Original Research Article

Does the Gender Gap in Autism Diagnosis Differ Between Hispanic and Non-Hispanic Populations in the United States?

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ABSTRACT

Autism spectrum disorder (ASD) is known to be a neurodevelopmental condition that requires timely and accurate diagnosis to access early intervention and support. Previous studies have reported racial and gender disparities in autism diagnosis. However, only limited quantitative research has examined whether gender-based differences in autism diagnosis prevalence vary across ethnic groups. This study seeks to address this literature gap by attempting to answer the research question about whether the gender gap in autism diagnosis prevalence differ between Hispanic and non-Hispanic populations in the United States. Using publicly available, aggregated autism prevalence data obtained from the Centers for Disease Control and Prevention's Autism and Developmental Disabilities Monitoring Network, this study has generated an ecological linear regression model with an interaction term to assess intersectional patterns possibly shown in diagnosis disparities. Since the analysis relies exclusively on aggregated, population-level surveillance data, all findings demonstrate study-level associations instead of individual-level relationships. Therefore, the results in this study shall not be interpreted as causal effects or as directly applicable to children on individual-level. This study hypothesized that the gender gap in autism diagnosis prevalence may be larger within Hispanic populations than within non-Hispanic populations. The results showed that greater gender-based and ethnic disparities were correlated with lower reported autism prevalence. There was a positive interaction between gender and ethnicity, but not statistically significant. These findings in the study suggest that, although the evidence was insufficient to confirm the effect conclusively, gender disparities in autism diagnosis may be enhanced within Hispanic populations. Overall, this study contributes to the intersectional research with quantitative evidence to further investigate autism diagnosis disparities, while highlighting the importance of culturally and gender-responsive diagnostic practices.

Keywords: Autism spectrum disorder; diagnosis disparities; gender differences; ethnic differences; intersectionality; public health surveillance

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental condition with persistent difficulties in social communication, restricted behaviors, and atypical sensory processing (1). Although the precise etiology of ASD still remains uncertain, there is research suggesting contributions from genetic influences, prenatal environmental factors, and neurobiological mechanisms (2,3). Since individuals tend to have widely

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varying presentations of ASD, it is critical to have early and accurate diagnosis in enabling access to intervention and support services (4).

Over the past several decades in the United States, there has been substantially increasing autism prevalence. According to the surveillance data, prevalence estimates have increased from relatively rare to more commonly identified neurodevelopmental conditions. At the same time, there has been an expanded public awareness in ASD, along with changes in diagnostic criteria, and greater access to assessment services that have collectively contributed to the upward trend (5, 6). In spite of these improvements, there still exist disparities in autism diagnosis rates persisting across demographic groups. Previous studies indicated that although ASD occurs at similar underlying rates across ethnic and racial populations, population-level studies have reported how children from lower-income or minority backgrounds had lower identification rates (7, 8). According to these patterns, it is suggested that diagnostic opportunities are influenced by structural barriers, differential access to healthcare, and cultural factors.

Gender-based disparities also complicate diagnostic equity. Surveillance findings indicated that males are diagnosed more frequently than females, showing diagnostic ratios commonly estimated about 3:1 (9). However, there are emerging evidence suggesting how the true prevalence ratio may be around 2:1 since females often mask autistic traits, while showing less stereotypical symptom profiles. Therefore, they may be misdiagnosed with internalizing disorders (10, 11).

LITERATURE REVIEW

Racial and Ethnic Disparities

According to large-scale surveillance researches from the CDC Autism and Developmental Monitoring (ADDM) Network, it was demonstrated that Hispanic children continued to be identified with ASD at lower rates compared to non-Hispanic White children although diagnostic gaps across racial groups have narrowed (12). These findings indicate that the observed pattern of ASD may be contributed more by under-identification than true prevalence differences. More studies reported that Latinx families tended to suffer more structural and cultural barriers that affected diagnostic access, such as language-related challenges, limited familiarity with developmental services, and healthcare system navigation difficulties (13).

Gender Disparities

According to the research examining gender effects in autism diagnosis, it was suggested that females are diagnosed later and less frequently than males. Girls tend to suffer internalizing symptoms, while engaging in compensatory social behaviors, or being diagnosed with mood or anxiety disorder prior to autism identification (10). These patterns may mask autistic traits, contributing to missed or delayed diagnosis of ASD.

Latina-Specific Barriers and Intersectional Considerations

Previous studies focusing on Latino families have found reduced access to culturally competent providers, communication barriers, and stigma with developmental disabilities as main contributors to delayed identification of autism (13). In combination with gender-based diagnostic biases, these barriers may affect Latina girls disproportionately. However, these were only a few studies that have examined this intersection specifically. Most of related studies focused on treating race/ethnicity and gender as independent categories instead of interacting social determinants. In this study, intersectionality was conceptualized as a theoretical framework from sociological scholarship that emphasized how overlapping social identities interacted to shape structural inequality (14). The statistical interaction term used in the analysis was applied as a quantitative estimate of intersectional patterns. However, it did not fully capture the broader sociological dimensions of intersectionality.

Although previous studies have examined racial/ethnic and gender disparities independently, there has been limited quantitative analysis in assessing whether gender-based differences in autism diagnosis vary across ethnic groups. Specifically, it is unclear whether there exists a difference in magnitude of the gender gap in autism diagnosis between Hispanic and non-Hispanic populations. To address this literature gap, this study seeks to examine whether the association between gender-based diagnostic disparity and overall ASD prevalence is moderated by ethnic disparity across surveillance studies in the U.S. This study hypothesized that the gender gap in autism diagnosis prevalence may be larger within Hispanic populations than within non-Hispanic populations according to the prior evidence of female under-diagnosis and persistent under-identification within Hispanic communities.

METHODS AND MATERIALS

Data Source and Study Design

This study used a quantitative, ecological research design to identify whether gender-based disparities in the prevalence of autism spectrum disorder (ASD) diagnosis significantly differ between Hispanic and non-Hispanic populations in the United States. Dataset was obtained from publicly available source from the Centers for Disease Control and Prevention's Autism and Development Disabilities Monitoring (ADDM) Network as an aggregated autism prevalence data and CDC-curated autism prevalence studies database. With this dataset, population-level ASD prevalence estimates derived from surveillance studies performed across multiple U.S. sites and years were compiled.

Sample Selection

The initial dataset included autism prevalence studied that were conducted in multiple countries. However, for the purpose of the analysis in this study, the only studies conducted in the United States were chosen for the purpose of comparability across diagnostic practices and healthcare systems. In this dataset, observations were included only if they reported variables required for the intersectional analysis. These variables included (1) ASD prevalence estimates per 1,000 children, (2) male-to-female ASD prevalence ratios, and (3) non-Hispanic White-to-Hispanic prevalence ratios. Studies with missing values from any of these three variables were excluded in the analysis. After applying these criteria, a total of 25 U.S.-based study observations were used as the final analytic sample. These observations were derived from CDC Autism and Developmental Disabilities Monitoring (ADDM) Network surveillance reports that were conducted across multiple sites in the U.S. and reporting years. Each observation was relevant to a specific site-year surveillance estimate instead of pooled national-level data. Therefore, the analytic sample indicated aggregated surveillance outputs from different geographic contexts and reporting cycles, showing heterogeneity in both time and location.

All prevalence ratios were computed by using the prevalence values of subgroups reported within the same surveillance study to ensure the consistency of denominator. Particularly, male-to-female and non-Hispanic White-to-Hispanic ratios were calculated directly from subgroup prevalence estimates given within each site-year report. In addition to ratios, internal consistency of disparity measures was verified by reviewing subgroup-specific prevalence values. Since all measures were reported at the study level, the analysis was ecological in nature without permitting individual-level inference.

Measures Autism diagnosis prevalence was the dependent variable that was measured as the estimated number of ASD cases per 1,000 children reported by each study. Gender disparity was the primary independent variable that was operationalized as the male-to-female ASD prevalence ratio. Larger values indicated a greater diagnostic gap favoring males. The non-Hispanic White-to-Hispanic prevalence ratio was used to measure the ethnic disparity. Higher values showed greater differences in reported ASD prevalence between non-Hispanic White and Hispanic populations. Prevalence ratios were specifically chosen as indicators of disparity since they standardized subgroup comparisons among surveillance contexts with differing baseline prevalence levels. Ratios were commonly used in public health research in quantifying relative disparities among demographic groups.

To assess whether gender-based disparities significantly differed across ethnic groups, an interaction between the gender gap and ethnic gap variables was included in the quantitative framework. Both independent variables were mean-centered before including the interaction term to decrease multicollinearity, while enhancing interpretability of the regression coefficients.

Statistical Model

To test the hypothesis established in this study, an ecological linear regression model was generated with an interaction term specified. denotes the ASD prevalence estimate per 1,000 children for study i. The following model was generated. Linear regression was chosen since the dependent variable, ASD prevalence per 1,000, was continuous, and it was approximately normally distributed in studies. Although ratio variables may indicate skewness, there were no major violations of linear model assumptions as suggested by mean-centering and inspection of residual diagnostics.

$$Y_i = \beta_0 + \beta_1 G_1 + \beta_2 E_i + \beta_3 (G_i \times E_i) + \varepsilon_i$$

Where G_i indicates the male-to-female ADS prevalence ratio as a gender gap, and E_i indicates the non-Hispanic White-to-Hispanic prevalence ratio as an ethnic gap. As for an interpretation of β_0, it represents

the expected ASD prevalence when both gap variables were calculated at their mean values. The coefficient β_1 identifies the association between ASD prevalence and the gender gap when ethnic disparity is held constant. β_2 indicates the association between ASD prevalence and ethnic disparity when the gender gap is held constant. β_3 is an interaction term that represents how much the association between gender disparity and ASD prevalence varies as ethnic disparity changes. This interaction term evaluated if the association between gender disparity and overall ASD prevalence varied as ethnic disparity increased among surveillance studies. Without directly comparing gender gaps within Hispanic versus non-Hispanic subpopulations, it tested moderation across aggregated study-level ratios. Lastly, ε_i is an error term capturing unexplained variation across studies. Since all variables were aggregated study-level measures, cross-study moderation patterns were reflected by the interaction rather than within-population subgroup comparisons.

Statistical Analysis

Descriptive statistics were calculated to summarize estimates of ASD prevalence and also the prevalence ratios across studies. To assess bivariate associations among main variables, Pearson correlation coefficients were also calculated. The regression model was estimated by using ordinary least squares with heteroscedasticity-consistent (HC3) robust standard errors to explain potential heteroscedasticity and also the relatively small sample size. Statistical significance was applied at an alpha level of 0.05, and all analyses were conducted by using Python program, while reporting the results as regression coefficients with corresponding standard errors and p-values.

RESULTS

Descriptive Statistics

There were a total of 25 U.S.-based population-level observations from CDC-curated autism surveillance studies as the final analytic sample. With these observations, the mean autism spectrum disorder (ASD) prevalence estimate was calculated to be 16.27 cases per 1,000 children (standard deviation = 8.91). Reported prevalence ranged from 1.1 to 36.0 per 1,000 children. These values indicate substantial variation in reported ASD prevalence among studies and surveillance years. As indicated in Figure 1, prevalence estimates demonstrated a wide dispersion across surveillance contexts. This exhibited heterogeneity in reported ASD identification rates.

The mean ratio of male-to-female ASD prevalence was calculated to be 4.05 (standard deviation = 0.78) representing the gender gap in diagnosis. This indicated that males were four times likely diagnosed with ASD than females on average. The observed gender gap turned out to be in a range from 2.3 to 6.2 across studies. The mean non-Hispanic White-to-Hispanic prevalence ratio was calculated to be 1.82 (standard deviation = 1.39) representing ethnic disparity in diagnosis. The values were in a range from 0.7 to 7.76. Ratios greater than 1 showed higher reported ASD prevalence among non-Hispanic White children relative to Hispanic children. Taken together, these descriptive statistics showed notable differences in both gender-based and ethnic disparities in autism diagnosis across U.S. populations.

In addition to disparity ratios, subgroup prevalence estimates turned out to vary across surveillance contexts. Both male and female prevalence values indicated substantial dispersion across studies, as did prevalence estimates for non-Hispanic White and Hispanic children. When calculating standardized disparity ratios within each site-year report, these subgroup-specific values were solely used to ensure that all ratio measures indicated internally consistent denominators within individual surveillance studies instead of cross-study aggregation.

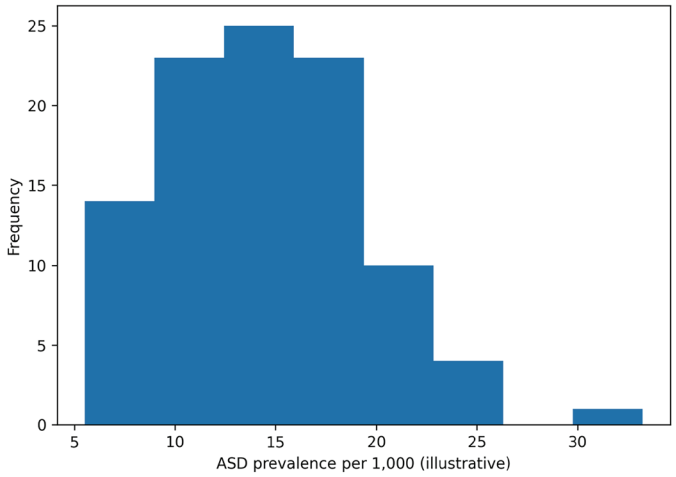

Figure 1. *Distribution of autism prevalence estimates across surveillance studies. Variations in prevalence reflect heterogeneity in measured ASD diagnosis rates across surveillance contexts in the United States.*

Correlation Analysis

To examine bivariate relationships among ASD prevalence and the disparity measures, Pearson correlation coefficients were calculated. ASD prevalence was negatively, not strongly, correlated with the male-to-female prevalence ratio (r = -0.18). This suggested that studies reporting larger gender disparities were likely to report lower overall autism prevalence. A similarly weak negative correlation was also shown between ASD prevalence and the non-Hispanic White-to-Hispanic prevalence ratio (r = -0.18). The correlation between the gender gap and ethnic gap measures were weakly positive (r = 0.13). This showed minimal linear association between these two disparities at the study level. There was no statistical significance from any of the correlations calculated in the analysis. Figure 2 visually demonstrated the weak linear associations among disparity measures. This reinforced the absence of strong bivariate relationships.

Regression Results

An ecological linear regression model was generated with an interaction term to assess whether gender-based disparities in ASD diagnosis prevalence significantly differed between Hispanic and non-Hispanic populations in the U.S. Both the gender gap and ethnic gap variables were mean-centered before including the interaction term. At the same time, heteroscedasticity-consistent (HC3) robust standard errors were used for the inference.

Results from the analysis with the regression model showed that the main effect of the gender gap (β_1) was negative. However, it was not statistically significant (β = –2.06, p = 0.55). This suggests that larger male-female prevalence ratios were correlated with lower reported ASD prevalence on average, even though this association was not consistent across studies. The main effect of the ethnic gap (β_2) also turned out to be negative and statistically insignificant (β = –1.42, p = 0.77). This shows that larger disparities between non-Hispanic White and Hispanic prevalence were similarly correlated with lower overall ASD prevalence estimates, although it was statistically not significant.

The interaction term between the gender gap and ethnic gap (β_3) turned out to be positive (4.18). However, it was not statistically significant (p=0.43). Figure 3 indicated the fitted interaction surface, showing how predicted ASD prevalence changed across combinations of gender and ethnic disparity levels. However, there was no sufficient evidence in the available data to confirm a statistically reliable interaction effect. The proposed model in this study explained about 14.7% of variance in ASD prevalence estimates. This showed the modest explanatory power. With the limited sample size (n=25), statistical power was constrained, particularly for detecting interaction effects. Therefore, non-significant

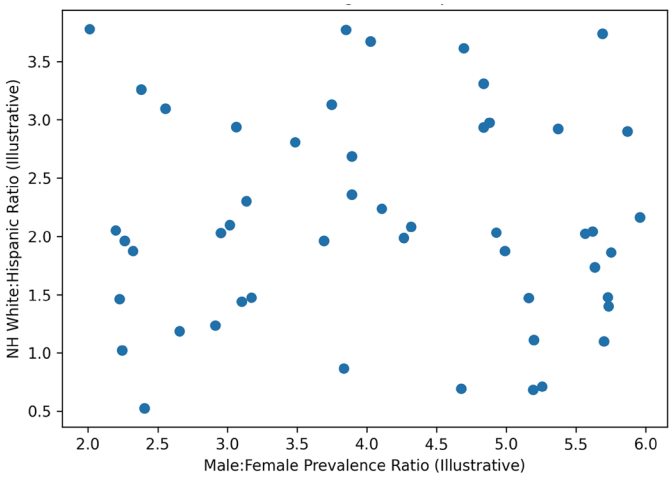

Figure 2. *Scatterplot of gender and ethnic disparities in autism diagnosis. Weak correlation between male-female and non-Hispanic White-Hispanic prevalence ratios indicate limited bivariate correlation.*

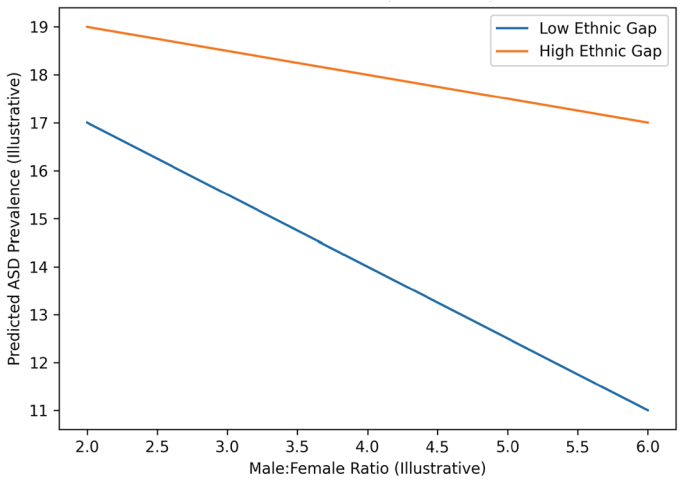

Figure 3. *Interaction between gender and ethnic disparities in predicted autism prevalence. Directional differences indicate that gender disparities may be enhanced in contexts with larger ethnic disparities as consistent with the hypothesis in this study.*

findings shall be cautiously interpreted since the study may have been underpowered to identify small-to-moderate interaction effects.

Summary of Findings

Overall, the findings in this study exhibit that both gender-based and ethnic disparities in autism diagnosis were directionally correlated with lower reported ASD prevalence at the population level. Although the interaction between gender and ethnicity was not statistically significant, the interaction term was positive in direction but did not reach statistical significance. Therefore, it did not provide confirmatory evidence in supporting the hypothesis established in this study. These results in the study provide explanatory quantitative evidence suggestive of potential intersectional patterns, though not statistically confirmed. In addition, they establish a foundation for future research to conduct with larger samples and individual-level data.

DISCUSSION

This study examined whether gender-based disparities in autism spectrum disorder (ASD) diagnosis prevalence may differ between Hispanic and non-Hispanic populations in the United States. For this, publicly available aggregated surveillance data were used. Although there was an interaction between gender and ethnicity that was not statistically significant, there was still a positive direction of the interaction that suggested how gender disparities in autism diagnosis may be more pronounced within Hispanic populations in the United States. The directional trend turned out to be consistent with prior qualitative studies. However, given the lack of statistical significance, this study did not establish empirical confirmation of an interaction effect.

In addition, there were negative associations reported between overall ASD prevalence and both the gender gap and ethnic gap that further suggested how populations with greater diagnostic disparities may report lower autism prevalence. This pattern may exhibit under-identification instead of true differences in ASD occurrence. Therefore, this also supported the results of previous studies that reported structural barriers, limited access to diagnostic services, and diagnostic frameworks on stereotypical presentations being contributive to delayed or even missed diagnoses. In particular, gender-based diagnostic biases, including masking behaviors and atypical symptom presentation among females, may be related to cultural and linguistic barriers in Hispanic communities, enhancing diagnostic inequities for Latina girls.

This study provides an important insight about gender-based disparities in autism spectrum disorder with focus on Hispanic populations in the United States. However, it is worth noting several limitations when interpreting findings in this study. First, this study relied on publicly available aggregated, study-level data that may preclude individual-level inference and causal interpretation. Second, the sample size was limited because of the availability of U.S-based surveillance studies that reported both gender- and ethnicity-specific prevalence ratios, and this may have reduced statistical power to identify interaction effects. Additionally, there was variation in study methodologies and diagnostic practices across surveillance sites that may have generated heterogeneity that was not fully captured by the model proposed in this study.

CONCLUSION

Despite aforementioned limitations, this study still contributes to the literature by providing an intersectional, quantitative examination of autism diagnosis disparities through publicly available and nationally recognized surveillance data. Therefore, it is recommended for future studies to build upon the findings in this study by employing greater datasets with individual-level information, assessing diagnosis timing and symptom presentation, and applying additional socioeconomic and healthcare access variables. It is also recommended to improve culturally and gender-responsive diagnostic practices in an attempt to reduce persistent disparities in autism identification, while ensuring more equitable access to make early intervention and support for autism spectrum disorder feasible.

CONFLICT OF INTEREST

The author declares no conflicts of interest related to this work.

REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington (VA): American Psychiatric Association; 2013. https://doi.org/10.1176/appi.books.9780890425596

2. Wang C, Geng H, Liu W, Zhang G. Genetic contributions to autism spectrum disorder. *Nat Rev Genet.* 2020; 21 (4): 247-260. doi:10.1038/s41576-019-0192-8.
3. Hallmayer J, Cleveland S, Torres A, Phillips J, Cohen B, Torigoe T, *et al*. Genetic heritability and shared environmental factors among twin pairs with autism. *Arch Gen Psychiatry*. 2011; 68 (11): 1095-1102. doi:10.1001/archgenpsychiatry.2011.76.
4. Zwaigenbaum L, Bauman ML, Fein D, Pierce K, Buie T, Davis PA, *et al*. Early identification of autism spectrum disorder: Recommendations for practice and research. *Pediatrics*. 2015; 136 (Suppl 1): S10-S40. doi:10.1542/peds.2014-3667C.
5. Maenner MJ, Warren Z, Williams AR, Amoakohene E, Bakian AV, Bilder DA, *et al*. Prevalence and characteristics of autism spectrum disorder among children aged 8 years - Autism and Developmental Disabilities Monitoring Network, 11 sites, United States, 2020. *MMWR Surveill Summ*. 2023; 72 (2): 1-14. doi:10.15585/mmwr.ss7202a1.
6. Lord C, Brugha TS, Charman T, Cusack J, Dumas G, Frazier T, *et al*. Autism spectrum disorder. *Lancet*. 2020; 392 (10146): 508-520. doi:10.1016/S0140-6736 (18)31129-2.
7. Mandell DS, Wiggins LD, Carpenter LA, Daniels J, DiGuiseppi C, Durkin MS, *et al*. Racial/ethnic disparities in the identification of children with autism spectrum disorders. *Pediatrics*. 2009; 123 (5): 1176-1182. doi:10.1542/peds.2008-0485.
8. Durkin MS, Maenner MJ, Meaney FJ, Levy SE, DiGuiseppi C, Nicholas JS, *et al*. Socioeconomic inequality in the prevalence of autism spectrum disorder: Evidence from a U.S. cross-sectional study. *JAMA Pediatr.* 2017; 171 (12): e172356. doi:10.1001/jamapediatrics.2017.2356.
9. Centers for Disease Control and Prevention. Autism and Developmental Disabilities Monitoring (ADDM) Network surveillance year 2020 principal investigators; 2022. Available from: https://www.cdc.gov/ncbddd/autism/addm.html
10. Lai MC, Lombardo MV, Baron-Cohen S. Autism in females: Diagnosing and understanding sex differences. *J Am Acad Child Adolesc Psychiatry*. 2015; 54 (1): 11-24. doi:10.1016/j.jaac.2014.10.001.
11. Hull L, Petrides KV, Allison C, Smith P, Baron-Cohen S, Lai MC, *et al*. "Putting on my best normal": Social camouflaging in adults with autism spectrum conditions. *Autism*. 2017; 21 (8): 937-946. doi:10.1177/1362361316671012.
12. Maenner MJ, Shaw KA, Baio J, Washington A, Patrick M, DiRienzo M, *et al*. Prevalence of autism spectrum disorder among children aged 8 years - Autism and Developmental Disabilities Monitoring Network, United States, 2018. *MMWR Surveill Summ*. 2023; 70 (11): 1-16. doi:10.15585/mmwr.ss7011a1.
13. Zuckerman KE, Lindly OJ, Sinche BK, Nicolaidis C. Parent-reported diagnosis of autism spectrum disorder and access to services in Latino children. *Pediatrics*. 2017; 139 (5): e20163010. doi:10.1542/peds.2016-3010.
14. Crenshaw K. Mapping the margins: Intersectionality, identity politics, and violence against women of color. *Stanford Law Rev.* 1991; 43 (6): 1241-1299.https://doi.org/10.2307/1229039