

## **The diversity of fertility trends in Mexico. A theoretical challenge.**

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### **Abstract**

Over the last two decades, we have explored fertility change in Mexico with data from three rounds of the Demographic Retrospective Survey (EDER). The pace of the fertility transition toward the parameters of demographically advanced countries varies across population segments. The Mexican case is peculiar for the coexistence of modern and old reproductive patterns, which are not exclusively explained by educational or material inequalities between individuals and their families of origin, but also by regional cultural expectations about the stages of family formation. Our challenge is to consider the intersectionality of the explanatory factors proved so far, including the cultural dimension specific to the regions, in order to correctly describe specific trends and better inform national projections by recognizing the relative importance of different subpopulations in population growth and structure.

### **Introduction**

The passage from a regime of high fertility and mortality to a regime of low fertility and mortality has been explained as a process of phases: the first, when both mortality and birth rates are high; the second when mortality declines but birth rates remain high; and a third one when both mortality and birth rates are low.

These population transitions occurred in European countries between the second half of the eighteenth century and the end of the nineteenth century, and then in the early twentieth century in countries with a majority European population, such as Australia, New Zealand, the United States and Canada. Then, during the 20th century, demographic transitions also began, more or less delayed, in developing countries and are still ongoing there (Cosío-Zavala, 2012).

For the Mexican case, during the past two decades we have explored the fertility transition in Mexico with data from three rounds of the Demographic Retrospective Survey (EDER). We have observed that the process of change has had its peculiarities: fertility declined rapidly from 1970 onwards, but, in general, the decline was not due to a delay in the reproductive calendar or the spacing of children. Even now, unions and marriages continue to occur early compared to what happens in developed countries, and they are closely followed by the first and, most of the time, the second childbirth. Therefore, to control the enlargement of the family, durable or definitive contraceptive methods are often used. Depending on the decade to reference, the use of the intrauterine device or hormonal implants has prevailed, but above all, a significant number of bilateral tubal occlusions around the age of 30.

But in addition to this profile, it has been interesting to observe that the trends do not follow the same tempo: the great diversity in the pace of transition is explained by several factors; the first ones explored were logically those associated with the level of development such as the size of the locality (rural/urban), the level of education, and the socioeconomic strata, but eventually, we have found that the fertility trajectories are framed especially from regionally derived cultural contexts and expectations.

Two models of demographic transition had been defined for the region. The first is equivalent to that occurred in Europe and in the most developed countries, prevailing in the privileged social strata, those who lived in large cities, the richest and most educated subgroups of the population, who changed radically their demographic behavior, based on the improvement of economic and social conditions, and a more modern attitude towards health and reproduction. A second model applies mainly to the rural populations and the urban poor, which have maintained traditional demographic attitudes for a longer period of time, but where fertility has declined induced by precarious living conditions and an abundant supply of contraceptives (Cosío-Zavala, 2012).

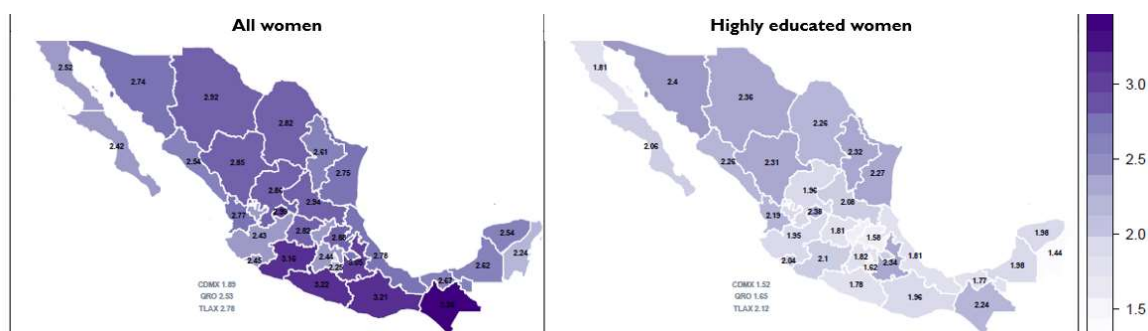
The data from EDER 1998 showed that the decline in fertility was slower in rural than in urban areas and that the timing of marital unions dictated the timing of births (Zavala de Cosío, 2005). By 2011, the year in which the EDER was conducted only in metropolitan areas, we found that the diversity in the pace of the reproductive transition was largely

explained by differences in the level of schooling, but mostly due to social origin (Páez & Zavala, 2016). In 2017, the survey was ten times larger (a sample of 32 000 dwellings) and it was then possible to analyze, in addition, regional differences. The retrospective data with the possibility of disaggregation at the state level allowed us to validate the existence of different reproductive regions in the country that earlier research had identified with cross-sectional data (Cosío Zavala, 1994).

To exemplify the territorial interference in the fertility indicators, we show in Figure 1 that, in general, women in the south of the country have the highest average of children at the end of their reproductive lives (more than 3 on average), but when considering only the most educated women, the highest rates are reached by women from the north of the country. This reveals a reproductive pattern that responds not only to differences in social origin and inequalities expressed throughout the life course but also to cultural standards prevailing in different regions of the country.

**Figure 1**

Average final offspring by federative entity (women aged 40 and over)



Source: Authors' elaboration with data from EDER 2017.

Although the proportion with no offspring for highly educated women is about twice that of low and middle educated women, this phenomenon has been increasing across generations, even for less-educated women. Having a single child is also more frequent among women with higher education, but the trend for women with medium and low levels of education has been consistently increasing, doubling between those born in 1964-1965 and 1974-1975.

Thus, the work accumulated so far enables us to account for the polarization of the reproductive phenomenon in the Mexican territory, expressed through markers as the increasing percentage of women with very small offspring in certain strata and regions, while in other groups and areas reproductive models related to old patterns persist, such as greater offspring or the preference for sons.

## **Methods**

This paper is based on the analysis of disparities in indicators of fertility intensity and timing, such as final offspring, probabilities of family enlargement, median ages at first union and first child, and childbearing intervals. To this end, sequence analysis techniques were used to classify the country into regions with different standards of family formation and to verify that the gaps and pace of trends also have a territorial component.

Sequence Analysis techniques are used to identify the most frequent order in which three types of events occur: sexual debut, births, and type and number of marital unions. In Mexico, it is common for marital and religious unions to occur simultaneously, but it is possible that they occur at different times and in different orders, or that neither occurs. Thus, the length of the sequences is a function of the formalization of the union by one or both of the forms, the simultaneity of the civil and religious unions, the number of successive unions, the cumulative number of children, and the declaration of the age of sexual debut, since this is a question that may or may not be answered.

The index of possible stages through which it is possible for women to move while shaping their families is conceptually defined in Table 1. The stages are listed following a logical order, although it is possible that some of them are not transited, or that the order followed does not correspond to this model. The only thing that is certain is the starting point since all women begin their trajectory single and without children. For example, about the beginning of sexual life (stage b), there is no information available for all women, because it is a question that is optional to answer. However, the greater or lesser response to this question is indicative of the extent of openness of these women and, possibly, of their cultural context.

**Table 1**

Index of possible stages (status or transitions)

Stage (status or transition)	Abbreviation
a. Single and childless	S
b. Sexual debut	SD
c. Cohabiting	Co
d. Religious and civil marriage	RCM
e. Religious marriage	RM
f. Civil marriage	CM
g. Subsequent marital union	M2+
h. First child	Ch1
i. Second child	Ch2
j. Third child	Ch3
k. Fourth child	Ch4
l. Fifth child	Ch5
m. Sixth child and subsequent	Ch6+

Source: Conceptually defined by the author.

In the case of the stages related to the type of first marital union (c, d, e, and f), we will find cases in which they go through all of them and in that direction, and cases in which there is no cohabitation, and they start with a religious marriage followed by civil marriage, among other possibilities. In Mexico, as in all societies, the form of entry into the first union is usually very relevant. As for the stage indicating the possibility of remarriage (stage g), it could occur before the birth of children or between any of those births. In fact, this transition might occur at various times in the trajectory (though always after the first union, regardless of its type). It is also possible that the birth of children precedes the conjugal union, or that someone goes directly to the stage of a second or third child if the first birth has been multiple.

The set of sequences followed by women born in each federal state already reveals the intra-national diversity, but the most predominant trajectories in each state are illustrative

of the flexibility or rigidity of the social standard. A measure of distance (optimal matching) between each individual sequence to a national sequence reference is then estimated, and the average distance for each state cluster is used to define regions formed by similar territories.

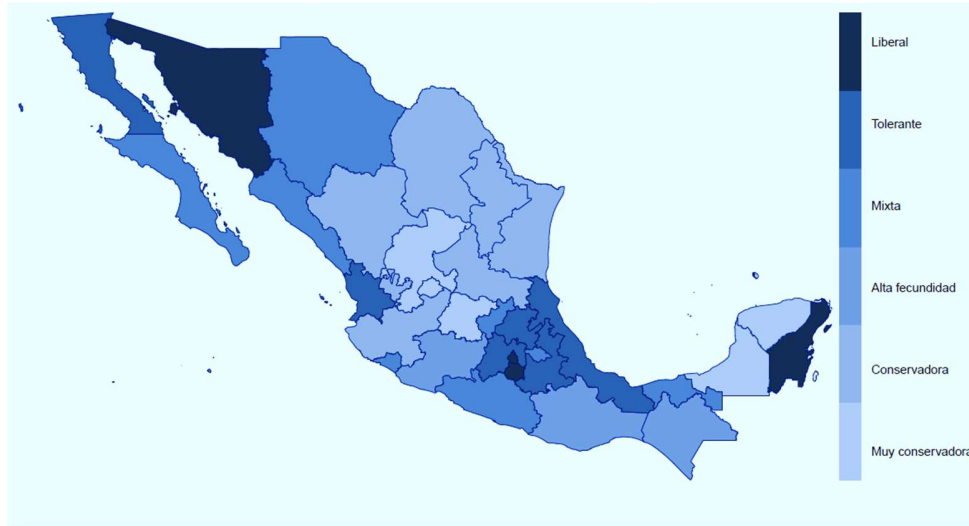
The regions are then used as variables to estimate their effect on the probability of having a third child, with discrete-time models. The confirmation of statistically significant differences for women born in distinct geographies constitutes proof of the relevance of this definition of conglomerates.

## **Results**

The sequence analysis carried out results in the delimitation of six regions with different standards of family formation (Figure 2). There are observable differences in the indicators of intensity and timing of fertility (Table 2). Women in the *High fertility* region have the highest average number of children at the end of their reproductive life (close to 3.6 children per woman). In the *Very Conservative* region, the average is 3.1 children and, in contrast, in the *Liberal* region, women average 2.1 children. This is a difference of 1.5 sons/daughters between opposite regions of the same country. In the *Very Conservative* region, reproduction starts one year later, on average, but the spacing between the second and third child is shorter compared to the *Mixed* and *Tolerant* regions. In the *Mixed* region, there is a higher probability of having a third child, especially if the first two were girls. In the *Tolerant* region, the gender of the first two children is not relevant in the probabilities of seeking a third child. In the *Liberal* region, we observe the lowest final offspring, the greatest postponement of the first birth, as well as the greatest spacing between first, second and third births. Also, the highest proportion of women with only one child and the highest proportion of women with no offspring. In general, lower probability of family enlargement, even if the first two children had been of the same sex.

**Figure 2**

Regions in Mexico based on family formation patterns



Liberal	Tolerant	Mixed	High fertility	Conservative	Very conservative
Ciudad de México	Baja California	Baja California Sur	Chiapas	Coahuila	Agascalientes
Morelos	Hidalgo	Colima	Michoacán	Durango	Campeche
Quintana Roo	México	Chihuahua	Oaxaca	Jalisco	Guanajuato
Sonora	Nayarit	Guerrero		Nuevo León	Yucatán
	Puebla	Querétaro		San Luis Potosí	Zacatecas
	Veracruz	Sinaloa		Tamaulipas	
		Tabasco			
		Tlaxcala			

Source: Authors' elaboration with data from EDER 2017.

**Table 2**

Fertility indicators by region

	Liberal	Tolerant	Mixed	High fertility	Conservative	Very conservative
Final number of children	2.1	2.8	3.0	3.6	2.8	3.1
Median age at first conyugal union	21	20	20	19	20	20
Median age at first children	22	21	21	20	21	22
Number of years between first and second children	5	4	4	3	4	4
Number of years between second and third children	8	6	6	4	5	5
Proportion of women with one child	0.14	0.11	0.11	0.07	0.07	0.09
Probability of having a third children if the two first are female	0.68	0.68	0.82	0.78	0.82	0.84

Source: Authors' elaboration with data from EDER 2017.

With indicators suggesting a slower transition are the *High Fertility* and *Very Conservative* regions. The first (Chiapas, Michoacán, Oaxaca) retains high offspring due to very early unions and short spacing between children, in addition to lower contraceptive use

during the reproductive life of couples. Meanwhile, the second adheres to the traditional reproductive model, with a predominantly civil and religious marriage, delayed birth of the first child and relatively short intervals between successive births, until reaching a large family size, since 57% of the women who had a third child have a fourth child and 52% of the women who had four children have a fifth child.

### **Final remarks**

The transition to a more delayed fertility calendar and a rate close to replacement fertility occurs in Mexico at varied paces, depending on determinants such as educational level, social origin, urban/rural context, and ethnicity. We have added to our understanding the territorial component as a cultural determinant and origin-variable that influences fertility and marital levels and timing. The place of birth is relevant in delineating the expected patterns of marital and reproductive behavior for women.

Hence, in some affluent regions, and medium-sized cities, we can find slower reproductive trends compared to what educational and economic levels would imply. The country is socially and culturally diverse and some regional standards of family formation are evident and very polarized. Fertility models range from high to low completed fertility and their association with explanatory variables of context, origin and life course is complex.

Given that family formation patterns are influenced by the different roles, gender norms and status of women in each region, we face new challenges and new opportunities for the theoretical development of the demographic transition, which would contemplate the intersectionality of the explanatory variables and the impact that these differentiated rhythms have on population projections.

In addition, the different demographic dynamics certainly have economic and social consequences for the groups that produce them, but they also constitute an aggregate dynamic with distributive effects on the population as a whole.



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