

**ARANA, Roxana**  
**Ph.D. candidate in Demography**

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**Education**

**2017 — Doctorate candidate in Demography** in University of Montreal, Department of Demography.

Research project: Fertility transitions in Mexico, 1930-1970-2015: the intersection of socio-economic, cultural, and family factors.

**2015-2016** Doctoral studies in Statistics at the University of Montreal, Department of Mathematics and Statistics.

**2008-2010** M.Sc. in Statistics at the Department of Statistics of El Colegio de Posgraduados, Mexico. Specialization in finance.

**1996-2000** Degree in Statistics at the National University of Agriculture (Chapingo).  
Specialization in economics, quality Control of processes and sampling methods.

**Work Experiences**

**Sept-Dec 2020** University of Montreal. Department of Demography, Teaching Auxiliary, course: "Histoire des populations".

**June 2019-** University of Montreal. Department of Demography, PRDH: SAS/R coding and revision of historical databases from the 1852-1911 Census of Canada.

**February 2007 - August 2015.** National University of Agriculture (Chapingo). Research and statistical assistant.

**2012-2015.** *Project: Probability sampling to recover microdata from the 1930 General Census of Population.* Chapingo and Sectoral Fund for Research of the National Council of Science and Technology (CONACYT) and the National Institute of Statistics and Geography (INEGI). Activities: research coordinator, sampling design, statistical analysis.

**May 2012-February 2014.** *Project. Evaluation of the National Program for the Conservation and Restoration of Forest Ecosystems (2011-2012).* Chapingo and the National Forestry Commission (CONAFOR). Activities: sampling design, design survey for information gathering and statistical analysis.

**May 2010 - Jan 2012.** *Project: Attitudes, practices, factors, and spaces where gender violence and sexist attitudes occur and are reproduced in an academic medium.* Chapingo, Sectoral Fund for Research of the Ministry of Education and the National Council of Science and Technology (SEP-CONACYT). Activities: sampling planner, implementation of tools to collect information in the field, statistical analysis, and coordinator of trainees.

**January 2012 - July 2012.** *Project: Evaluation of effectiveness and efficiency in planning, monitoring and budget allocation for gender equality programs.* Chapingo, Sectoral Fund for Research CONACYT and the National Women's Institute (INMUJERES). Activities: coordination of operational activities. Advisers and coordinator of trainees.

**February 2007.** *Project: Evaluation of the Program for the Productive Organization of Indigenous Women (POPMI) in the state of Chiapas.* Autonomous University of Chapingo and the National Commission for the Development of Indigenous Peoples. Activities: collection of information, and statistical analysis.

**Dec. 2000—January 2006.** PepsiCo Int. Frito-Lay Mexico. Sales business planner in the Strategic Sales Planning Department. I developed projects such as: Geographic Sales Potential and the development of Data Exploitation platforms for the use of large volumes of data (data mining).

## **Publications**

### **Articles**

Arana Ovalle, R.I., 2020 (accepted). The Demographic Transitions of Mexico (1930-1970-2015): Analysis of Socioeconomic and Cultural Factors, HAL, Paris, France.

Arana, Roxana, Dillon Lisa. 2019 (conference paper). Family support and fertility in Mexico: 1930. Presented at Kinship and Reproduction in Past Societies, Minnesota Population Center, Minneapolis (Minnesota), USA. [iussp.org/seminarprogramme](https://iussp.org/seminarprogramme)

Zamudio, F.J., Arana, R., Cosmes, W., Cortés, J., 2015. Análisis de los microdatos del censo de 1930: a 80 años del México posrevolucionario. Realidad, datos y espacio. Revista internacional de estadística y geografía 3, 24–43. <https://est.cmq.edu.mx>

Zamudio, F.J., Arana, R., Ramos, D.S., Villaseñor, J., Téllez, F., 2012. Una estrategia para portafolios con Fondos Cotizados / A Strategy for Exchange Traded Funds (ETF's) portfolios. Revista Española de Financiación y Contabilidad 41, 417–444. <https://www.jstor.org/stable/42782883>

Zamudio, F.J., Ayala, R., Arana, R., 2014. Mujeres y hombres: desigualdades de género en el contexto mexicano. Women and men: gender inequalities in the Mexican context. Estudios Sociales, 22.44 <https://doi.org/10.24836/es.v22i44.149>

Zamudio Sánchez, F., Arana OVALLE, R., Santibáñez-Cortés, J., 2016. Replanteamiento de la Estrategia 100x100 a partir de un Índice de Desarrollo Humano para Localidades. *Economía Sociedad Y Territorio*, (52), 697-726. <https://doi.org/10.22136/est0522016513>

Zamudio Sánchez, F.J., Andrade Barrera, M.A., Arana Ovalle, R.I., Alvarado Segura, A.A., 2017. Violencia de género sobre estudiantes universitarios(as). *Convergencia* 24, 133–157. <http://www.scielo.org.mx>

Zamudio Sánchez, F.J., Cosmes Martínez, W., Arana Ovalle, R.I., Andrade Barrera, M.A., Becerril González, G., Rodríguez Esparza, L.J., 2018. Una estratificación socioeconómica para comparar dos momentos de desarrollo en México 1930-2010. *Economía Sociedad y Territorio* 259–289. <https://doi.org/10.22136/est0982>

### **Books**

Zamudio, F.J., Andrade Barrera, M.A., Arana, R., 2017. Una visión al interior de la Universidad Autónoma Chapingo, in *Espacios y Fronteras de la violencia y el género*. El

Colegio de la Frontera Sur, San Cristóbal de las Casas, Chiapas, Méx., pp. 67–90.

<https://www.worldcat.org>

Zamudio, F., Arana, R. 2013 Estudio de la violencia de género: La otra cara de la Universidad Autónoma de Chapingo, México. ISBN : 9 786 071 203 045 et IFBN : 9 786 071 203 410 (eBook), Pags. 375. <http://demyc.chapingo.mx/apps/pubs>

### **Thesis Codirector**

Cosmes, Waldenia. 2015. Socioeconomic stratification with microdata from the 1930 General Census of Population.

Ayala, Germán. 2012. Analysis of gender violence at students' households.

Andrade, Marco. 2012. Gender violence among students at the Autonomous University of Chapingo. Construction of a qualitative-quantitative index of violence

Cruz, Francisco. 2012. Statistical analysis of violence against women in the workplace in the University of Chapingo.

Jiménez, Javier. 2012 Gender in Public Programs: A Quantitative Assessment.

### **Research groups**

2018–2020. Research Assistant in the Research Program in Historical Demography, Demography Department, University of Montreal. <https://www.prdh-igd.com/en/le-prdh>. This group is dedicated to reconstructing historical Canada-Quebec's population data.

2008–2020. Researcher in the project “Social Statistics” in the Department of Statistics, Mathematics and Informatics. Universidad Autónoma Chapingo. The Social Statistics group is formed by professors, students and professionals in Statistics, Economics, and Sociology. The works carried out by the group are journals, books, reports, research projects, technological developments, workshops, etc. Main research themes focus on issues of human development, gender, violence, education, and so on, [DEMyC](#).

### **Conferences**

**November 18th-20th, 2020.** The Demographic Transition if Mexico (1930-1970-2015). CIST2020—Population, Time, Territories. 5th CIST conference. Campus Condorcet, Paris, France.

**2019.** Family support and fertility in Mexico: 1930. Forum: International Seminar on Kinship and Reproduction in Past Societies, Minnesota Population Center and Department of History, University of Minnesota. <https://iussp.org/en/kinship>

**2015.** Sampling for computerized population register of Microdata from the 1930 Census of Population, México D.F. in Forum: Results of research projects funded by the Research Fund of the National Council for Science and Technology and the National Institute of Statistics, Mexico, DF.

**2013.** Probability sampling for retrieving census microdata for the 1930 population census. Cartel. XXVII National Forum of Statistics. National Institute of Statistics and the Mexican Association of Statistics. Aguascalientes, Mexico.

**2007.** Use of Data Mining in marketing. Forum of scientific diffusion of the Autonomous University Chapingo, Mexico.

### **Courses-Workshops**

**2010–2011.** Application of small area estimation techniques in the social sciences. National Institute of Statistics and Geography (INEGI), Mexico City, DF.

**2011.** 2010 Census of Population and Dwellings. Microdata manipulation. National Institute of Statistics and Geography (INEGI), Mexico.

**2011–2012.** University Seminar on Gender Violence. Workshops: Violence in love relationships, costs of violence, legal framework of violence, violence in the University of, gender violence.

**2001–2006.** Diverse training courses in the use of specialized software in statistics, market research and data processing. Examples: Market Segmentation, Strategic Planning and Prospecting, Marketing Surveys and Information Analysis, Productive Communication, SPSS, SAS Advanced Course, etc.

### **Volunteer Participation**

**Feb. 2018 — Sept 2019.** Leader of the Association of Graduate Students in Demography, University of Montreal.

**July 1996—August 1998.** Coordinator of the university communication system, University of Chapingo.

**July 1999—August 2000.** Leader of undergraduate students in statistics. University of Chapingo

### **Software**

SAS, R, SPSS, Project Management, Office (Word, Excel, Power Point).

### **Languages**

Spanish, French and English.

## **Research project**

### **Fertility transitions in Mexico, 1930-1970-2015: the intersection of socioeconomic, cultural, and family factors.**

One process that exemplifies the late development of Mexican society is that of the demographic transition, which under the classic model of (Notestein 1945), goes hand in hand with industrialization and modernization. In other words, the shift from the agricultural to the industrial production model and the improvements in health bring a decrease in the mortality rate and subsequently a decrease in the fertility rate. According to Notestein, once society has an appropriate socioeconomic environment, and when individuals have the motivations of a modern individualistic culture, they will control their fertility with the aim of improving their standard of living.

My research shows the influence of rurality, indignity, socioeconomic status (SES), and geographic location on the decline of fertility among Mexican women at three times (1930, 1970, and 2015). We conclude that the SES is inversely related to fertility, that the rural-indigenous population has been decimated due to poor socioeconomic conditions, and that the non-indigenous-urban population is the one that best fits the classic model of demographic transition (Arana Ovalle, 2020).

On the other hand, several researchers (Smith et Brown 2018 ; Fu 2008 ; CEPAL 2008 ; Parrado et Morgan 2008b) largely analyzed the family structure in Mexico, focusing on the early fertility and growth of single mothers. However, the influence of the grandmother and mother-in-law on fertility has not yet been studied. My research proposes to analyze household structures over time and determine if there is a relationship between the presence of the mother or mother-in-law at home with the number of children in the family and what have been the changes in each stage of the demographic transition.

#### **Data**

Most studies of the demographic transition in Mexico have been conducted with disaggregated information from dates after 1960, since microdata from the Mexican census of 1930 did not exist. However, thanks to the recovery of a sample of the microdata by the National Institute of Statistics of Mexico (Zamudio et al., 2015) and the new tools to analyze large databases, it is possible to carry out this work. Then, for 1930 we used an 11% microdata sample with 207,747 women aged 15–49. For the year 1970 we analyzed a 1% microdata sample from the national census and for 2015 we analyzed a 9.5% microdata sample from the intercensal survey. The information for 1970 and 2015 comes from the International IPUMS project (Minnesota Population Center, 2018), where we download the information about 72,786 for 1970 and 2,042,383 women aged 15–49 for 2015. Analyzing historical microdata always presents a challenge, even more so when dealing with underdeveloped countries. To overcome the loss of information, we carry out different statistical analyses (descriptive, Poisson's regression, spatial and stratify analysis that arrive at the same conclusions (sensitivity analysis).

#### **Software**

Given my statistical background and the work I have done over few years, I am able to handle large databases and perform statistical analysis in R, SAS and SPSS.

#### **References**

- Arana Ovalle, R. I. (2020). *The Demographic Transitions of Mexico (1930-1970-2015): Analysis of Socioeconomic and Cultural Factors*. Population, temps, territoires, 5e colloque international du CIST, Paris, France.
- CEPAL. (2008). *Familia y solidaridad intergeneracional escenarios futuros en políticas de vejez en Panamá*.
- Fu, V. K. (2008). Interracial-Interethnic Unions and Fertility in the United States. *Journal of Marriage and Family*, 70(3), 783–795. <https://doi.org/10.1111/j.1741-3737.2008.00521.x>
- Minnesota Population Center. (2018). *Integrated Public Use Microdata Series, International: Version 7.1 [Mexico 1970, 2015]*. IPUMS. <https://doi.org/10.18128/D020.V7.2>
- Notestein, F. (1945). Population- The long view. In *Food for the world* (pp. 36–57). University of Chicago Press.
- Parrado, E. A., & Morgan, S. P. (2008). Intergenerational fertility among hispanic women: New evidence of immigrant assimilation. *Demography*, 45(3), 651–671. <https://doi.org/10.1353/dem.0.0023>
- Smith, C. D., & Brown, S. K. (2018). The fertility integration of Mexican-Americans across generations: Confronting the problem of the ‘third’ generation. *Journal of Ethnic and Migration Studies*, 0(0), 1–19. <https://doi.org/10.1080/1369183X.2018.1435263>
- Zamudio, F. J., Arana, R., Cosmes, W., & Cortés, J. (2015). Análisis de los microdatos del censo de 1930: A 80 años del México posrevolucionario. *Realidad, datos y espacio. Revista internacional de estadística y geografía*, 3, 24–43.