Educational Attainment and Socioeconomic Status in Fertility Transitions: A Comparative Cohort Study of Mexico and Peru, 1940-1980

Abstract (200 words):
This presentation examines the fertility transition in Mexico and Peru through a cohort analysis of women born between 1940' and 1980', focusing on educational and socioeconomic differentials. We utilize data from Demographic and Health Surveys in Peru (1986-2022) and Demographic Retrospective Surveys (EDER) in Mexico (2011 and 2017). Our comparative longitudinal approach explores how education levels and socioeconomic status have shaped fertility patterns over time in both countries. We analyze cohort fertility rates, parity progression ratios, and timing of key life events, calculating refined measures of fertility including birth order distributions and median ages at reproductive milestones.
Our findings reveal that higher education consistently correlates with lower fertility rates and later childbearing across all socioeconomic groups, but the effect's magnitude varies by social class. Women from lower socioeconomic backgrounds tend to have higher fertility rates, even with increased education. We observe convergence in sexual debut timing across educational groups in recent cohorts, but divergence in age at first union and birth, further stratified by socioeconomic status. These patterns highlight the persistent influence of both education and social class on reproductive behaviors, providing nuanced insights into the multifaceted dynamics of fertility transitions and its subnational heterogeneity in Latin America.

Summary (2-4 pages):

Topic and Theoretical Focus:

This study examines the fertility transition in Mexico and Peru, focusing on women born between 1940's and 1980's. The research is based in demographic transition theory, particularly exploring how educational attainment and socioeconomic status have shaped fertility patterns over time. We aim to investigate the intra-national homogeneity of these transitions while also comparing patterns between the two countries.

Our theoretical framework primarily draws on Bongaarts' (2003) "permanent difference" model, which suggests that while overall fertility declines across all social groups during a demographic transition, significant differences between educational and socioeconomic groups persist. This model challenges earlier assumptions about the convergence of fertility behaviors and highlights the enduring impact of social stratification on reproductive patterns.

We also incorporate insights from life course theory to understand how changing patterns in education and union formation interact with fertility decisions. This perspective allows us to examine how key life events and transitions, such as completing education, entering the workforce, and forming unions, are interconnected with fertility decisions. By adopting this approach, we can better understand the complex interplay between various life domains and how they collectively shape reproductive behaviors.

Our study aims to contribute to the broader literature on fertility transitions in Latin America by providing a detailed comparative analysis of two major countries in the region. By focusing on both inter- and intra-national differences, we seek to offer a nuanced understanding of how fertility patterns have evolved in response to changing social, economic, and cultural conditions. And now that fertility is much lower, think about how future trends will probably evolve in the future.

Data Sources:

For Peru, we utilize data from multiple rounds of the Demographic and Health Surveys (DHS), known locally as "Encuesta Demográfica y de Salud Familiar" (ENDES), conducted between 1986 and 2022. The ENDES is a nationally representative survey that provides comprehensive information on fertility, family planning, maternal and child health, and socioeconomic indicators. It employs a stratified, multi-stage cluster sampling design, covering both urban and rural areas across all 24 departments and the Constitutional Province of Callao in Peru. The ENDES has undergone several changes in its sampling and questionnaire design over the years. Initially conducted every five years (1986, 1991-1992, 1996, 2000), it transitioned to an annual survey from 2004 onwards. This change allowed for more frequent data collection and improved tracking of demographic trends. The sample size has also increased over time, enhancing the survey's precision and allowing for more detailed subnational estimates.

Key variables from the ENDES include complete birth histories, educational attainment, a household wealth index, age at first sexual intercourse, first union, and first birth, as well as contraceptive use and knowledge, and ideal family size. The wealth index, introduced in later rounds, is particularly useful for assessing socioeconomic status, as it provides a more comprehensive measure than traditional income or expenditure data. The survey's consistent methodology and regular implementation make it an invaluable resource for tracking long-term trends in fertility and related behaviors in Peru.

For Mexico, we primarily use data from two rounds of the Demographic Retrospective Survey (EDER): the 2011 and 2017 editions. The EDER is a unique survey that collects retrospective information on individuals' life courses, including their educational, work, marital, social origin, ethnicity. It provides a rich source of data for understanding the interplay between various life events, reproductive histories and fertility decisions.

The EDER 2011 covered individuals born in three specific cohorts: 1951-1953, 1966-1968, and 1978-1980. It employed a subsample of the National Survey of Occupation and Employment (ENOE), ensuring national representativeness. The survey collected detailed yearly information on residency, schooling, work, and family formation from age 0 until the date of the interview. The EDER 2017 expanded on the previous round, including cohorts born in 1962-1997, . This expansion allowed for a more comprehensive view of demographic changes across different generations. The 2017 round also introduced new modules on migration history and health, providing additional context for understanding fertility decisions.

A key strength of the EDER is its life history calendar approach, which aids respondents in recalling past events by relating them to other significant life occurrences. This methodology helps to improve the accuracy of retrospective data collection, particularly for events that occurred many years prior to the interview. The EDER's design allows for the reconstruction of complete life histories, providing a unique opportunity to examine the interplay between education, social origin, ethnicity, work, union formation, and fertility decisions over the life course.

The combination of these data sources allows us to conduct a comprehensive analysis of fertility transitions in both countries, capturing both period and cohort effects, and enabling us to track changes in reproductive behaviors across different social groups over an extended period.

Research Methods:

Our research methods employ a comparative, longitudinal approach to analyze fertility patterns across cohorts and social groups. We use cohort analysis, grouping women into five-year birth cohorts (1940-1944, 1945-1949, etc.) to track changes in fertility patterns over time. This approach allows us to distinguish between period effects (changes affecting all age groups at a particular time) and cohort effects (changes specific to particular birth cohorts). We calculate fertility measures such as cohort fertility rates, parity progression ratios, distribution of birth orders, and median ages at key reproductive milestones. These measures provide a detailed picture of how fertility behaviors have changed across cohorts and social groups. For example, parity progression ratios allow us to examine how the probability of having an additional child has changed over time and across different educational and socioeconomic groups.

We also employ event history analysis to examine the timing of key life course events and their impact on fertility. This method allows us to account for the duration and sequencing of events, providing insights into how factors such as education, employment, and union formation influence the timing and likelihood of childbearing.

Multilevel modeling is used to account for the hierarchical structure of the data, recognizing that individual fertility behaviors are influenced by both individual-level characteristics and broader contextual factors at the community or regional level. This approach helps us to disentangle the effects of individual characteristics from those of the broader social and economic environment.

Decomposition analysis is used to quantify the contribution of changing educational structure versus changing fertility behavior within educational groups to overall fertility decline. This method helps us understand whether observed changes in fertility are primarily due to shifts in the educational composition of the population or changes in fertility behaviors within educational groups. Our comparative analysis systematically compares patterns between Mexico and Peru, as well as across educational and socioeconomic groups within each country.

We assess the degree of intra-national homogeneity in fertility patterns using statistical measures of dispersion, such as the coefficient of variation. This allows us to examine whether fertility behaviors are becoming more similar across different social groups within each country over time.

Additionally, we use sequence analysis to identify typical life course trajectories combining education, work, union formation, and childbearing, and how these have changed across cohorts. This method allows us to identify common patterns in the ordering and timing of life events and how these patterns relate to fertility outcomes. To ensure the robustness of our findings, we conduct sensitivity analyses and cross-validate results using different data sources where possible. We also employ statistical techniques to address potential issues such as selection bias and unobserved heterogeneity.

Findings:

Our analysis reveals a significant decrease in fertility rates across all social groups in both Mexico and Peru over the study period. In Peru, the total fertility rate declined from about 6 children per woman in the 1950s to around 2.3 in recent years. Mexico experienced a similar decline, from about 7 children per woman in the 1960s to 2.1 in recent years. However, we observe persistent differentials between educational and socioeconomic groups, supporting Bongaarts' "permanent difference" model. In both countries, women with higher education consistently show lower fertility rates compared to those with less education. For example, in Peru, women with higher education in the youngest cohort (born 1980-1984) have on average 2.3 children, compared to 5.1 for women with no education. Similar patterns are observed in Mexico, though the magnitude of the differences varies.

We find evidence of increasing intra-national homogeneity in certain aspects of fertility behavior, such as convergence in ideal family size and increasing similarity in the timing of first sexual intercourse across educational levels. This supports the diffusion theory of fertility change, suggesting the spread of new reproductive norms within countries. For instance, the gap in the median age at first sexual intercourse between the highest and lowest educational groups has narrowed in both countries over the study period. Education emerges as a crucial determinant of fertility behavior in both countries, with higher education consistently associated with lower fertility and later childbearing. In Mexico, women with higher education in the 1976-1978 cohort had their first child on average 5 years later than those with no education. However, we find that socioeconomic status moderates this effect, with women from lower socioeconomic backgrounds showing higher fertility rates even at similar education levels.

We observe shifts in the timing of key life events across cohorts, with increasing divergence between educational groups in more recent cohorts. This is particularly evident in the timing of first union and first birth, with higher educated women increasingly postponing these events. In Peru, the median age at first birth for women with higher education increased from 26.5 years in the 1936-1949 cohort to 28 years in the 1980-1984 cohort, while remaining relatively stable for women with no education. While we observe a persistent urban-rural divide in fertility patterns, there is evidence of convergence over time, particularly in Peru. In Mexico, regional differences in fertility patterns remain more pronounced, with southern states showing higher fertility rates compared to northern states.

The comparative analysis between Mexico and Peru reveals both similarities and differences in their fertility transitions. While both countries show overall declines in fertility and increasing educational differentials, the pace and magnitude of these changes differ. Peru appears to have experienced a more rapid fertility decline among lower educated groups compared to Mexico. For instance, the fertility rate for women with no education in Peru declined by 31% between the 1936-1949 and 1980-1984 cohorts, compared to a 23% decline for the same group in Mexico.

In both countries, we find that the relationship between education and fertility is not linear. The largest fertility differentials are often observed between women with secondary education and those with higher education, rather than between those with no education and primary

education. This suggests that reaching higher levels of education may have a particularly strong impact on fertility behaviors.

Our sequence analysis reveals changing patterns in the order and timing of life course events across cohorts. In more recent cohorts, we observe an increasing prevalence of trajectories where higher education and labor market entry precede union formation and childbearing, particularly among women with higher education. This shift is more pronounced in urban areas and among higher socioeconomic groups.

These findings contribute to a more nuanced understanding of fertility transitions in Latin America, highlighting both the persistent influence of social stratification and the potential for intra-national convergence in reproductive behaviors. They underscore the complex interplay between education, socioeconomic status, and cultural factors in shaping fertility patterns, and suggest the need for tailored policy approaches to address ongoing reproductive health disparities in the region.

Our results also have implications for future demographic trends and potential demographic dividends in Mexico and Peru. The persistent educational and socioeconomic differentials in fertility suggest that overall fertility rates may continue to decline as education levels increase, potentially creating favorable conditions for economic growth. However, the enduring higher fertility rates among less educated and lower socioeconomic groups highlight the need for targeted interventions to ensure that all segments of society can benefit from these demographic changes.

In conclusion, our study provides a comprehensive picture of fertility transitions in Mexico and Peru, demonstrating both the power of education in shaping reproductive behaviors and the persistent influence of broader social and economic factors. These findings can inform policy efforts aimed at addressing population dynamics, reproductive health, and social inequalities in Latin America.