

# Adverse Childhood Experiences (ACEs) in Children with Autism Spectrum Disorder (ASD)

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## INTRODUCTION

- ACEs are traditionally defined to include three categories of childhood abuse which include psychological, physical, and sexual abuse and four categories of household dysfunction<sup>1</sup>
- ACEs affect both children with ASD and the mothers of these children
- Prior studies have shown that a greater number of maternal ACEs leads to a greater likelihood of ASD and ADHD in offspring<sup>2,3</sup>
- Prematurity, low birth weight, and pregnancy duration have all been identified to increase likelihood of ASD in children<sup>3</sup>
- The UC Davis MARBLER (Markers of Autism Risk in Babies Learning Early Signs) is a prospective longitudinal study which began in 2006 and enrolls women who already have a child with autism to investigate the recurrence in future children<sup>4</sup>

## OBJECTIVE

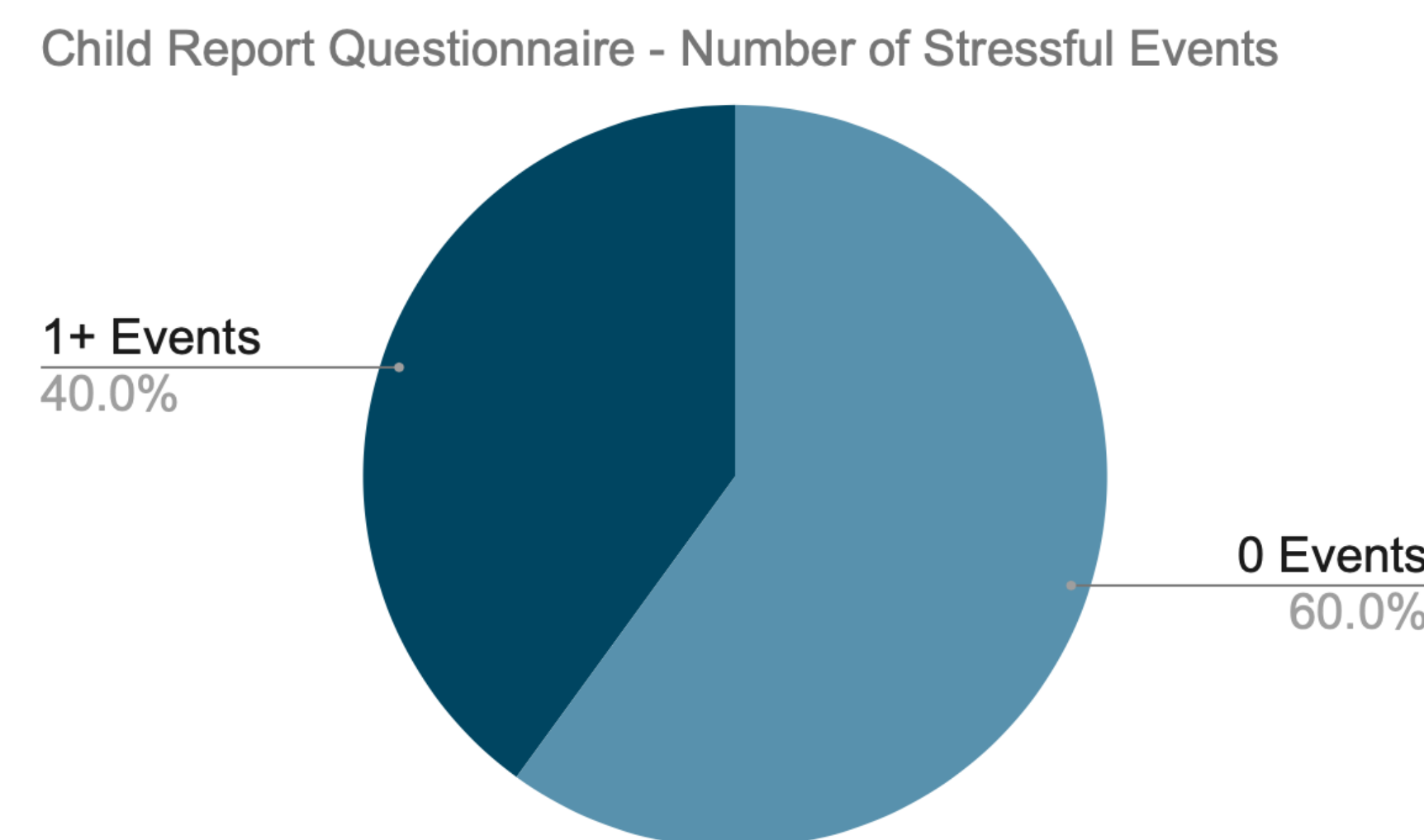
- Investigate whether there is an association between the number of maternal ACEs and the recurrence of autism in families with an autistic child.

## METHODS

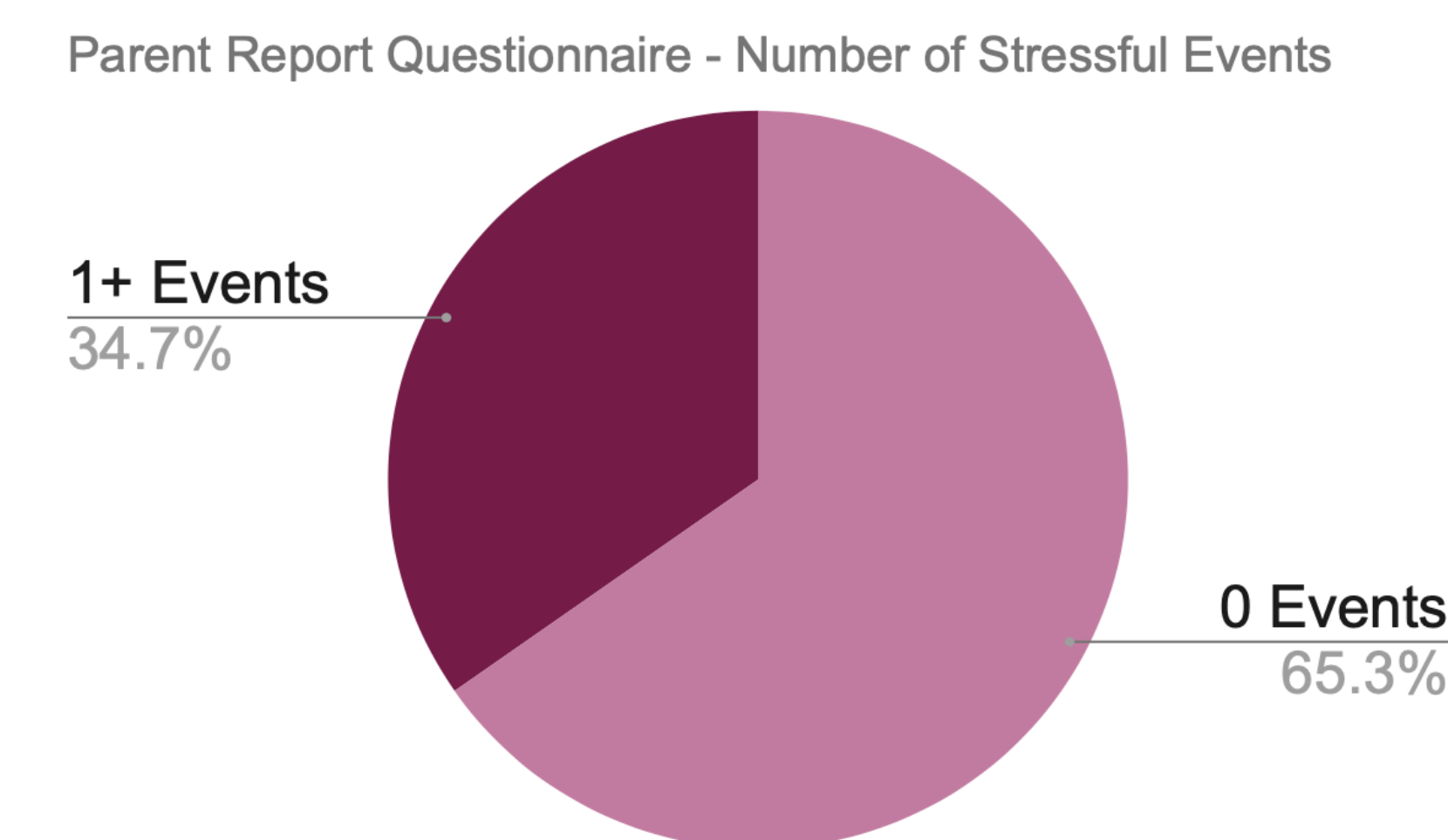
- Used Google Scholar to find research articles containing the words: Autism; Autism Spectrum Disorder (ASD); and Adverse Childhood Experiences; maternal ACEs
- Analyzed data containing information about maternal and child ACEs from the MARBLER study using parent and child responses
- Data used was collected through the ECHO study for the MARBLER cohort and includes responses from 3 surveys: Child Report, Parent Report, and Adult Primary Version

## RESULTS

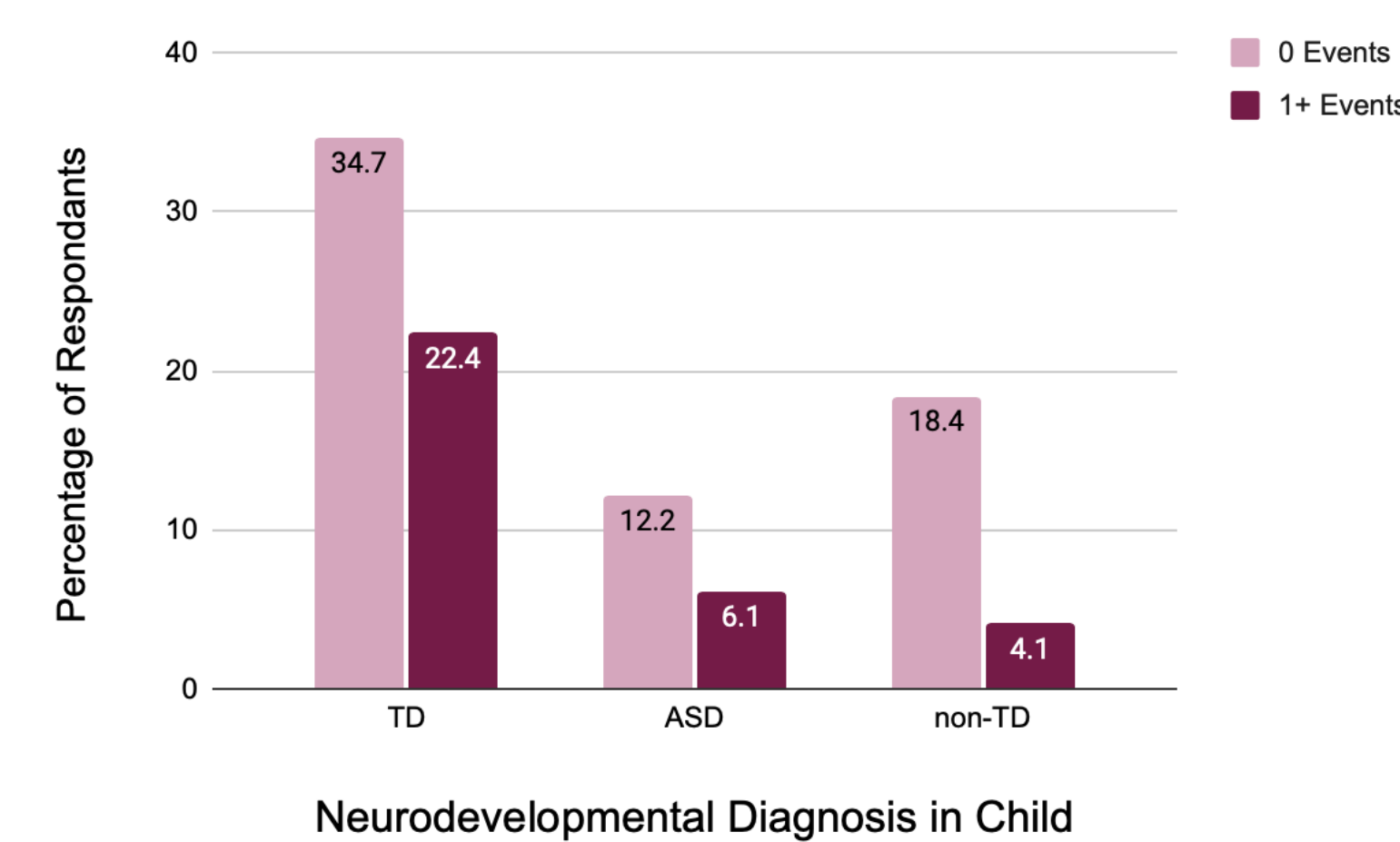
**Figure 1. Percentage of Respondents from Child Report Questionnaire and Number of Stressful Events experienced by child**



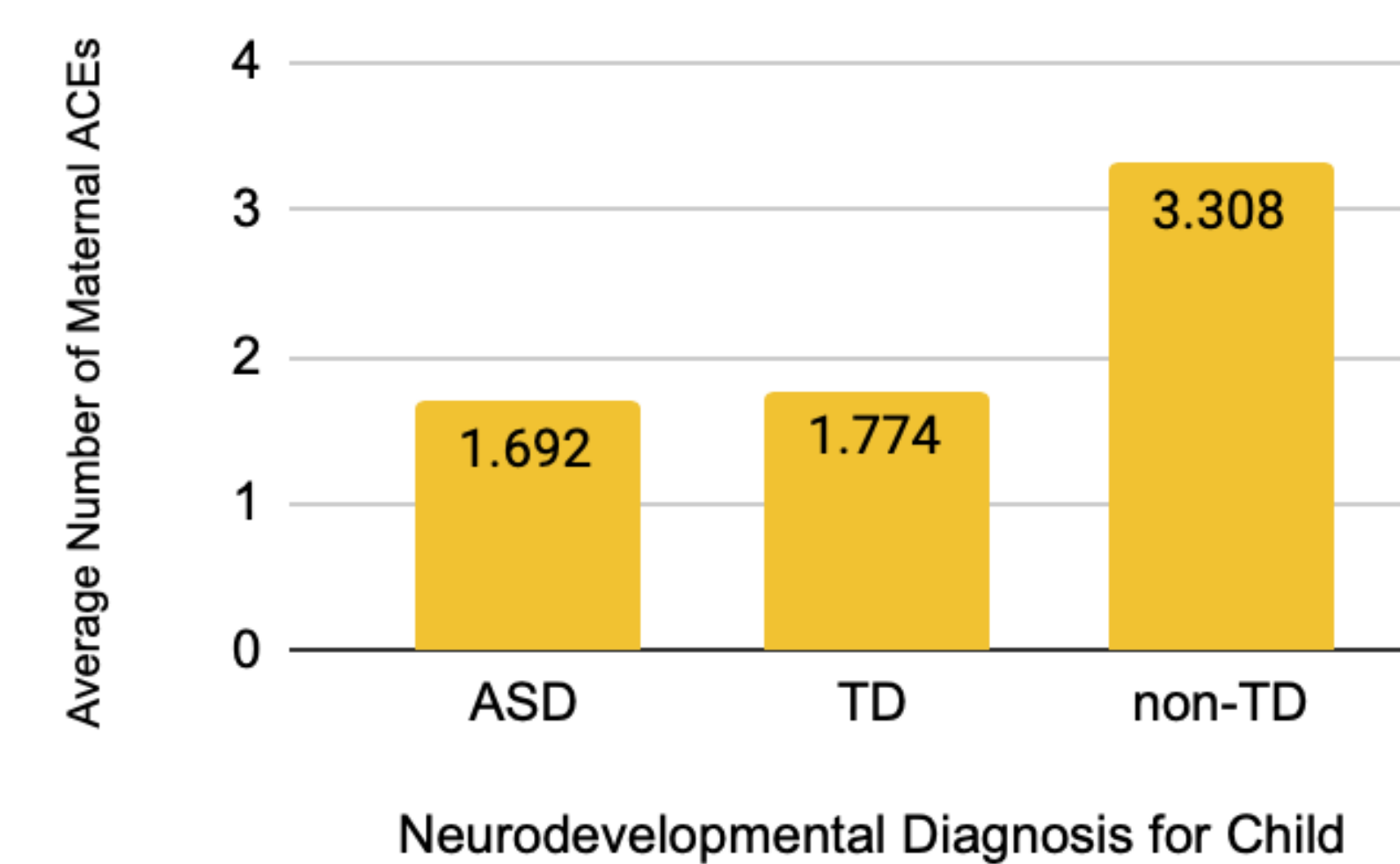
**Figure 2. Percentage of Respondent from Parent Report Questionnaire and Number of Stressful Events experienced by child**



**Figure 3. Percentage of Adult Respondents Who Reported their Child Experienced ACEs by Child Neurodevelopmental Outcome**



**Figure 4. Average Number of Maternal ACEs per category of neurodevelopmental diagnosis in child as reported in Adult Primary Version Questionnaire**



**Diagram: Description of the 3 categories of child neurodevelopmental diagnosis used in this study**

### ASD:

- Autism Spectrum Disorder
- Tested using Autism Diagnostic Observation Schedule (ADOS)

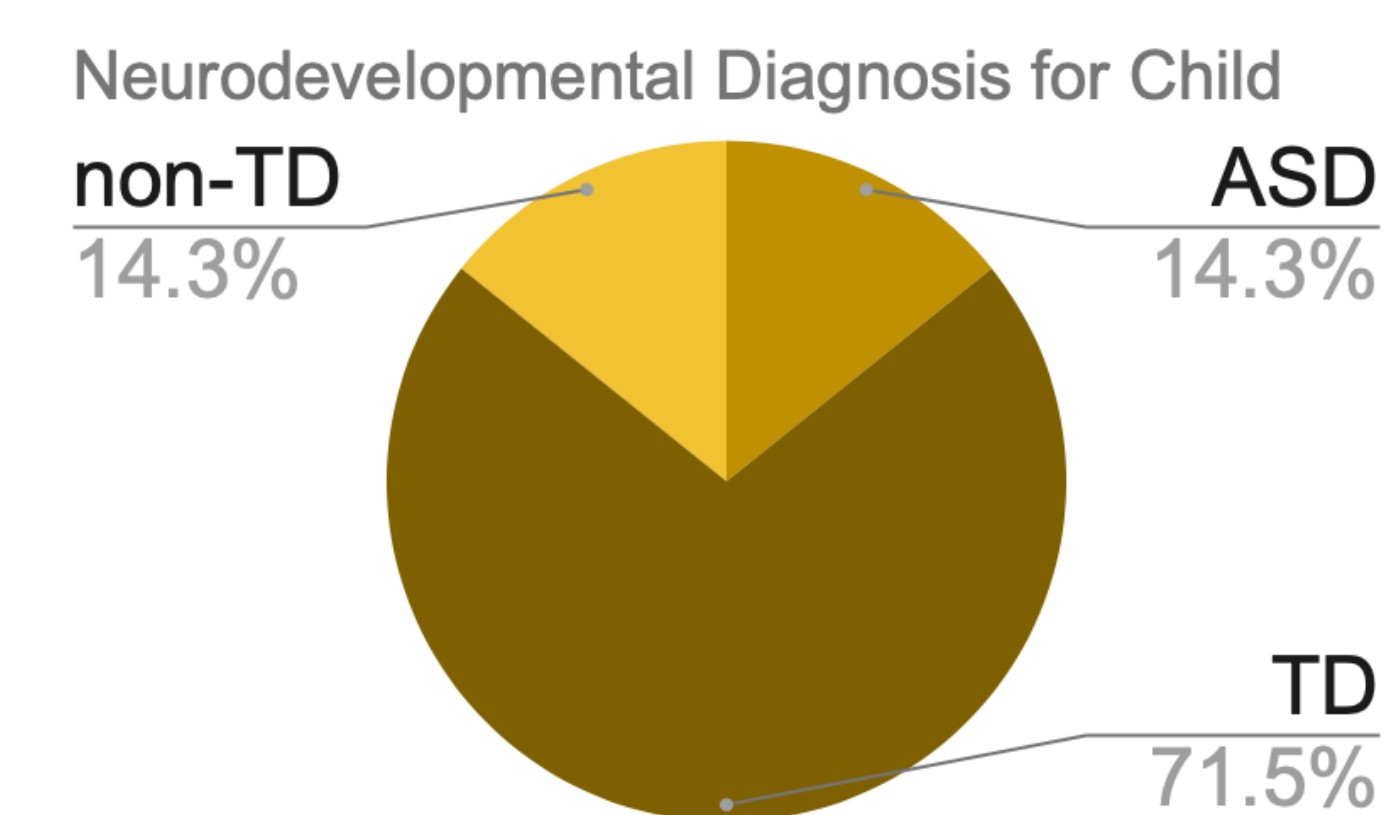
### TD:

- Typical Development
- Determined based on results of ADOS and MSEL tests

### Non-TD:

- Non-typical Development
- Tested for using Mullen Scale of Early Learning (MSEL) to assess cognitive function

**Figure 5. Percentage of Respondents from Adult Primary Version Questionnaire and Neurodevelopmental Outcome of Child**



## DISCUSSION

- Overall, children diagnosed with non-typical development (Non-TD) were associated with the greatest number of average maternal ACEs equaling 3.3.
- The number of ACEs reported for the child by the parent was less for ASD and non-TD compared with TD children
- The National Survey of Children's Health Data from 2017-18 reported that 30% of children experienced at least one ACE<sup>6</sup>
- Maternal ACEs have been shown to be associated with cognitive development concerns in children in another study using a Parental Evaluation of child development<sup>5</sup>

## CONCLUSIONS

- Maternal ACEs were associated with child development in high-risk families who already have an autistic child
- Current literature supports that ACEs could affect multiple domains such as child problem solving, communication, and personal-social skills
- The results of this study did not support the hypothesis that children born to mothers reporting a greater number of maternal ACEs would be diagnosed with ASD.<sup>7</sup>

## STRENGTHS & LIMITATIONS

- Provides insight to how maternal ACEs affect neurodevelopmental outcomes in offspring of high risk families
- Limited to data collected from the ECHO cohort in the MARBLER study and need bigger data set for future statistical analysis

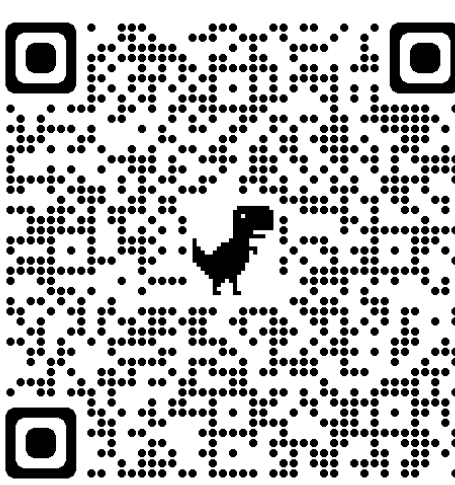
## FUTURE DIRECTIONS

- Complete this analysis with a larger population
- Look into epigenetic array data which may affect biological aging and mechanism resulting in cognitive delays in children

## ACKNOWLEDGEMENTS

Project would not have been made possible without the help of Dr. Rebecca Schmidt and the data collected in the MARBLER study. I would also like to acknowledge the MCHC Rise Up program for the opportunity!

MARBLER: R24ES028533  
ASD-ER ECHO: UH3OD023342



# INTRODUCTION

## WHAT ARE ADVERSE CHILDHOOD EXPERIENCES?

- ACEs are traditionally defined to include three categories of childhood abuse which include psychological, physical, and sexual abuse and four categories of household dysfunction<sup>1</sup>



# INTRODUCTION

## WHY DO ACES MATTER FOR NEURODEVELOPMENTAL DISORDERS?

- Prior studies have shown that a greater number of maternal ACEs leads to a greater likelihood of ASD and even ADHD in offspring<sup>2,3</sup>
- The UC Davis MARBLES (Markers of Autism Risk in Babies Learning Early Signs) is a prospective longitudinal study which began in 2006 and enrolls women who already have a child with autism to investigate the recurrence in future children<sup>4</sup>

# OBJECTIVES

1. Investigate whether there is an association between the amount of maternal ACEs and the recurrence of autism in families with an autistic child.

# METHODS

- Utilization of Google Scholar to find relevant research articles containing the words: Autism; Autism Spectrum Disorder (ASD); Adverse Childhood Experiences; maternal ACEs
- Analyzed data containing information about maternal and child ACEs from the MARBLES study using parent and child responses
- The data used is directly from the ECHO cohort in the MARBLES study and includes responses from 3 surveys: Child Report, Parent Report, and Adult Primary Version

# RESULTS

**Diagram: Description of the 3 categories of child neurodevelopmental diagnosis used in this study**

## ASD:

- Autism Spectrum Disorder
- Tested using Autism Diagnostic Observation Schedule (ADOS)

## TD:

- Typical Development
- Determined based on results of ADOS and MSEL tests

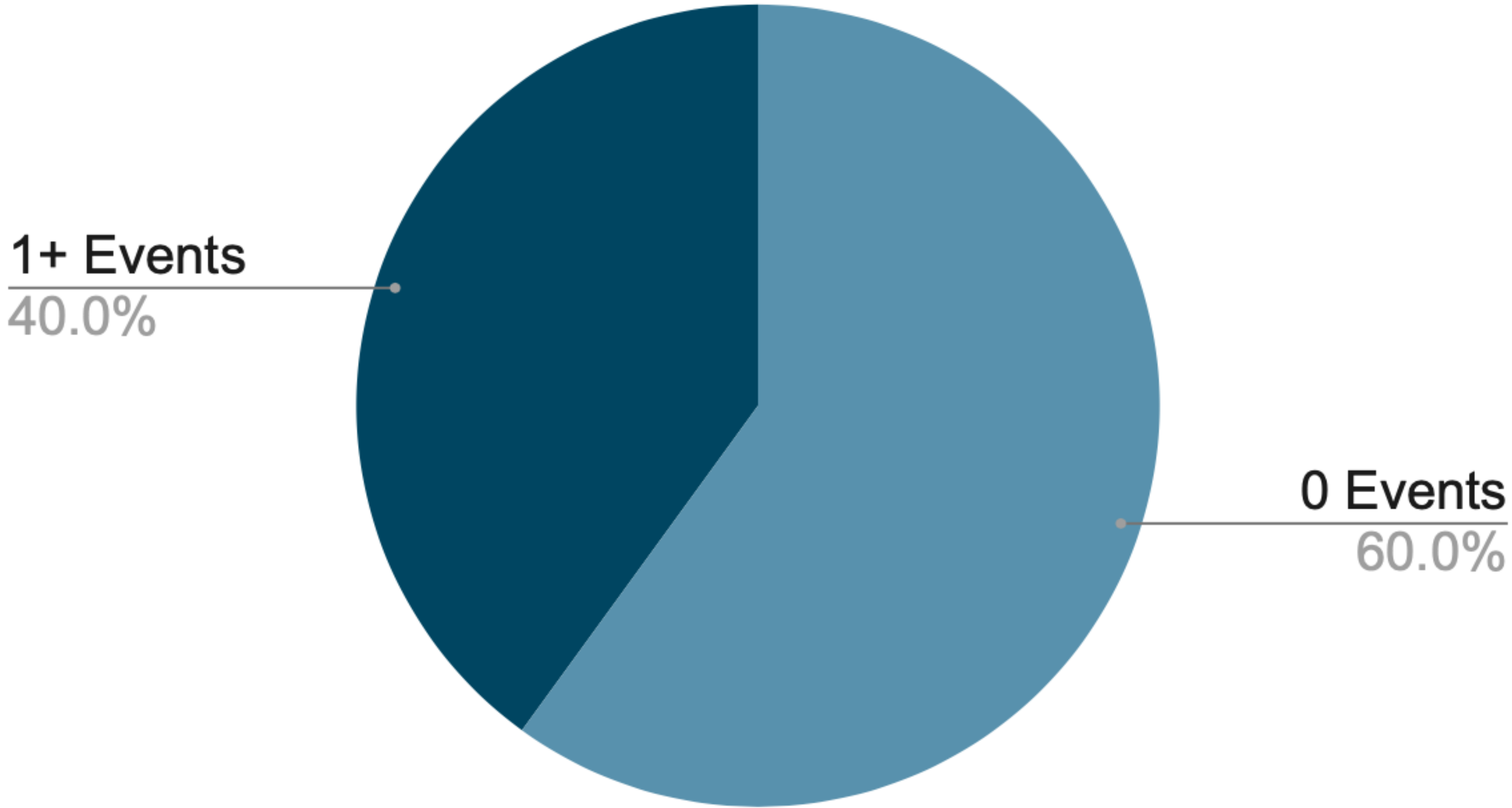
## non-TD:

- Non-typical Development
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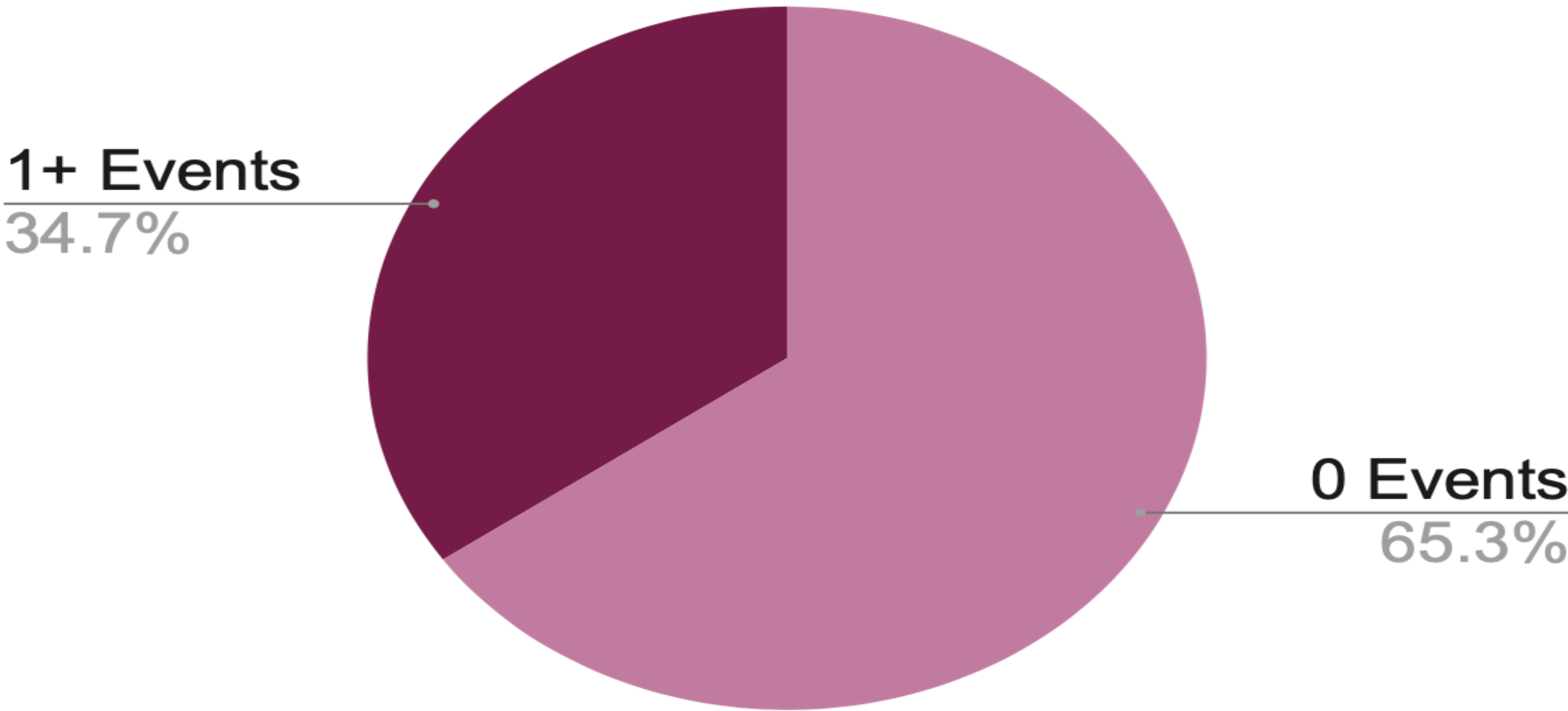
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Child Report Questionnaire - Number of Stressful Events

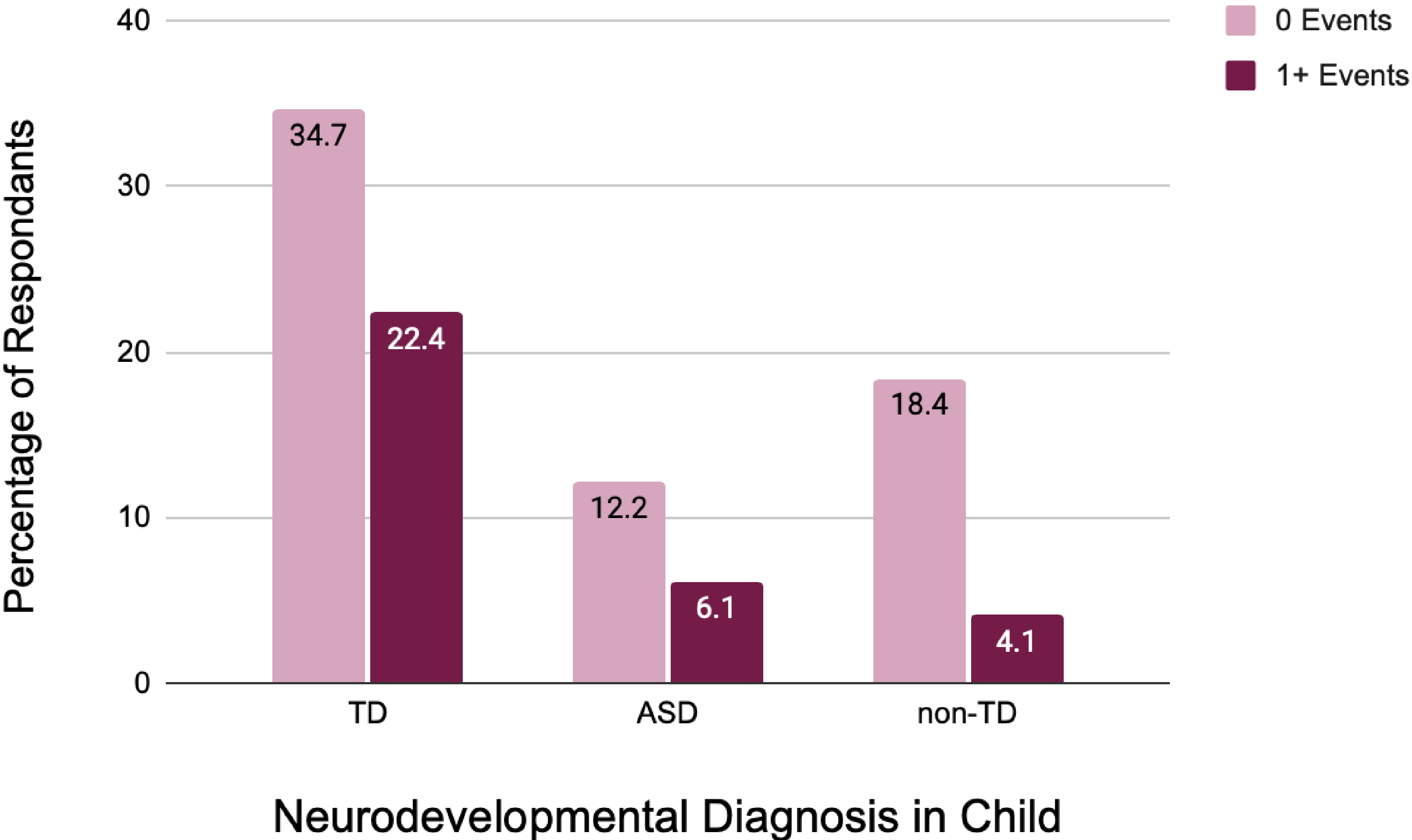


**Figure 2. Percentage of Respondent from Parent Report Questionnaire and Number of Stressful Events experienced by child**

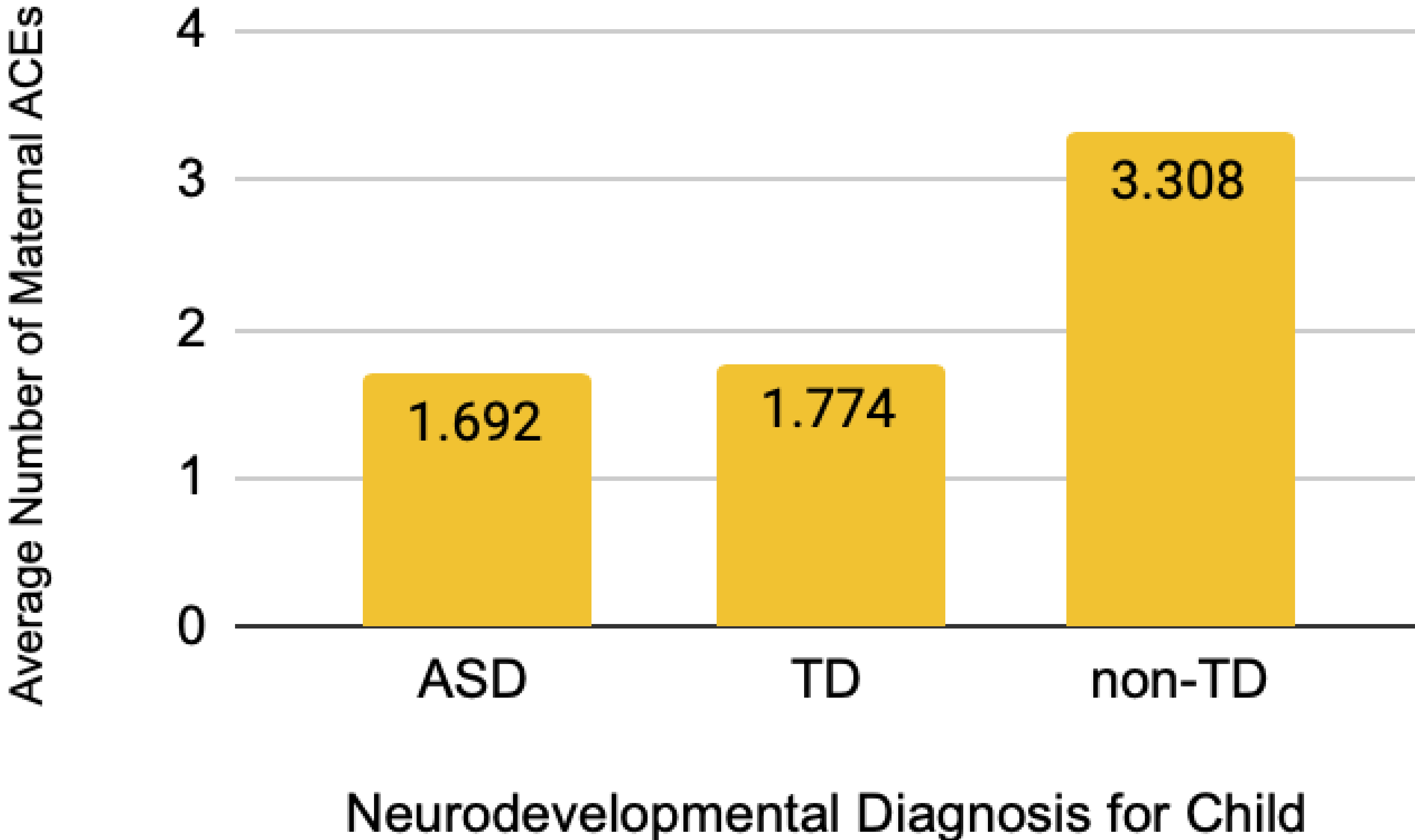
Parent Report Questionnaire - Number of Stressful Events



**Figure 3. Percentage of Respondents from Adult Report Questionnaire and Number of ACEs events for Child per Category of Child Neurodevelopmental Diagnosis**

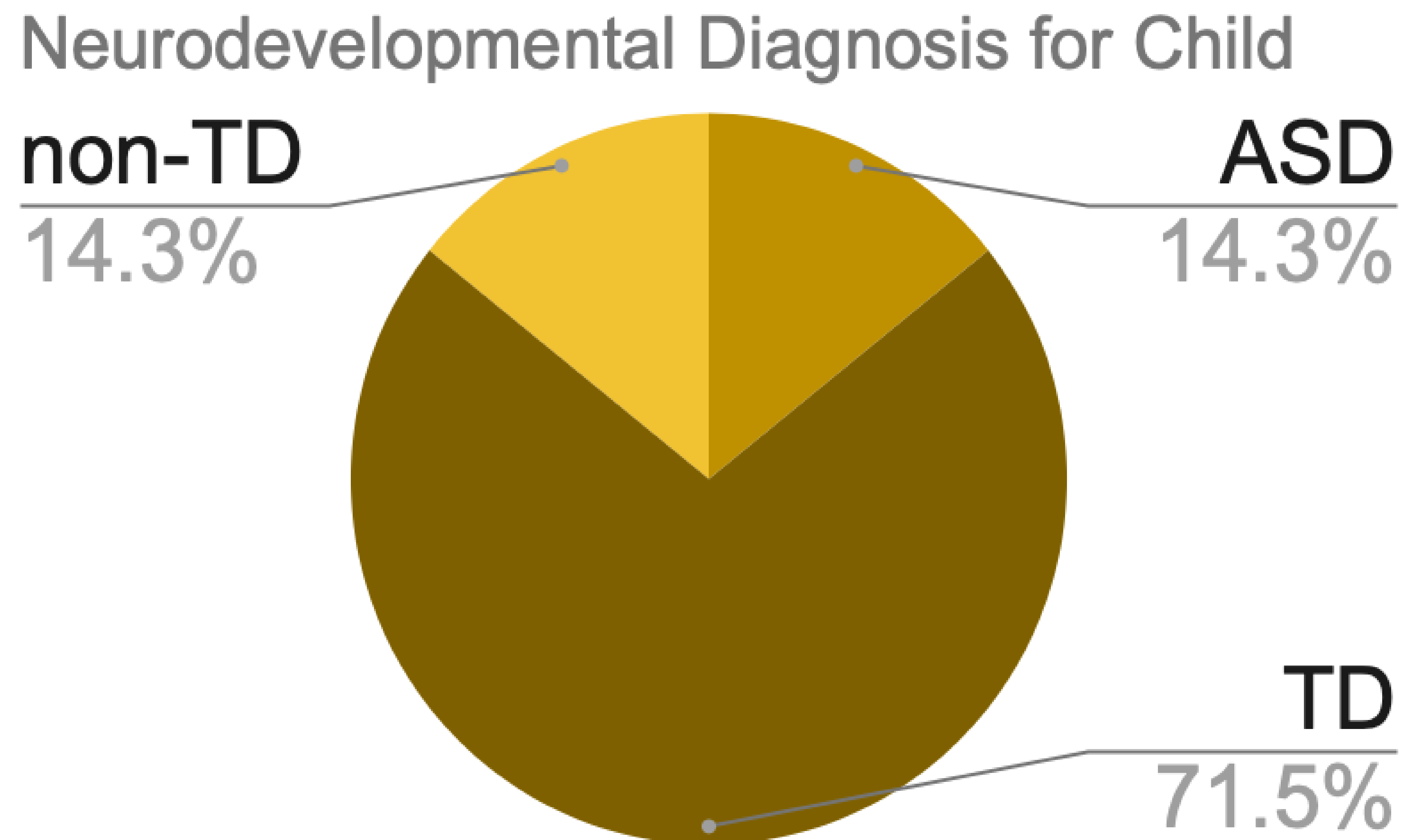


**Figure 4. Average Number of Maternal ACEs per category of neurodevelopmental diagnosis in child as reported in Adult Primary Version Questionnaire**



# RESULTS

**Figure 5. Percentage of Respondents from Adult Primary Version Questionnaire and Neurodevelopmental Diagnosis in Child**





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## References

