

Health and Sociocultural Disparities by Sex Characteristics in Chile

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Research Report

The lives of intersex people: Socioeconomic and health disparities in Mexico

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Intersex people and household income: Evidence from a nationally representative survey in Chile[☆]

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Agenda

Motivation

Data

Results

Complementary results: Chile and Mexico

Conclusion

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Motivation

- ▶ **Who are intersex individuals?**
 - ▶ Sex characteristics don't fit typical binary notions (male/female)
 - ▶ Variations in genitals, gonads, chromosomes, hormone patterns
 - ▶ May be visible at birth, during puberty, or not physically apparent
- ▶ **Research objectives:**
 - ▶ Estimate size of intersex population in Chile
 - ▶ Analyze socioeconomic and health disparities
- ▶ **Data:** National Health, Sexuality, and Gender Survey (ENSSEX 2022-2023)

Contribution to Literature

▶ **Gaps in existing research:**

- ▶ Most studies use non-representative samples (Suen, Chan and Badgett, 2021)
- ▶ Limited number of respondents
- ▶ Reliance on medical records only

▶ **Our contribution:**

- ▶ Focus on understudied subgroup within LGBTQI+ community
- ▶ Intersex status rarely measured in population surveys

Chile: Data and Context

- ▶ **Survey:** National Health, Sexuality, and Gender Survey (ENSSEX 2022-2023)
 - ▶ Nationally representative household survey by the Health Ministry
 - ▶ 20,392 respondents aged 18+
 - ▶ Analysis sample: 15,763 individuals aged 18-64

Key Variables

Sex Assigned at Birth

“What is your sex assigned at birth?”

- ▶ Male
- ▶ Female

Intersex Status

“Are you an intersex person?”

- ▶ Yes → **Intersex**
- ▶ No → **Endosex**
- ▶ Does not know/Does not answer (6.0%)

Sample Size, Individuals Aged 18–64 Years

- ▶ **Key finding:** Intersex individuals represent 2.77% of population aged 18-64
- ▶ Consistent with global estimates: 0.05% - 4% (varies by definition and methodology)

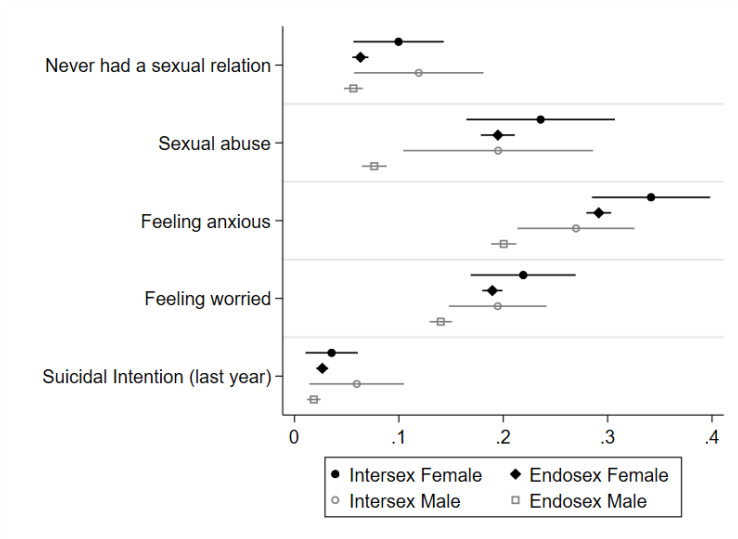
	Unweighted		Weighted	
	Observations	Percentage	Observations	Percentage
Intersex	530	3.36	299,227	2.77
Male	199	37.55	167,539	55.99
Female	331	62.45	131,688	44.01
Endosex	15,233	96.64	10,493,074	97.23
Male	5,156	33.85	5,212,447	49.68
Female	10,077	66.15	5,280,627	50.32

Descriptive Statistics by Intersex Status

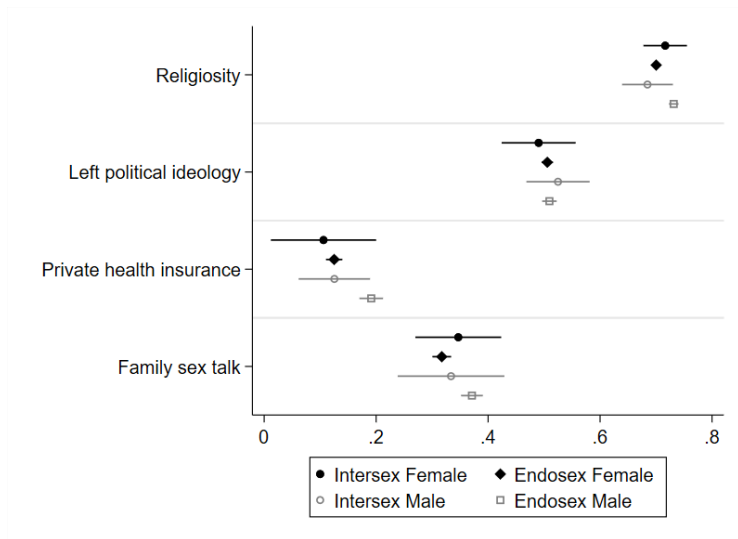
- ▶ Higher rates of LGBTQ+ orientations among intersex individuals
- ▶ Transgender and gender diverse identification 8+ pp higher than endosex groups

	Endosex female (1)	Endosex male (2)	Intersex female (3)	Intersex male (4)	(3) – (1) (5)	(4) – (2) (6)
<i>Sexual Orientation and Gender Identity</i>						
Bisexual	0.030 (0.170)	0.010 (0.098)	0.101 (0.301)	0.044 (0.205)	0.071*** [0.009]	0.034* [0.075]
Gay/Lesbian	0.010 (0.098)	0.024 (0.152)	0.066 (0.248)	0.135 (0.343)	0.056** [0.017]	0.111*** [0.001]
Other sexual orientation	0.006 (0.078)	0.007 (0.081)	0.039 (0.193)	0.010 (0.098)	0.033 [0.200]	0.003 [0.633]
Transgender and gender diverse	0.006 (0.079)	0.014 (0.118)	0.115 (0.320)	0.097 (0.297)	0.109*** [0.002]	0.083*** [0.002]
Observations	5,156	10,077	331	199		

Sexual and Mental Health Experiences



Sociocultural and Institutional Characteristics



Empirical Strategy: Health Disparities

Regression Equation

$$y_i = \beta_0 + \beta_1 \text{Intersex female} + \beta_2 \text{Endosex female} + \beta_3 \text{Intersex male} + X_i \gamma + \epsilon_i$$

- ▶ **Dependent variables:** Binary indicators for:
 - ▶ Sexual experiences (never had sexual relation, sexual abuse)
 - ▶ Mental health (feeling anxious, worried, suicidal intention)
- ▶ **Reference category:** Endosex male
- ▶ **Controls (X_i):**
 - ▶ Sociodemographic: age, age², education, indigenous status, marital status, location
 - ▶ SOGI: bisexual, gay/lesbian, other sexual orientation, trans+
- ▶ **Estimation:** OLS with survey weights and strata

Sexual Outcomes by Sex Assigned at Birth and Intersex Status (part 1)

	Never had a sexual relation	Sexual abuse
Intersex Female	0.024 (0.022)	0.121*** (0.034)
Endosex Female	0.008 (0.005)	0.115*** (0.009)
Intersex Male	0.030 (0.033)	0.125** (0.051)
Bisexual	-0.027 (0.023)	0.282*** (0.043)
Gay/Lesbian	-0.028 (0.023)	0.026 (0.039)
Other sexual orientation	-0.070** (0.035)	0.111** (0.052)
Transgender and gender diverse	0.019 (0.043)	0.133** (0.066)
Constant	0.800*** (0.047)	-0.098** (0.043)
Observations	13,641	13,641
R-squared	0.140	0.055
Average dep variable	0.058	0.139

Sexual Outcomes by Sex Assigned at Birth and Intersex Status (part 2)

	Feeling anxious	Feeling worried	Suicidal Intention
Intersex Female	0.153*** (0.033)	0.067** (0.027)	-0.006 (0.016)
Endosex Female	0.086*** (0.008)	0.047*** (0.007)	0.006 (0.005)
Intersex Male	0.054* (0.030)	0.037 (0.026)	0.033 (0.027)
Bisexual	0.118*** (0.024)	0.077** (0.030)	0.042* (0.025)
Gay/Lesbian	0.050 (0.033)	0.001 (0.023)	0.006 (0.019)
Other sexual orientation	0.103*** (0.038)	0.024 (0.033)	0.013 (0.030)
Transgender and gender diverse	0.085* (0.044)	0.117*** (0.044)	0.114** (0.053)
Constant	0.328*** (0.039)	0.176*** (0.035)	0.055*** (0.019)
Observations	13,641	13,641	13,641
R-squared	0.055	0.023	0.018
Average dep variable	0.245	0.161	0.023

Main Findings: Chile - Health Disparities

Sexual Violence

Critical victimization gap for intersex males:

- ▶ Intersex males: **12.5 pp higher** than endosex males (similar to intersex females)
- ▶ Bisexual individuals: **28.2 pp higher** than heterosexuals (largest penalty)

Mental Health Disparities

Elevated anxiety and distress persist after controls:

- ▶ Intersex females: **+15.3 pp** feeling anxious, **+6.7 pp** worried (vs. endosex males)
- ▶ Intersex males: **+5.4 pp** feeling anxious (vs. endosex males)

Complementary results

- ▶ *Intersex people and household income: Evidence from a nationally representative survey in Chile*
- ▶ *The lives of intersex people: Socioeconomic and health disparities in Mexico*

Empirical Strategy: Household Income

Regression Equation

$$y_i = \beta_0 + \beta_1 \text{Intersex female} + \beta_2 \text{Endosex female} + \beta_3 \text{Intersex male} + X_i \gamma + \epsilon_i$$

- ▶ **Dependent variable:** Log of monthly household income
- ▶ **Reference category:** Endosex male
- ▶ **Controls (X_i):**
 - ▶ Sociodemographic: age, age², education, indigenous status, marital status, location
 - ▶ SOGI: bisexual, gay/lesbian, other sexual orientation, trans+
- ▶ **Estimation:** OLS with survey weights and strata

Main Findings: Chile - Household Income

Substantial Income Penalty

Intersex individuals belong to households with significantly lower income:


- ▶ **Intersex female:** 28.1 log points lower than endosex male
- ▶ **Intersex male:** 27.9 log points lower than endosex male

Persistence After Controls

Income disparities remain significant even after controlling for Sociodemographic characteristics and SOGI


- ▶ **Intersex male:** 31% reduction in penalty (largest decrease)
- ▶ **Endosex female:** 14% reduction (smallest decrease)

Data Source: ENDISEG Mexico

- ▶ **Survey:** National Survey on Sexual and Gender Diversity
 - ▶ First nationally representative survey by national statistics office (INEGI)
 - ▶ Middle-income country context
 - ▶ LGBTQI+ individuals aged 15+
- ▶ **Intersex prevalence:** 1.6% of population aged 15-64 
 - ▶ Lower than Chile (2.77%)
 - ▶ Within global estimates range
 - ▶ 59% assigned male, 41% assigned female at birth
- ▶ **Measurement:** Direct question: Were you born with any variation in your body related to your sex, such as in genitals, hormonal levels, or other?

Descriptive Statistics

- ▶ Higher rates of LGBTQ+ orientations among intersex individuals
- ▶ Trans+ identification 7+ pp higher than endosex groups

	Endosex female (1)	Endosex male (2)	Intersex (3)	(3) – (1) (4)	(3) – (2) (5)
<i>Sexual orientation and gender identity</i>					
Bisexual	0.04 (0.19)	0.01 (0.11)	0.05 (0.21)	0.01 [0.49]	0.03*** [0.00]
Gay/Lesbian	0.01 (0.10)	0.03 (0.16)	0.04 (0.20)	0.03*** [0.00]	0.02* [0.08]
Other sexual orientation	0.01 (0.08)	0.00 (0.06)	0.02 (0.15)	0.01* [0.08]	0.02** [0.03]
Trans+ 	0.01 (0.10)	0.01 (0.09)	0.08 (0.28)	0.07*** [0.00]	0.08*** [0.00]
Observations	18,866	15,730	608		

Main Findings: Mexico

- ▶ **Education:** 14-15 pp lower post-secondary completion
 - ▶ Major barrier to economic mobility
- ▶ **Life cycle adversity:**
 - ▶ **26%** experienced childhood bullying (vs. 15% endosex)
 - ▶ Persistent harassment and violence into adulthood
- ▶ **Mental health disparities:**
 - ▶ **13%** report suicidal intention
 - ▶ 2-3× higher than endosex populations (6% female, 4% male)
- ▶ **Labor market:**
 - ▶ **15%** faced workplace rejection (8-9 pp higher than endosex)
 - ▶ Lower participation

Conclusion

Two countries, one story:

Intersex individuals face systematic disadvantages across education, labor markets, health, and well-being

These findings provide space for policy action:

- ▶ Legal protections against discrimination and non-consensual medical interventions
- ▶ Data collection to maintain visibility and monitor progress
- ▶ Evidence-based policies addressing structural barriers

Thank you!

Questions?

P.S. I'm applying to PhD programs this year :-)
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Literature

Research on intersex populations:

- ▶ Prevalence estimates: 0.05–4% of global population (Blackless et al., 2000; Nordenvall et al., 2014; Zeeman & Aranda, 2020)

Economics of sexual and gender minorities:

- ▶ *Global evidence*: Badgett et al. (2021; 2024) on socioeconomic outcomes of LGBTQ+ individuals
- ▶ *New Zealand*: Carpenter et al. (2024; 2025) on sexual orientation and gender identity
- ▶ *Latin America*:
 - ▶ Chile: Nettuno (2024) on gender identity and labor markets
 - ▶ Brazil: Tampellini (2024) on sexual minorities' outcomes

Sample Size, Individuals Aged 18+

	Unweighted		Weighted	
	Observations	Percentage	Observations	Percentage
Intersex	625	3.28	337,427	2.64
Male	236	37.76	186,874	55.38
Female	389	62.24	150,553	44.62
Endosex	18,414	96.72	12,463,969	97.36
Male	6,199	33.66	6,041,393	48.47
Female	12,215	66.34	6,422,575	51.53

Descriptive Statistics by Intersex Status ◀

	Endosex female (1)	Endosex male (2)	Intersex female (3)	Intersex male (4)	(3) – (1) (5)	(4) – (2) (6)
<i>Sociodemographic Characteristics</i>						
Age	39.648 (13.069)	38.928 (12.896)	38.006 (13.303)	38.785 (12.779)	-1.643 [0.127]	-0.143 [0.908]
Indigenous	0.103 (0.304)	0.099 (0.298)	0.078 (0.269)	0.092 (0.290)	-0.025 [0.229]	-0.006 [0.806]
Married or partnered	0.438 (0.496)	0.419 (0.493)	0.362 (0.481)	0.430 (0.496)	-0.076* [0.064]	0.011 [0.828]
Divorced, widowed, or separated	0.125 (0.331)	0.083 (0.276)	0.144 (0.352)	0.111 (0.315)	0.019 [0.523]	0.028 [0.378]
Secondary	0.583 (0.493)	0.597 (0.491)	0.583 (0.494)	0.643 (0.480)	-0.001 [0.989]	0.046 [0.272]
Postsecondary	0.294 (0.455)	0.321 (0.467)	0.296 (0.457)	0.225 (0.419)	0.003 [0.960]	-0.095** [0.037]
Observations	5,156	10,077	331	199		

Trans+ definition

According to INEGI, the **trans+** gender identity is a social construct arising from an individual's internal experience of a gender that diverges from the traditional roles expected given their sex assigned at birth. In other words, how they live and experience their body from a personal standpoint and how they navigate their body in public do not conform to societal norms.

Sample Size, Individuals Aged 15-64 Years

- ▶ **Key finding:** Intersex individuals represent **1.6%** of population aged 15-64
- ▶ Consistent with global estimates: 0.05% - 4% (varies by definition and methodology)

	Unweighted		Weighted	
	Observations	Percentage	Observations	Percentage
Intersex	608	1.73	1,282,296	1.61
Male	358	58.88	756,650	59.01
Female	250	41.12	525,646	40.99
Endosex	34,596	98.27	78,602,929	98.39
Male	15,730	45.47	37,053,134	47.14
Female	18,866	54.53	41,549,795	52.86

Descriptive Statistics (part 1/3)

	Endosex female (1)	Endosex male (2)	Intersex (3)	(3) – (1) (4)	(3) – (2) (5)
<i>Sociodemographic characteristics</i>					
Age	37.61 (13.82)	37.04 (14.05)	36.38 (14.82)	-1.23 [0.14]	-0.66 [0.44]
Indigenous	0.10 (0.30)	0.12 (0.32)	0.17 (0.38)	0.07*** [0.00]	0.05** [0.01]
African descendant	0.02 (0.14)	0.03 (0.18)	0.04 (0.19)	0.01* [0.09]	0.00 [0.80]
Skin tone	6.88 (1.22)	6.54 (1.34)	6.54 (1.48)	-0.34*** [0.00]	0.00 [0.96]
Observations	18,866	15,730	608		

Descriptive Statistics (part 2/3)

	Endosex female (1)	Endosex male (2)	Intersex (3)	(3) – (1) (4)	(3) – (2) (5)
<i>Household composition</i>					
Married or partnered	0.57 (0.50)	0.58 (0.49)	0.54 (0.50)	-0.03 [0.31]	-0.04 [0.13]
Divorced, widowed, or separated	0.14 (0.35)	0.07 (0.26)	0.09 (0.28)	-0.05*** [0.00]	0.02 [0.23]
Household size	4.33 (1.98)	4.25 (1.91)	4.11 (1.75)	-0.22** [0.04]	-0.15 [0.17]
Children at home	0.57 (0.50)	0.51 (0.50)	0.50 (0.50)	-0.07** [0.02]	-0.01 [0.81]
Observations	18,866	15,730	608		

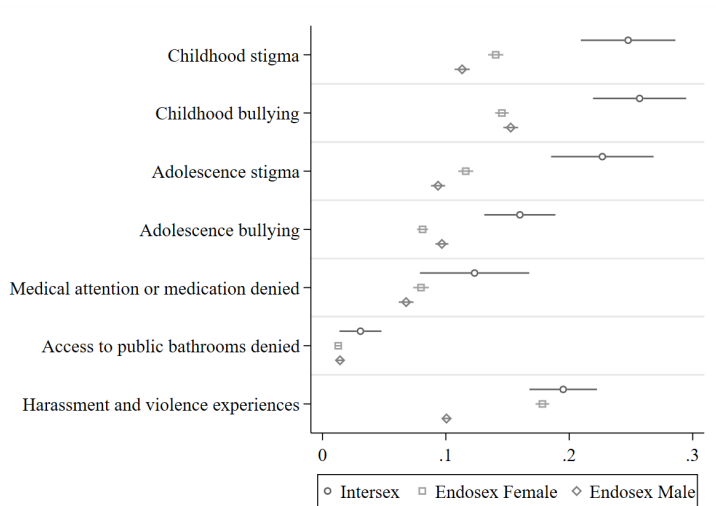
Descriptive Statistics (part 3/3) ◀

- ▶ Secondary education completion comparable across groups
- ▶ Large disparities in post-secondary education
- ▶ Suggests potential barriers to educational access for intersex individuals

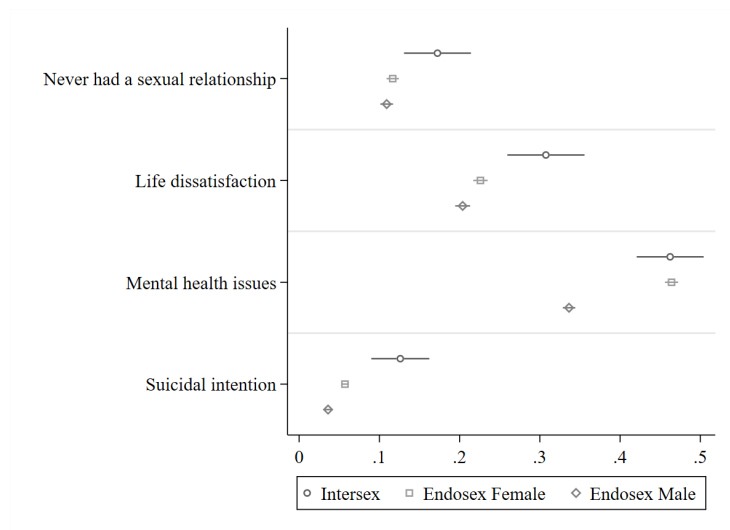
	Endosex female (1)	Endosex male (2)	Intersex (3)	(3) – (1) (4)	(3) – (2) (5)
<i>Education</i>					
Secondary	0.26 (0.44)	0.28 (0.45)	0.27 (0.44)	0.00 [0.96]	-0.01 [0.67]
Post-secondary	0.25 (0.43)	0.26 (0.44)	0.11 (0.31)	-0.14*** [0.00]	-0.15*** [0.00]
Observations	18,866	15,730	608		

	Log of household income		
	(1)	(2)	(3)
Intersex female	-0.281*** (0.075)	-0.248*** (0.079)	-0.232*** (0.080)
Endosex female	-0.250*** (0.025)	-0.213*** (0.021)	-0.214*** (0.021)
Intersex male	-0.279*** (0.069)	-0.206*** (0.066)	-0.192*** (0.065)
Bisexual			-0.025 (0.064)
Gay/Lesbian			-0.024 (0.063)
Other sexual orientation			-0.079 (0.086)
Transgender and gender diverse			-0.127 (0.083)
Constant	6.668*** (0.021)	5.497*** (0.112)	5.512*** (0.110)
Sociodemographic controls	No	Yes	Yes
Observations	11,183	11,183	11,183
R-squared	0.028	0.219	0.220

Adverse events over the life cycle (1/3)



Disparities in well-being and sexual experiences (2/3)



Labor market disparities and workplace rejection (3/3) ◀

