by respondents. Possible values ranged from 0 to 3. Difficulty with nasal swab related to COVID-19 testing was not included in the composite variable because of the high number of “not applicable” responses.

Statistical Analysis

Chi-squared tests were used to compare the frequency of endorsing COVID-19 testing, positive COVID-19 test result, and difficulty with the 3 separate COVID-19 mitigation strategies, composite mitigation variable, and difficulty with nasal swabbing for ASD, other DD, and POP respondents. A p -value of less than 0.05 was considered statistically significant.

Modified Poisson regression models were used to assess the relationship between case group (ASD, other DD, and POP) and endorsement of difficulty with mitigation strategies (handwashing, masking, and physical distancing) and nasal swabs related to COVID-19 testing. Separate models were created for each mitigation variable. Multivariable models were adjusted for the race/ethnicity and sex of the study child, household income relative to the federal poverty threshold, and study site. Both crude and adjusted prevalence ratios (PRs) and 95% confidence intervals (CIs) were calculated for the association between case group (POP as referent group) and each mitigation strategy variable. All analyses were conducted using R statistical software (v.4.3.1, R Core Team 2023).

RESULTS

A total of 1027 SEED3 participants (autism spectrum disorder group [ASD] = 274, other DD = 368, population comparison group [POP] = 385) completed the SEED COVID-19 Impact Assessment. Characteristics of the sample are provided in Table 1. A larger percentage of ASD as compared with other DD and POP respondents reported they were from a race/ethnicity group other than non-Hispanic White, caregivers of male study children, and from households with lower household incomes relative to the federal poverty level.

Table 2 contains a summary of survey responses to questions related to COVID-19 mitigation strategies and COVID-19 testing and results. A similar percentage of respondents in the ASD (36%), other DD (39%), and POP groups (36%) ($p = 0.580$) indicated the study child ever received a COVID-19 test. However, the prevalence of having 1 or more positive test for children in the ASD and other DD groups was approximately 3 times higher (11% and 13%, respectively) than for children in the POP group (<5%) ($p = 0.032$).

Among the entire sample of children, physical distancing was the most frequently endorsed mitigation challenge (45%) followed by masking (39%) and handwashing (21%). For the question related to COVID-19 nasal swabbing, we restricted the sample to children who had a COVID-19 test and answered yes or no to difficulties with nasal swabbing ($n = 365$).

Of those, 68% endorsed the study child had difficulty with a COVID-19 test nasal swab. A greater percentage of the ASD group endorsed difficulty for each individual mitigation measure and nasal swabbing compared with the other DD and POP groups. In addition, a greater percentage of the ASD group endorsed difficulty with 2 or more of the 3 mitigation measures (Table 2). Over half (53%) of the POP group endorsed no mitigation measure difficulties compared with 42% for the other DD group and 21% for the ASD group. Conversely, 22% of ASD respondents reported difficulties with all 3 mitigation measures compared with 11% among other DD respondents and 5% among POP respondents (Fig. 1).

We calculated both unadjusted and adjusted prevalence ratios (PRs) for difficulty with each mitigation measure and nasal swabbing for ASD and other DD compared with POP (Supplemental Digital Content 1, <http://links.lww.com/JDBP/A507>, which provides unadjusted and adjusted PRs for mitigation measure difficulty and study group). In adjusted models, controlling for child's race, sex, household income relative to the Federal Poverty Level, and study site, both ASD and other DD children were more likely to have difficulty with physical distancing and handwashing compared with POP children. Children with ASD (aPR = 2.29 [1.89–2.78]) were more likely to have difficulties with masking compared with children in the POP group. Children with ASD were more likely than POP children to have difficulty with nasal swabs related to COVID-19 testing (aPR = 1.54 [1.26–1.88]) but the other DD and POP groups reported similar levels of difficulty with nasal swabs (Fig. 2).

DISCUSSION

We believe our data are the first from the United States to document higher prevalence of at least 1 positive COVID-19 test in young children with autism spectrum disorder group (ASD) and other developmental disabilities (DD) compared with the general population, and the first ever examination of comparative COVID-19-positive test prevalence in a large, diverse sample characterized by direct developmental assessment. We found the prevalence of at least 1 positive COVID-19 test during 2020 among young children with ASD and other DDs was approximately 3 times that reported by caregivers in the population comparison group (POP) group. This finding in young children is consistent with the literature in adults suggesting an increased risk for COVID-19 infection with developmental disabilities.³

Our finding of higher prevalence of 1 or more positive COVID-19 test among young children with ASD and other DD provides indirect evidence that children with developmental conditions may be at increased risk for COVID-19 infection, bolstering the importance of recommendations for targeted respiratory illness prevention and mitigation strategies specifically for youth with ASD and other DD.^{17,18} Infection prevention in this population is particularly important given the evidence that children with developmental conditions that contract COVID-19 have poorer outcomes,¹⁹ and the importance of helping youth with disabilities maintain access to critical educational and therapeutic settings.^{18,20,21}

The existing COVID-19 literature generally references infection mitigation challenges experienced by individuals with disabilities^{17,22}; however, the current analysis is the first to quantitatively demonstrate the challenges experienced with COVID-19 infection mitigation strategies for youth with developmental disabilities, and especially those with ASD.

Compared with caregivers in the other DD and POP groups, caregivers of children with ASD were more likely to endorse that their children experienced 2 or more mitigation challenges. In addition to the considerations raised by these data in anticipation of future public health emergencies, our findings also suggest opportunities for supporting the health of youth with ASD and other DD in relation to seasonal illnesses (e.g., COVID-19, influenza, respiratory syncytial virus). Training approaches to improve infection mitigation behaviors like masking that emerged during the early pandemic²²⁻²⁶ continue to be important in infection prevention, particularly in settings and programs focused on improving health behaviors. Especially for youth with additional risk factors in addition to their developmental disability, routine and anticipatory coaching to improve mitigation adherence among children with ASD and other DD may have substantial benefit. This training could also be embedded in school-based individualized education programs, disseminated in primary care, and through tertiary care developmental disability providers. Increasing awareness of the potential for increased infection risk and heightened disease severity will be a key component to motivate both providers and families to support this type of training. More robust research is needed to ensure that infection mitigation coaching programs are effective and can be successfully implemented in school and community-based settings.

Strengths of our study include the use of a large, diverse sample of youth who were directly evaluated for ASD (vs identified administratively by health records). We also were able to include comparison groups of youth with other DD and youth from the general population. Several limitations should be noted, including the potential selection bias among participants in SEED3 and the subsequent COVID-19 survey. The distributions of variables including race/ethnicity, child's sex, and family income were not balanced across the 3 groups, and despite adjusting for these variables in our models, it is possible that residual confounding could have affected our findings.

Although other large-scale reports on COVID-19 use similar methodologies, another limitation is the reliance on caregiver report for the infection and mitigation variables used in this analysis. Respondents were asked about events and behavior that occurred up to a year before completing the survey, which could diminish accuracy of recall. In addition, respondents could only respond "yes" or "no" to the mitigation difficulty questions. Future investigations should seek more information about the contexts and extent of the experienced difficulties and ideally collect data contemporaneously to minimize recall bias. Relatively few respondents endorsed at least 1 positive COVID-19 test for the study child, which prevented us from adjusting the association between at least 1 positive COVID-19 test and study group for potential confounding variables. Finally, we did not have data on the total number of COVID-19 tests administered per child, and therefore, we could not calculate and compare cumulative COVID-19 test positivity or test positivity rates across the 3 groups. The percentage of caregivers reporting that their child received at least 1 COVID-19 test was similar (36%–39%) for all 3 groups, but this might obscure differences in the total number of tests used, reflect the availability of tests when data were collected, and/or be a function of other unmeasured factors.

CONCLUSION

In summary, in a large-scale examination of COVID-19 infection for young children with autism spectrum disorder (ASD) group and other developmental disabilities (DD) in the United States, we found that the prevalence of having at least 1 positive COVID-19 test was 3 times higher for young children with ASD or other DD compared to the POP group. We also found that children with DD and ASD had a significantly higher prevalence of difficulties with key infection mitigation strategies compared with children from the general population. Health care providers, educational professionals, and policy makers can maintain awareness of these disparities and pursue opportunities to accommodate and support youth with disabilities and their families to improve mitigation effectiveness.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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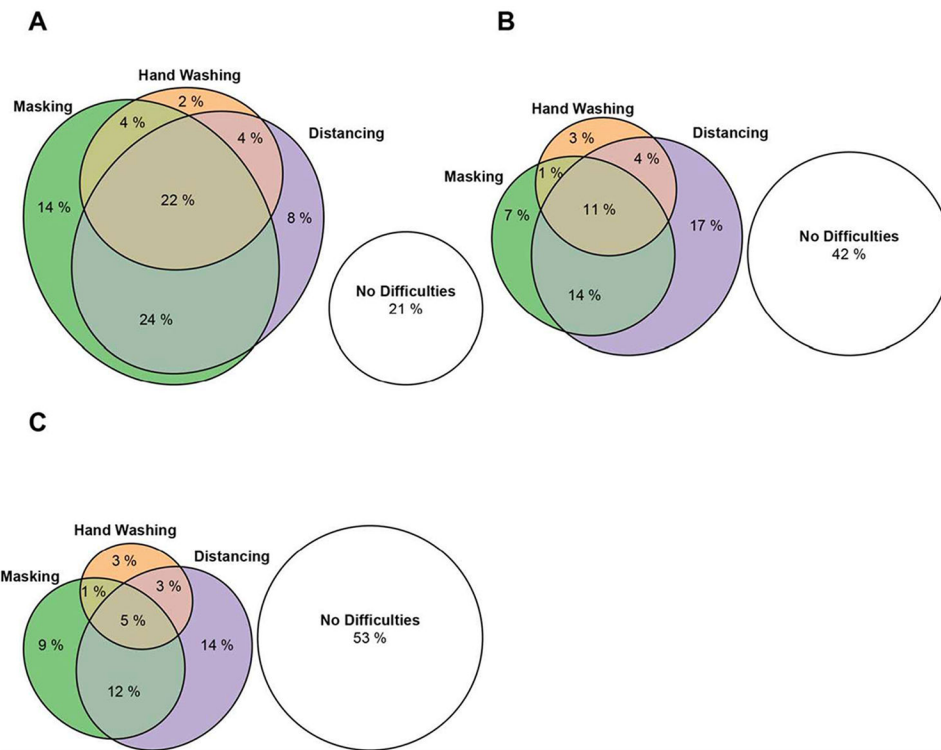
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REFERENCES

1. Krieger I, Erez G, Weinstein O, et al. COVID-19 morbidity among individuals with autistic spectrum disorder: a matched controlled population-based study. *J Autism Dev Disord*. 2023;53:789–794. [PubMed: 34240292]
2. Koyama AK, Koumans EH, Sircar K, et al. Severe outcomes, readmission, and length of stay among COVID-19 patients with intellectual and developmental disabilities. *Tnt J Infect Dis*. 2022;116:328–330.
3. Schott W, Tao S, Shea L. COVID-19 risk: adult medicaid beneficiaries with autism, intellectual disability, and mental health conditions. *Autism*. 2022;26:975–987. [PubMed: 34420427]
4. Karpur A, Vasudevan V, Shih A, et al. Brief report: impact of COVID-19 in individuals with autism spectrum disorders: analysis of a national private claims insurance database. *J Autism Dev Disord*. 2022;52:2350–2356. [PubMed: 34041682]
5. Scheeren AM, Crane L, Heyworth M, et al. Impact of the COVID-19 pandemic on autistic adults: a scoping review. *Curr Dev Disord Rep*. 2023;10:92–122. [PubMed: 36741810]
6. Turk MA, Landes SD, Formica MK, et al. Intellectual and developmental disability and COVID-19 case-fatality trends: trinetx analysis. *Disabil Health J*. 2020;13:100942. [PubMed: 32473875]
7. Kompaniyets L, Agathis NT, Nelson JM, et al. Underlying medical conditions associated with severe COVID-19 illness among children. *JAMA Netw Open*. 2021;4:e2111182. [PubMed: 34097050]
8. Yun J, Kang B, Lee JR, et al. Prevalence and severity of COVID-19 among children and adolescents with autism spectrum disorders in the Republic of Korea. *Autism*. 2023;27:2397–2406. [PubMed: 36935608]

9. Pazol K, Tian LH, Diguseppi C, et al. Health and education services during the COVID-19 pandemic among young children with autism spectrum disorder and other developmental disabilities. *J Dev Behav Pediatr.* 2024;45:e31–e38. [PubMed: 38364085]
10. Wiggins LD, Tian LH, Tinker SC, et al. Remote delivery of allied and behavioral healthcare during COVID-19 for children with developmental disabilities. *JAACAP Open.* 2024;2:36–44. [PubMed: 38533351]
11. Mutluer T, Doenyas C, Aslan Gene H. Behavioral implications of the COVID-19 process for autism spectrum disorder, and individuals' comprehension of and reactions to the pandemic conditions. *Front Psychiatry.* 2020;11:561882. [PubMed: 33304279]
12. Schuchat A, CDC COVID-19 Response Team. Public health response to the initiation and spread of pandemic COVID-19 in the United States, February 24–April 21, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69:551–556. [PubMed: 32379733]
13. Hutchins HJ, Wolff B, Leeb R, et al. COVID-19 mitigation behaviors by age group — united States, April–June 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69:1584–1590. [PubMed: 33119562]
14. Stadheim J, Johns A, Mitchell M, et al. A qualitative examination of the impact of the COVID-19 pandemic on children and adolescents with autism and their parents. *Res Dev Disabil.* 2022;125:104232. [PubMed: 35447501]
15. Schendel DE, Di Guiseppi C, Croen LA, et al. The study to explore early development (SEED): a multisite epidemiologic study of autism by the centers for autism and developmental disabilities research and epidemiology (CADDRE) network. *J Autism Dev Disord.* 2012;42:2121–2140. [PubMed: 22350336]
16. Wiggins LD, Reynolds A, Rice CE, et al. Using standardized diagnostic instruments to classify children with autism in the study to explore early development. *J Autism Dev Disord.* 2015;45:1271–1280. [PubMed: 25348175]
17. Sherby MR, Kalb LG, Collier RJ, et al. Supporting COVID-19 school safety for children with disabilities and medical complexity. *Pediatrics.* 2022;14912 suppl 2:e2021054268H.
18. Gemmell M, Sherby MR, Walsh TJ, et al. Recommendations for SARS-CoV-2 testing in children with disabilities and medical complexity. *Pediatrics.* 2023;152 suppl 1:e2022060352G.
19. Schott W, Tao S, Shea L. Prevalence of high-risk conditions for severe COVID-19 among Medicaid-enrolled children with autism and mental health diagnoses in the United States. *Autism.* 2023;27:2145–2157. [PubMed: 36799305]
20. Aishworiya R, Kang YQ. Including children with developmental disabilities in the equation during this COVID-19 pandemic. *J Autism Dev Disord.* 2021;51:2155–2158. [PubMed: 32816170]
21. Gleason J, Ross W, Fossi A, et al. The devastating impact of COVID-19 on individuals with intellectual disabilities in the United States. *NEJM Catal Innov Care Deliv.* 2021;2.
22. Frank-Crawford MA, Hallgren MM, McKenzie A, et al. Mask compliance training for individuals with intellectual and developmental disabilities. *Behav Anal Pract.* 2021;14:883–892. [PubMed: 34150186]
23. Cowell R, Vostanis A, Langdon PE. Increasing face mask wearing in autistic individuals using behavior analytic interventions: a systematic review and meta-analysis. *J Autism Dev Disord.* 2024;54:4061–4080. Published online. [PubMed: 37751092]
24. Sivaraman M, Virues-Ortega J, Roeyers H. Telehealth mask wearing training for children with autism during the COVID-19 pandemic. *J Appl Behav Anal.* 2021;54:70–86. [PubMed: 33241588]
25. Lillie MA, Harman MJ, Hurd M, et al. Increasing passive compliance to wearing a facemask in children with autism spectrum disorder. *J Appl Behav Anal.* 2021;54:582–599. [PubMed: 33740281]
26. Halbur M, Kodak T, McKee M, et al. Tolerance of face coverings for children with autism spectrum disorder. *J Appl Behav Anal.* 2021;54:600–617. [PubMed: 33772777]

**Figure 1.**

Proportional Euler diagrams illustrating pattern of COVID-19 mitigation measure difficulty for (A) ASD respondents, (B) other DD respondents, and (C) POP respondents. SEED COVID Impact Assessment, 2021 (n = 1027). ASD, autism spectrum disorder; DD, developmental disability; POP, population comparison; SEED, Study to Explore Early Development.

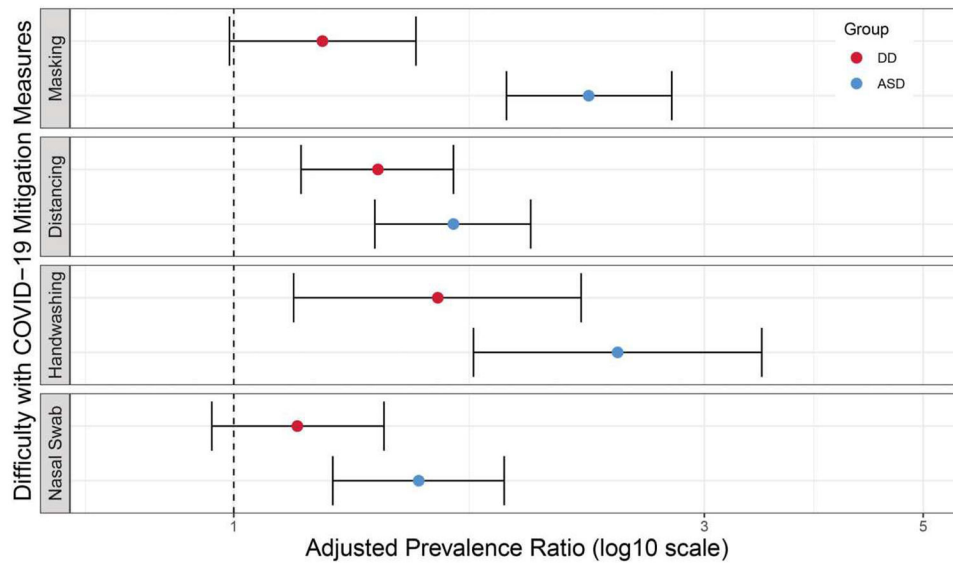


Figure 2.

Adjusted PRs and 95% CIs (log scale) of difficulty with COVID-19 mitigation measures and nasal swabs associated with viral testing for ASD versus POP and other DD versus POP, SEED COVID-19 Impact Assessment. PRs adjusted for race and sex of the study child, household income relative to the federal poverty threshold, and study site. ASD, autism spectrum disorder; DD, developmental disability; POP, population comparison; PRs, prevalence ratios; SEED, Study to Explore Early Development.

Table 1.
Demographic Characteristics of the Study to Explore Early Development (SEED) COVID-19 Impact Assessment Respondents, 2021 (n = 1027)

Variable	ASD (n = 274) n (%)	Other DD (n = 368)	POP (n = 385)	p ^a
Study child's race/ethnicity				
Non-Hispanic White	158 (57.7)	243 (66.0)	278 (72.2)	0.008
Non-Hispanic Black	41 (15.0)	43 (11.7)	24 (6.2)	
Hispanic	35 (12.8)	42 (11.4)	39 (10.1)	
Multiracial	31 (11.3)	30 (8.2)	34 (8.8)	
Non-Hispanic other	__ ^b	__ ^b	__ ^b	
Study child's sex				
Female	57 (20.8)	136 (37.0)	185 (48.1)	<0.001
Male	217 (79.2)	232 (63.0)	200 (51.9)	
Household income as percent of federal poverty level				
≥400%	86 (31.4)	172 (46.7)	206 (53.5)	<0.001
301%–399%	47 (17.2)	63 (17.1)	64 (16.6)	
201%–300%	44 (16.1)	45 (12.2)	59 (15.3)	
101%–200%	58 (21.2)	51 (13.9)	43 (11.2)	
<100%	33 (12.0)	25 (6.8)	__ ^b	
Unknown	__ ^b	12 (3.3)	__ ^b	
Study site				
Colorado	39 (14.2)	52 (14.1)	79 (20.5)	0.007
Georgia	31 (11.3)	59 (16.0)	35 (9.1)	
Maryland	39 (14.2)	35 (9.5)	40 (10.4)	
Missouri	59 (21.5)	61 (16.6)	82 (21.3)	
North Carolina	43 (15.7)	78 (21.2)	59 (15.3)	
Wisconsin	63 (23.0)	83 (22.6)	90 (23.4)	

^a Pearson's χ^2 test.

^b Suppressed because of cell sizes <10.

ASD, autism spectrum disorder; DD, developmental disability; POP, population comparison; SEED, Study to Explore Early Development.

Table 2.

Caregiver-Reported COVID-19 Infection and Mitigation Measure Difficulty Questions, Study to Explore Early Development (SEED) COVID Impact Assessment, 2021 (n = 1027)

Variable	ASD (n = 274) n (%)	Other DD (n = 368)	POP (n = 385)	p
Child received a COVID-19 test	99 (36.1)	145 (39.4)	139 (36.1)	0.58
COVID-19 test was positive	11 (11.2)	19 (13.1)	— ^c (<5%)	0.03
Child had difficulty with				
Masking	177 (64.6)	123 (33.4)	104 (27.0)	<0.001
Physical distancing	160 (58.4)	172 (46.7)	129 (33.5)	<0.001
Handwashing	91 (32.2)	73 (19.8)	48 (12.5)	<0.001
Nasal swab ^a	75/92 (81.52)	90/140 (64.3)	82/133 (61.6)	0.004
Total mitigation difficulties ^b				<0.001
0	58 (21.2)	155 (42.1)	204 (53.0)	
1	65 (23.7)	99 (26.9)	100 (26.0)	
2	90 (32.8)	73 (19.8)	62 (16.1)	
3	61 (22.3)	41 (11.1)	19 (4.9)	

^aSample restricted to children who received a COVID test and answered yes or no to difficulties with nasal swabbing.

^bTotal number of mitigation measure difficulties that were endorsed by respondents. Possible values ranged from 0 to 3 (nasal swab variable not included).

^cSuppressed because of cell size <10.

ASD, autism spectrum disorder; DD, developmental disability; POP, population comparison; SEED, Study to Explore Early Development.