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## Background

Although several studies have aimed to investigate risk factors for occurrence of tics as well as determinants of tic remission or exacerbation, previous findings regarding this research questions were conflicting. Moreover, all of these studies were done in cohort of patients examined in centers specialized in tics and, therefore, in patients with more severe phenotype. To the best of our knowledge this is the first study analyzing the data from a **community-based cohort**.

## Methods

Our analysis was based on the **High-Risk Cohort Study for the Development of Childhood Psychiatric Disorders (HRC)**. It is an ongoing multicentric follow up study of 2511 children and adolescents who were born between the years of 1998 and 2004, and who live in the cities of Porto Alegre and São Paulo (Brazil) (Figure 1). Up to this date, assessments have already been made in three different phases: screening (2010), baseline (wave 0; 2010/2011), 3-year-follow up (wave 1; 2013/2014) and the 6-year (wave 2) follow-up (2017/2018). An extensive demographic, clinical evaluation and battery of psychological test was conducted in all participants. To define the presence of tics and phenomenology we have used data from the Development and Well-Being Assessment designed to generate ICD-10 and DSM-IV psychiatric diagnoses on 5-16-year-olds. Variety of perinatal, prenatal and psychological factors were taken into consideration in comparative and longitudinal analysis. We dispensed only with the baseline data and the data from the first follow up and therefore only these were included in the analysis.

## Results and Conclusions

Our baseline cohort **included 2511 participants** (1375 males, 54.8%). Lifetime history of tics was reported by 289 participants (11.5%). The mean age of tic onset was 6.83 (3.01 SD). When comparing baseline and follow up data, the incidence of **tics decreased from 23.2% to 10.4%** ( $p=0.08$ ), this trend was significant for **motor tics** ( $p<0.001$ ). When analyzing variety of prenatal and perinatal factors and their influence on tic **persistence lack of parent's support during their offspring's childhood** ( $p=0.012$ ) **influenced tic perseverance**. Other factors influencing tic persistence when comparing baseline and follow up assessments were **the history of bullying** ( $p=0.035$ ), **smoking at very young age** ( $p=0.034$ ), **history of behavioral treatment** ( $p=0.038$ ), **history of school suspension** ( $p=0.024$ ) and **referral to custody council** ( $p=0.040$ ) and **higher score in the Dimensional Yale-Brown Obsessive-Compulsive Scale** ( $p=0.025$ ).

To summarize, as expected, the incidence **of tics decreased with age**. Importantly, **several sociopsychological risk factors**, such as lack of parent's support, history of bullying or behavioral problems, were found to have impact on tic persistence. Detailed history taking should be considered not only in children with tics consulted at the specialized Tic Outpatient Clinics, but also by pediatricians in order to identify these individuals that are at greater risk of developing more severe phenotypes. A number of interventions targeting to reduce risk factors found in this study would help to diminish tic persistence over time.

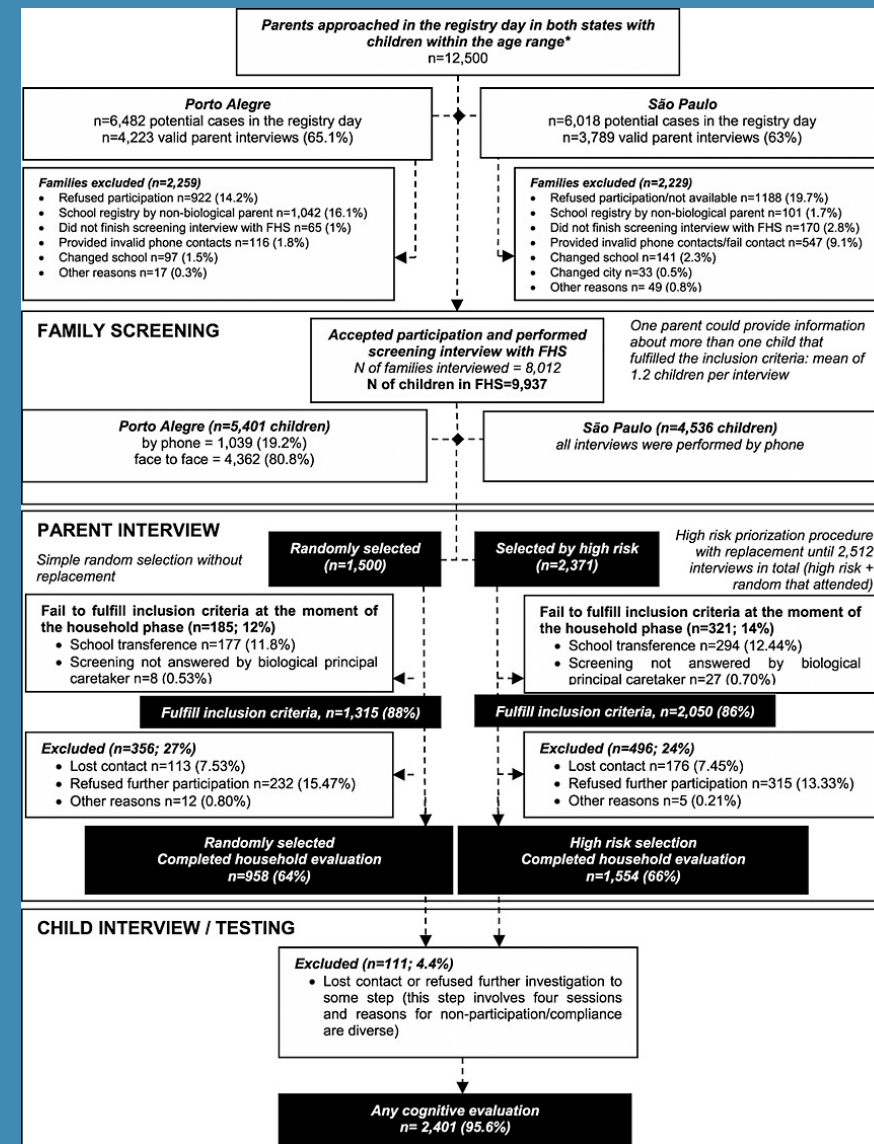


Figure 1. Flowchart of participants in the study.