Population profiles associated with severe functional difficulties and disability among 5-17 years-old children in México

Ariela Braverman-Bronstein, MPH,[1] Tonatiuh Barrientos-Gutiérrez, PhD,[1] Filipa de Castro, PhD,[1] Eduardo Lazcano-Ponce, D en C,[1] Rosalba Rojas-Martínez, PhD,[1] Vicente Terán, MSc.[2]

Braverman-Bronstein A, Barrientos-Gutiérrez T, de Castro F, Lazcano-Ponce E, Rojas-Martínez R, Terán V. Population profiles associated with severe functional difficulties and disability among 5-17-year-old children in México. Salud Publica Mex 2017;59:370-379.
https://doi.org/10.21149/8494

Abstract

Objectives. To report the prevalence of severe functional difficulties and disability (SFD) in a nationally representative sample of children ages 5 to 17 in Mexico, to identify factors associated with SFD, and population profiles predictive of SFD. **Materials and methods.** Using data from the National Survey on Children and Women we estimated prevalence and 95% confidence intervals of SFD and risk factors. We fitted bivariate and multivariate logistic regression models. We then examined which combinations of the sociodemographic factors best predicted SFD. **Results.** The prevalence of SFD was 11.2%. The most prevalent SFD were on the socioemotional dimension (8.3%). The associated risk factors in the three dimensions were: living in a poor household, being a boy, having a mother with basic education or less, and non-indigenous background or living in an urban area. **Conclusions.** Identifying groups of the population at higher risk for SFD provides useful information for targeted intervention implementation.

Keywords: disability; risk factors; population at risk

Braverman-Bronstein A, Barrientos-Gutiérrez T, de Castro F, Lazcano-Ponce E, Rojas-Martínez R, Terán V. Perfiles poblacionales asociados con dificultades funcionales y discapacidad severa en niños de 5-17 años en México. Salud Publica Mex 2017;59:370-379.
https://doi.org/10.21149/8494

Resumen

Objetivos. Reportar la prevalencia de dificultades funcionales y discapacidad severa (SFD) en una muestra nacional representativa de niños de 5 a 17 años en México; identificar los factores asociados con SFD; documentar los perfiles poblacionales que predicen SFD. **Material y métodos.** Se utilizaron los datos de la Encuesta Nacional de Niñas, Niños y Mujeres en México; se estimaron prevalencias e intervalos de confianza al 95%. Se ajustaron modelos bivariados y multivariados. Se examinaron las combinaciones de factores sociodemográficos que mejor predecían la SFD. **Resultados.** La prevalencia de SFD fue de 11.2%. Las SFD más prevalentes fueron en la dimensión socioemocional (8.3%). Los factores de riesgo asociados en las tres dimensiones fueron pobreza, ser hombre, tener una madre con educación primaria o menor, no ser indígena o vivir en zonas urbanas. **Conclusiones.** Identificar a los grupos con mayor riesgo de SFD dentro de la población proporciona información útil para el desarrollo de intervenciones.

Palabras clave: discapacidad; factores de riesgo; población en riesgo

(1) Centro de Investigación en Salud Poblacional, Instituto Nacional de Salud Pública. Ciudad de México, México.
(2) Oficina Regional de Latinoamérica y Caribe, Fondo de las Naciones Unidas para la Infancia. Panamá, Panamá.

Received on: January 12, 2017 • **Accepted on:** May 25, 2017
Corresponding author: Dra. Filipa de Castro. Dirección de Salud Reproductiva, Centro de Investigación en Salud Poblacional, Instituto Nacional de Salud Pública. 7a. Cerrada de Fray Pedro de Gante 50, col. Sección XVI. 14080 Tlalpan Ciudad de México, México.
E-mail: fcastro@insp.mx

The United Nations Convention on the Rights of Persons with Disabilities defines disability as "long-term physical, mental, intellectual or sensory impairments which, in interaction with various barriers, may hinder a person's full and effective participation in society on an equal basis with others".[1] In children, disabilities are mental, social or physical function limitations experienced by a child in comparison to other children of his or her age. Children with disabilities are an extremely vulnerable group, they are more likely to be victims of violence and to encounter barriers to exert their human rights.[2,3]

Despite the global interest in disability, there is little information about the situation of children with disability. The use of different definitions, questionnaires and methodologies pose serious challenges to obtain reliable regional and global estimates of disability. Despite these limitations, evidence suggests that there is a higher prevalence of children with disability in low and middle income countries compared to high income countries.[4] In Mexico, disability statistics are scarce. In 2014, more than 7 million people lived with disability (6% of the population), while 16 million reported at least one limitation to perform daily activities (13.2% of the population).[5] However, these statistics refer to the general population and not to children specifically; to our knowledge no estimates of children with disability or functional difficulties in Mexico are available.

Disability has been linked to several factors. During early childhood, girls experience a higher prevalence of disability; however, as children get older there is a shift in this trend and disability becomes more prevalent in boys.[6] Also, children from minority ethnic groups are at a higher risk of disability compared to other children.[1] Family characteristics also play an important role in disability, compared to children without disability, children with disability are more likely to live with a single parent, have mothers with lower education levels, and have mothers with higher rates of depression or health-related problems.[7] In Mexico, even though disability questions are included in national surveys, information on related factors for children with disability remains unknown.[8]

This study aimed to 1) estimate the prevalence of severe functional difficulties and disability (SFD) in a nationally representative sample of children ages 5 to 17 in Mexico, 2) identify factors associated with severe SFD, and 3) estimate the probabilities of severe physical, cognitive, and socioemotional SFD associated with discrete population profiles.

Materials and methods

This study is based on the 2015 National Survey of Children and Women (ENIM 2015, in Spanish), which was part of the 5th round of the UNICEF's Multiple Indicator Cluster Survey Programme.[9] Briefly, the ENIM 2015 was a multistage, stratified, and clustered national survey. The survey was designed to estimate a several health and well-being indicators for women and children, with representativeness for rural and urban areas, as well as for five regions: Northwest, Northeast, Central, Mexico City-State of Mexico, and South. Houses with children under 5-years old and in rural areas were oversampled to generate enough sample size for children under 5-years and the indigenous population. Four questionnaires were applied in electronic tablets: 1) household questionnaire; 2) women's questionnaire (for women 15 to 49); 3) a questionnaire for children and adolescents ages 5 to 17, given to their mothers; 4) a questionnaire for children under 5 years old, answered by their mothers. Further information about the ENIM 2015 can be found elsewhere.[10] All participants were required to provide signed informed consent before the beginning of the survey (for children and adolescents, it was provided by the legal guardian). All procedures were approved by the Research and Ethics Review Boards of the National Institute of Public Health of Mexico.

Outcome variables

Severe child functional difficulties and disabilities were measured using the UNICEF-Washington Group module included in the ENIM 2015. This module, designed to collect standardized comparable data on children with disabilities, is based on the International Classification of Functioning (ICF) framework and allows to identify children with severe functional difficulties in at least one of 14 domains: seeing, hearing, walking, dressing / feeding, being understood within the household, being understood outside the household, learning, memory, focusing, daily behavioral problems, daily anxiety symptoms, daily depression symptoms, difficulty accepting changes, and difficulty making friends. For analytical purposes, we grouped the 14 domains into three SFD dimensions: physical, cognitive, and socioemotional. Children were classified as having severe disability when the mother answered that the child had a lot of difficulty doing or could not do an activity at all, when anxiety and depression symptoms occurred every day, or when the child had more behavioral problems than other children. Children with severe seeing, hearing, walking or dressing / feeding

were classified as having a physical disability. Children with severe difficulty to be understood in or out their household, or with disability to learn, focus, or memorize were classified as having a cognitive disability. Children with daily anxiety, depression, behavioral problems, difficulty accepting changes, or difficulty making friends were classified as having a socioemotional disability.

Independent variables

We used data from the ENIM 2015's household questionnaire to obtain background characteristics, such as: ethnicity, quintiles of wealth, living in an urban or rural area, use of violent discipline methods (psychological or physical) in the house, and whether the child lived with both parents or not. From the women's questionnaire, we obtained information on maternal age, maternal education, and maternal depression symptoms. From the child's questionnaire, we obtained the child's age, gender, and data on educational lag (following the method described by Potrinos and Psacharopolous in 1996).[11]

Data analysis

We estimated the prevalence and 95% confidence intervals for sociodemographic, child, household, and maternal variables, as well as for the fourteen disability domains and three dimensions stratified by gender. In addition, we estimated bivariate associations between sociodemographic, household, maternal, and child characteristics and each disability dimension by using logistic regression models. We fitted a multivariate logistic regression model for each disability dimension with the following variables as predictors: poor or very poor households, non-indigenous households, households in urban areas, maternal education level basic or less, and the child's sex. The rest of the independent variables were excluded from this analysis because we cannot rule out reverse causality. We then examined which combinations of the sociodemographic factors found to be significant in the multivariate logistic regression model best predicted SFD in each dimension. To estimate this, we used post-estimation exploration to interpret each logistic model by computing predicted values of the outcome variable (physical, cognitive, or socioemotional SFD) for discrete combinations of the independent variables.[12] All the analyses were conducted in Stata 13* using the svy suite to account for the complex survey design.

* StataCorp. 2013. Stata Statistical Software: Release 13. College Station, TX: StataCorp LP

Results

A total of 11 607 children aged 5 to 17 years participated in the ENIM 2015, of which 50.7% were girls. The majority of children lived in a non-indigenous household (90.6%), in urban areas (73.6%), and 45.3% lived in a poor or very poor household. The majority of children were 10 to 14 years old (41.4%), lived with both parents (69%), and had no educational lag (94.7%). Adults in 43.4% of the households used psychological discipline and in 33.3% used physical discipline. Most of the mothers were 20 to 35 years old (41.8%), 28.3% had basic education level or less, and 20.9% presented depressive symptoms. There were no significant differences by child's gender (table I).

In table II we present the prevalence of SFD by domain. SFD in at least one domain were experienced by 11.2% of the children, boys having a higher prevalence compared to girls (12.7 and 9.7%, respectively). SFD seeing, hearing, walking, or dressing/feeding were observed in 2% of the children. SFD to be understood within or outside the household, learning, memorizing or focusing was reported by 3% of the children, with a higher prevalence in boys (4.1%) than girls (2.6%). In the socioemotional dimension, 8.3% of the children presented severe functional difficulties in at least one of the following domains: daily anxiety, daily depression, daily behavioral problems, accepting change or making friends.

The bivariate associations between SFD in the cognitive, socioemotional and physical dimensions, and household, child and mother's characteristics are presented in table III. Children living in the poorest households had higher odds of presenting physical or cognitive SFD compared to children in the richest households (physical OR 2.86, 95%CI 1.48,5.51; cognitive OR 2.81, 95%CI 1.63,4.86). Children living in urban areas had 33% higher odds of presenting a socioemotional SFD compared to children in rural areas (OR 1.33, 95%CI 1.05,1.69). Children living with only one parent were 46% more likely to present a socioemotional SFD and 43% more likely to present a cognitive SFD compared to children who live with both parents (OR 1.46, 95%CI 1.17,1.82; OR 1.43, 95%CI 1.01,2.04, respectively). Children of mothers with basic education had 2.56 and 2.38 higher odds of presenting a physical or cognitive SFD compared to children whose mother had college education (OR 2.56, 95%CI 1.26,5.2; OR 2.38, 95%CI 1.40,4.06, respectively). Children of mothers with maternal depression had twice the odds of presenting any SFD in any of the three dimensions, compared to children whose mothers had no depression symptoms (any SFD: OR 2.26, 95%CI 1.86,2.75; physical: OR 2.37,

Table I

DEMOGRAPHIC AND HOUSEHOLD CHARACTERISTICS OF CHILDREN 5 TO 17 YEARS OLD. MEXICO, ENIM 2015

	Boys *% [95%CI]*	*Girls* *% [95%CI]*	*Total* *% [95%CI]*
Demographic characteristics			
Head of household ethnicity			
Indigenous	9.5 [7.0,12.7]	9.3 [7.0,12.3]	9.4 [7.1,12.4]
Non indigenous	90.5 [87.3,93.0]	90.7 [87.7,93.0]	90.6 [87.6,92.9]
Wealth index			
Richest	16.0 [13.1,19.4]	18.3 [14.0,23.4]	17.1 [14.0,20.8]
Rich	17.1 [14.9,19.5]	16.4 [14.2,18.9]	16.8 [14.9,18.8]
Medium	21.8 [18.8,25.1]	20.0 [17.7,22.4]	20.9 [18.6,23.4]
Poor	21.1 [18.7,23.8]	21.2 [18.7,23.9]	21.2 [19.1,23.4]
Poorest	24.0 [21.1,27.2]	24.2 [21.3,27.4]	24.1 [21.4,27.0]
Area			
Rural	26.2 [22.5,30.2]	26.6 [23.1,30.4]	26.4 [23.0,30.0]
Urban	73.8 [69.8,77.5]	73.4 [69.6,76.9]	73.6 [70.0,77.0]
Region			
Northwest	20.6 [16.9,25.0]	19.1 [15.8,22.8]	19.9 [16.6,23.6]
Northeast	23.0 [20.3,26.0]	21.6 [18.8,24.7]	22.3 [19.8,25.1]
Central	14.9 [12.6,17.5]	16.2 [12.2,21.2]	15.6 [12.6,19.0]
DF-Edo México	19.8 [16.8,23.2]	19.9 [16.9,23.4]	19.9 [17.2,22.8]
South	21.6 [18.9,24.5]	23.2 [20.2,26.4]	22.4 [19.9,25.0]
Child characteristics			
Age in years			
5 to 9	38.0 [35.8,40.4]	37.8 [35.2,40.5]	37.9 [36.2,39.7]
10 to 14	40.6 [38.4,42.9]	42.2 [39.5,44.9]	41.4 [39.6,43.3]
15 and more	21.3 [19.5,23.3]	20.0 [18.1,22.0]	20.7 [19.3,22.1]
Educational lag			
None	94.3 [93.2,95.2]	95.2 [94.0,96.1]	94.7 [93.9,95.5]
Moderate	3.8 [3.1,4.8]	3.0 [2.4,3.8]	3.4 [2.9,4.1]
Severe	1.9 [1.4,2.5]	1.8 [1.3,2.4]	1.8 [1.4,2.3]
Household characteristics			
Lives with both parents			
Yes	68.4 [65.5,71.2]	69.6 [67.2,72.0]	69.0 [66.9,71.1]
No	31.6 [28.8,34.5]	30.4 [28.0,32.8]	31.0 [28.9,33.1]
Any psychological child discipline in the household			
Yes	42.3 [39.2,45.5]	44.4 [40.6,48.3]	43.4 [40.3,46.4]
No	57.7 [54.5,60.8]	55.6 [51.7,59.4]	56.6 [53.6,59.7]
Any physical child discipline in the household			
Yes	33.3 [30.6,36.3]	33.3 [29.4,37.6]	33.3 [30.5,36.4]
No	66.7 [63.7,69.4]	66.7 [62.4,70.6]	66.7 [63.6,69.5]
Maternal characteristics			
Maternal education level			
College	9.3 [7.6,11.4]	12.7 [9.0,17.6]	11.0 [8.5,14.0]
High school	17.8 [15.4,20.4]	17.2 [15.2,19.4]	17.5 [15.6,19.5]
Middle school	41.8 [38.9,44.9]	38.4 [35.0,41.8]	40.1 [37.4,42.9]
Basic	27.0 [24.4,29.7]	27.8 [25.2,30.5]	27.4 [25.1,29.7]
None	4.1 [3.3,5.2]	4.0 [3.0,5.2]	4.1 [3.3,5.0]
Maternal age			
15 to 19	0.1 [0.1,0.4]	1.1 [0.8,1.5]	0.6 [0.4,0.8]
20 to 35	42.0 [38.9,45.1]	41.7 [38.7,44.6]	41.8 [39.4,44.3]
35 and more	57.9 [54.7,61.0]	57.3 [54.3,60.2]	57.6 [55.1,60.0]
Maternal depression			
Yes	20.2 [18.1,22.6]	21.7 [19.2,24.3]	20.9 [18.9,23.1]
No	79.8 [77.4,81.9]	78.3 [75.7,80.8]	79.1 [76.9,81.1]

Table II
Children 5 to 17 years old with severe functional difficulties or disabilities in any of the domains. Mexico, ENIM 2015

	Boys % [CI]	*Girls* % [CI]	*Total* % [CI]
Seeing	0.7 [0.4,1.1]	1.0 [0.7,1.5]	0.8 [0.6,1.1]
Hearing	0.2 [0.1,0.4]	0.2 [0.1,0.5]	0.2 [0.1,0.4]
Walking	1.1 [0.8,1.6]	0.6 [0.4,0.8]	0.9 [0.7,1.1]
Dressing/feeding	0.6 [0.4,0.8]	0.3 [0.2,0.5]	0.4 [0.3,0.6]
Any physical disability	2.1 [1.7,2.7]	1.9 [1.4,2.5]	2.0 [1.8,2.4]
Being understood within household	0.7 [0.5,0.9]	0.6 [0.4,1.1]	0.6 [0.5,0.9]
Being understood outside household	1.2 [0.9,1.7]	0.7 [0.5,1.0]	1.0 [0.8,1.3]
Learning	2.5 [2.0,3.1]	1.2 [0.9,1.7]	1.9 [1.5,2.3]
Memory	1.7 [1.3,2.2]	0.9 [0.6,1.3]	1.3 [1.1,1.6]
Focusing	1.6 [1.1,2.2]	1.1 [0.7,1.6]	1.3 [1.0,1.7]
Any cognitive disability	4.1 [3.4,4.9]	2.6 [1.9,3.3]	3.3 [2.8,3.9]
Anxiety	6.1 [5.1,7.4]	4.8 [4.0,5.7]	5.5 [4.8,6.2]
Depression	1.4 [1.0,2.0]	1.7 [1.3,2.3]	1.5 [1.2,1.9]
Behavior	6.9 [5.9,8.1]	3.4 [2.6,4.5]	5.2 [4.5,6.0]
Accepting change	2.3 [1.7,3.2]	1.2 [0.9,1.6]	1.8 [1.4,2.2]
Making friends	1.9 [1.4,2.6]	1.6 [1.2,2.1]	1.8 [1.5,2.2]
Any Socioemotional disability	9.3 [8.1,10.7]	7.2 [6.2,8.3]	8.3 [7.5,9.2]
Percentage of children with severe functional difficulties in at least one domain	12.7 [11.3,14.2]	9.7 [8.5,11.2]	11.2 [10.3,12.3]
Percentage of children with severe functional difficulties in more than one domain	2.2 [1.7,3.0]	1.8 [1.4,2.3]	2.0 [1.6,2.5]

95%CI 1.59,3.53; cognitive OR: 2.79, 95%CI 2.03,3.84; socioemotional OR: 2.11, 95%CI 1.67,2.67). Children exposed to any psychological discipline in the household had 1.29 higher odds of presenting any SFD (OR 1.29, 95%CI 1.04,1.58) and 1.33 higher odds for socioemotional SFD compared to children without psychological discipline in the household (OR 1.33, 95%CI 1.05,1.69). Boys had higher odds than girls of presenting any SFD (OR 1.34, 95%CI 1.10,1.63), as well as cognitive (OR 1.61, 95%CI 1.21,2.15) or socioemotional SFD (OR 1.32, 95%CI 1.05,1.66).

Table IV and figure 1 present adjusted odds ratios of the sociodemographic predictors found to be significant in the previous analysis (poor households, sex, maternal basic education level, ethnicity or area). Based on the multivariate models we estimated the predicted probability of presenting SFD in each domain based on sociodemographic profiles. The adjusted population probability of presenting physical SFD among 5- to 17-years-old children was 2.03, 2.15% in non-indigenous households, 2.58% in children of mothers with primary or lower education level, and to 2.73% among children of mothers with primary or lower education levels that live in non-indigenous households. For cognitive SFD, the adjusted population probability was 3.25%, being 5.33% for boys living in poor or very poor households, 6.41% if children that had a mother with primary or lower education, and 6.77% if they lived in a non-indigenous household. As for socioemotional SFD, adjusted population probability of presenting SFD was 7.95%, increasing to 10.13% among boys living in urban areas.

Discussion

In this study we aimed to estimate the prevalence of SFD and disability in children ages 5 to 17 in Mexico, to identify associated factors, and to document how discrete population profiles predict physical, cognitive, and socioemotional SFD. We found that 11.2% of children 5 to 17-years old have a SFD in at least one of the 14 domains. The most prevalent SFD were on the socioemotional dimension (8.3%). The associated risk

Table III

Association between having at least one severe functional difficulty or disability and demographic, maternal, and characteristics of children 5 to 17 years old. Mexico, ENIM 2015

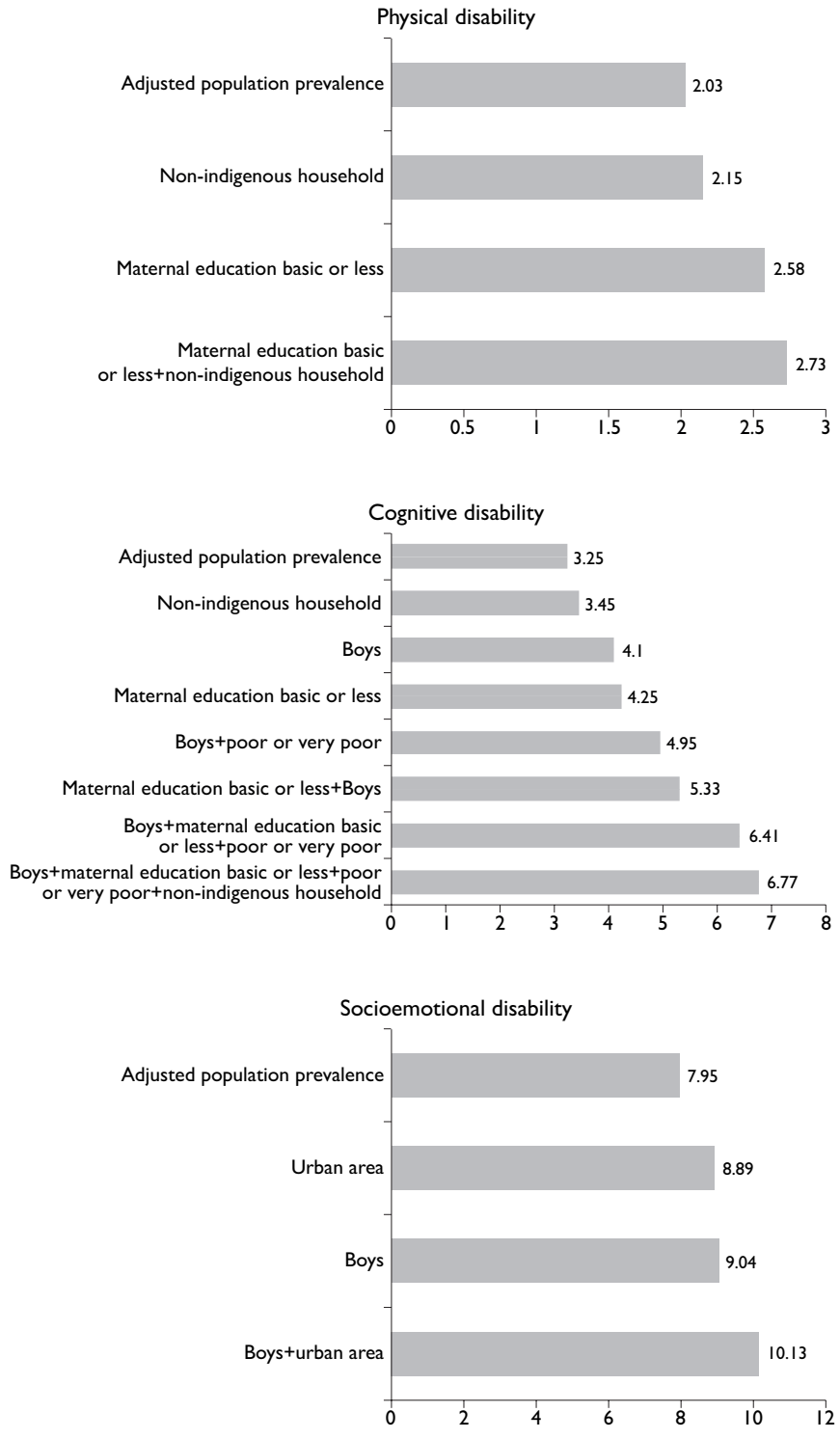
	Any disability OR [95%CI]	*Physical disability OR [95%CI]*	*Cognitive disability OR [95%CI]*	*Socioemotional disability OR [95%CI]*
Demographic characteristics				
Head of household's ethnicity				
Not indigenous	1	1	1	1
Indigenous	0.85 [0.59,1.22]	0.81 [0.48,1.36]	0.87 [0.58,1.29]	0.89 [0.57,1.39]
Wealth index				
Richest	1			
Rich	1.37 [0.92,2.04]	2.39 [1.26,4.50]	2.15 [1.14,4.06]	1.11 [0.71,1.72]
Medium	1.78 [1.21,2.62]	2.23 [1.08,4.62]	1.68 [0.83,3.42]	1.67 [1.10,2.55]
Poor	1.65 [1.10,2.47]	2.75 [1.40,5.38]	2.68 [1.50,4.81]	1.44 [0.92,2.24]
Poorest	1.41 [0.97,2.06]	2.86 [1.48,5.51]	2.81 [1.63,4.86]	1.05 [0.69,1.57]
Area				
Rural	1	1	1	1
Urban	1.15 [0.93,1.43]	0.82 [0.57,1.16]	0.79 [0.56,1.12]	1.33 [1.05,1.69]
Child characteristics				
Child gender				
Girls	1	1	1	1
Boys	1.34 [1.10,1.63]	1.15 [0.79,1.67]	1.61 [1.21,2.15]	1.32 [1.05,1.66]
Child age in years				
5 to 9	1	1	1	1
10 to 14	0.96 [0.77,1.19]	1.27 [0.82,1.96]	0.83 [0.57,1.18]	0.89 [0.69,1.32]
15 and more	0.86 [0.67,1.11]	1.00 [0.63,1.60]	0.87 [0.56, 1.35]	0.93 [0.70, 1.25]
Educational lag				
No	1	1	1	1
Moderate	1.26 [0.82,1.95]	1.55 [0.76,3.18]	2.73 [1.53,4.88]	1.15 [0.71,1.85]
Severe	2.55 [1.55,4.19]	4.95 [2.71,9.07]	6.36 [3.46,11.67]	2.88 [1.69,4.90]
Household characteristics				
Lives with both parents				
Yes	1	1	1	1
No	1.45 [1.19,1.77]	1.44 [0.96,2.15]	1.43 [1.01,2.04]	1.46 [1.17,1.82]
Any psychological child discipline in the household				
No	1	1	1	1
Yes	1.29 [1.04,1.59]	1.14 [0.79,1.65]	1.25 [0.87,1.79]	1.33 [1.05,1.69]
Any physical child discipline in the household				
No	1	1	1	1
Yes	1.23 [0.97,1.56]	1.19 [0.79,1.79]	1.23 [0.88,1.72]	1.28 [0.99,1.65]
Maternal characteristics				
Mother's age				
15 to 19	1	1	1	1
20 to 35	1.48 [0.43,5.10]	0.83 [0.56,1.22]	2.95 [0.56,15.41]	1.11 [0.31,3.96]
35 and more	1.18 [0.36,4.01]	NA	2.51 [0.47,13.35]	0.86 [0.24,3.04]
Mother's education				
College	1			
High school	1.35 [0.85,2.15]	1.23 [0.58,2.58]	1.56 [0.81,3.01]	1.25 [0.77,2.03]
Middle school	1.11 [0.73,1.70]	1.78 [0.90,3.51]	1.30 [0.77,2.19]	0.97 [0.63,1.50]
Basic	1.43 [0.95,2.17]	2.56 [1.26,5.20]	2.38 [1.40,4.06]	1.03 [0.67,1.57]
None	1.31 [0.72,2.39]	1.29 [0.46,3.63]	1.74 [0.82,3.68]	1.29 [0.70,2.35]
Maternal depression				
No	1	1	1	1
Yes	2.26 [1.86,2.75]	2.37 [1.59,3.53]	2.79 [2.03,3.84]	2.11 [1.67,2.67]

Table IV
Adjusted odds ratio and probabilities for the association of population profiles and severe functional difficulties and disability (SFD). Mexico, ENIM 2015

Physical disability	*OR*	*95% CI*
Non-indigenous household	1.61	0.93-2.76
Maternal education primary or less	1.47	1.01-2.16
Profile	*Prevalence of profile %*	*Probability of SFD*
Adjusted population prevalence	100	2.03 [1.68, 2.39]
Maternal education basic or less	31.41	2.58 [1.81, 3.35]
Non-indigenous household	90.59	2.15 [1.75, 2.55]
Maternal education basic or less + non-indigenous household	25.53	2.73 [1.85, 3.60]
Cognitive disability	*OR*	*95% CI*
Boys	1.61	1.21, 2.48
Non-indigenous household	1.6	1.03, 2.48
Poor or very poor	1.56	1.07, 2.26
Maternal education basic or less	1.55	1.15, 2.11
Profile	*Prevalence of profile %*	*Probability of SFD*
Adjusted population prevalence	100	3.25 [3.21, 4.67]
Boys	50.75	4.10 [3.36, 4.83]
Maternal education basic or less	31.41	4.25 [3.15, 5.35]
Non-indigenous household	90.59	3.45 [2.83, 4.07]
Boys + poor or very poor	22.91	4.95 [3.84, 6.05]
Maternal education basic or less + Boys	15.78	5.33 [3.91, 6.74]
Boys + maternal education basic or less + poor or very poor	11.61	6.41 [4.68, 8.14]
Boys + maternal education basic or less + poor or very poor + non-indigenous household	8.60	6.77 [4.79, 8.74]
Socioemotional disability	*OR*	*95% CI*
Urban area	1.39	1.05-1.84
Boys	1.33	1.06-1.67
Profile	*Prevalence of profile %*	*Probability of SFD*
Adjusted population prevalence	100	7.95 [7.14, 8.76]
Boys	50.75	9.04 [7.77, 10.32]
Urban area	73.60	8.89 [7.77, 10.07]
Boys + Urban area	37.40	10.13 [8.59, 11.67]

factors for physical, cognitive, and socioemotional SFD were: living in a poor household, being a boy, having a mother with basic education or less, and being from a non-indigenous background or living in an urban area.

There is a lack of consistent definitions and methodologies to measure disability at the population level; current estimates often underestimate the prevalence because of the low sensitivity of the instruments.[13] In 2011 UNICEF and the Washington Group on Disability and Statistics (WG) developed and instrument designed to measure disability in children ages 2 to 17; this instrument was included in the MICS survey, to produce a more reliable estimate of the prevalence of children with disability and to identify children at



* This figure describes the predicted probabilities of severe functional difficulties and disability (SFD) in each domain for discrete population profiles. In the three dimensions we observe that as we add risk factors to the profiles the predicted probability of SFD increases

FIGURE 1. PREDICTED PROBABILITIES FOR DISCRETE POPULATION PROFILES. MEXICO, ENIM 2015*

greater risk of suffering limited social participation due to a functional disability.[14]

Previous MICS rounds, using a different questionnaire on disability (TQ questionnaire) instead of the WG-UNICEF module, found that in most countries 14 to 35% of children ages 2- to 9-years-old screened positive to the disability module. Furthermore, they found that children from minority ethnic groups were at an increased risk of disability, disability prevalence was higher in rural areas, and there were no important differences by sex.[1] Mexico was one of the first countries to include the UNICEF-WG module in a national survey; hence, our results are not comparable to other MICS waves or national surveys. Still, some of our findings are consistent with previous literature. For instance, we observed an association between lower maternal education and higher odds of having disability; this finding is consistent with results from MICS 3 from other developing countries.[15] Similarly, Mexican children from the poorest quintile of wealth have higher odds of having a SFD, which has also been described in other countries.[16]

We found strong associations of SFD with maternal depression symptoms, violent or psychological discipline at home, and educational lag. A meta-analysis found that mothers of children with developmental disabilities are at higher risk of depression compared to mothers of children developing normally;[17] on the other hand, several studies report that children of mothers with depression have adverse consequences, such as behavior problems, deficits in cognitive performance and academic achievement. In addition, maternal depression is associated with disturbances in mother-child interaction.[18] In our study, we found an association between maternal depression and the odds of having a SFD; however, due to the cross-sectional nature of the data we cannot rule out reverse causality.

We were able to determine specific population profiles associated with a higher risk for disability; however, the nature and impact of such profiles differs according to the disability dimension. While for the physical dimension, the only associated factors were maternal education and non-indigenous background, we found that the prevalence of cognitive disability is associated with sex, maternal education, wealth and ethnic background. Children living in urban areas experienced a higher probability of socioemotional disability; this finding is interesting because previous studies on disability found an association with rural instead of urban areas.[19] However, these studies focused on disabilities in general, which could be present in different contexts and it is not necessarily associated with rural/urban status.

Recently, functional difficulties and disabilities have been recognized as an important public health problem and a barrier to access fundamental rights. The 2030 Agenda for Sustainable Development and the United Nations Sustainable Developing Goals have been conceived with the clear mandate of leaving no one behind and explicitly mention the need to address the needs of people with disability. Identifying groups of the population at higher risk for SFD provides useful information for designing and monitoring the implementation of targeted interventions. The findings from our study show that a significant proportion of children experience SFD and require special attention to guarantee their full social participation; this challenge must become a primary concern of the newly created Integral System for Children and Adolescent Protection (SIPINNA), to ensure children with disabilities can exercise their human rights, increase their participation within our society, and to improve their quality of life.

Acknowledgements

Funding: This paper was supported by Conacyt-FOSISS 2016 (Project No. 272137) funds.

Declaration of conflict of interests. The authors declare that they have no conflict of interests.

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