

A Geospatial and Temporal Retrospective Analysis of Perinatal Outcomes in Chile from 1993 - 2018

W. Conor Rork, BA, Columbia University Vagelos College of Physicians and Surgeons Class of 2026
 Mentors: Estela Blanco, PhD, MPH, MA, Universidad Mayor; Carol Hutchinson, PhD, Mailman School of Public Health

Research Question: Did geospatial demographic differences at the Chilean regional level affect changes in perinatal outcomes from 1993 – 2018?

BACKGROUND

Preterm birth and its sequelae are the leading cause of death in children under five, while more than 80% of newborn deaths occur in low birthweight infants. Previous research on perinatal health in Chile indicated that temporal changes in maternal demographic factors may be driving increases in preterm births at the country-level. Little is known, however, about how these factors and others, including paternal factors, differ and influence perinatal outcomes across Chilean regions.

DESCRIPTION OF ORGANIZATION

The mission of the Center for Research in Society and Health (CISS) is to promote well-being at the individual, social, and institutional levels in a global context of demographic, epidemiological, technological, and environmental change. To fulfill this mission, the goals of the center are to conduct excellent interdisciplinary research with practical and public policy implications, train new researchers, and disseminate evidence to broad audiences.

TABLES

Changes in Preterm Birth Rate by Chilean Region and Zona from 1993 – 2018

Zona	Region	RegionMean%	ZonaMean%	1993	2018	%Change
ZonaNG	Region XV	4.67				
	Region I	5.15				
	Region II	5.94	5.48	4.96	6.64	33.82
ZonaNC	Region III	5.31				
	Region IV	5.01	5.10	3.90	6.36	63.35
ZonaC	Region V	5.76				
	Region M	6.24				
	Region VI	5.21				
	Region VII	5.13				
	Region XVI	5.06				
	Region VIII	5.71	5.91	4.61	7.18	55.74
ZonaS	Region IX	5.12				
	RegionXIV	5.44				
	Region X	5.58	5.36	4.67	7.09	51.94
ZonaA	Region XI	5.2				
	Region XII	6.46	5.94	5.04	6.26	24.28

Changes in Distribution of Maternal Age by Region in Chile

	< 20 (%)			> 35 (%)			overall mean (years)
	1993	2018	Δ	1993	2018	Δ	
Reg I	12.3	7.3	-40%	10.7	18.4	73%	27.1
Reg II	13.9	6.9	-50%	10.9	16.9	55%	26.8
Reg III	14.1	6.9	-51%	11.1	18.4	66%	26.8
Reg IV	16.1	7.7	-52%	11.2	18.6	66%	26.8
Reg V	12.6	6.1	-52%	12.5	19.7	58%	27.5
Reg VI	13.1	6.4	-51%	12.0	19.3	61%	27.3
Reg VII	13.8	6.6	-52%	12.0	18.8	57%	27.3
Reg VIII	11.5	5.9	-49%	11.7	20.5	75%	27.5
Reg IX	12.5	8.0	-37%	13.0	19.4	49%	27.2
Reg X	14.2	6.7	-53%	9.9	19.7	99%	27.0
Reg XI	15.4	7.2	-53%	11.8	18.6	57%	27.0
Reg XII	8.4	4.6	-45%	13.5	22.8	70%	27.8
Reg M	11.1	4.8	-57%	12.7	21.8	72%	27.9
Reg XIV	14.2	6.7	-53%	10.4	19.7	90%	27.0
Reg XV	12.5	7.5	-40%	11.0	18.7	70%	27.4
Reg XVI	12.8	6.3	-51%	12.7	18.8	48%	27.5

METHODS

Chilean birth records from 1993 – 2018 were obtained from the Department of Statistics and Health Information. After excluding incomplete and improbable data (based on maternal age, gestational age, birth weight) and adjusting for fixed cohort bias, 5,564,930 birth records were included in the final analysis. Researchers analyzed both maternal and paternal demographic factors (age, civil status, employment, educational level), geographic factors (urban/rural, hospital/home birth, region and macrozone), and birth factors (multiplicity, weight, gestational age).

Changes in both maternal and paternal factors over the time period varied by Chilean region, and may have driven regional differences in birth outcomes like preterm birth and low birth weight.

DISCUSSION

While this study has limitations due to its nature as a secondary analysis, novel exploratory findings indicating regional differences in perinatal outcomes and risk factors in Chile indicate the need for further investigation and may aid in the development of regional-level interventions to address disparities.

REFERENCES

Lopez, Paulina O, and Gérard Bréart. "Trends in gestational age and birth weight in Chile, 1991-2008. A descriptive epidemiological study." *BMC pregnancy and childbirth* vol. 12 121. 2 Nov. 2012, doi:10.1186/1471-2393-12-121.

Araya, B M et al. "Association between preterm birth and its subtypes and maternal sociodemographic characteristics during the post-transitional phase in a developing country with a very high human development index." *Public health* vol. 147 (2017): 39-46. doi:10.1016/j.puhe.2017.01.027