

## The evolution of the socioeconomic gap in fertility among adolescents in Chile, 1990-2011

La evolución del diferencial socioeconómico en fecundidad entre los adolescentes en Chile, 1990-2011

A evolução do diferencial socioeconômico na fecundidade de adolescentes no Chile, 1990-2011

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### Abstract

*For research and policy issues, it is very important to measure the evolution of socioeconomic differences in the adolescent fertility rate over time (AFER) in order to be able to provide a quantitative description of such an evolution. By combining well reputed Chilean data, this study computes a ratio of AFER (15-17 years-old) between the 30% of the population living in economically worst off areas (the numerator) against the corresponding 30% better off segment of the population (the denominator). This ratio of AFER by relative socioeconomic status shows a stable evolution from 1.45 in the year 1990 to 1.10 in 2011. Sexual initiation, whose association with AFER is well established, also shows a dropping ratio, from 1.24 in 1997 to 1.01 in 2012. The size of some dimensions of socioeconomic inequalities in adolescent fertility and sexual initiation has been decreasing between 1990 and 2011. This exercise shows that even in Chile, the most unequal country among the Organisation for Economic Co-operation and Development, there are some improvements in health inequality.*

*Fertility; Sexual Behavior; Adolescent*

### Resumen

*Debido a complicaciones metodológicas y políticas es muy importante mensurar la evolución de las diferencias socioeconómicas en las tasas de fecundidad adolescente (AFER), con el fin de ser capaz de proporcionar una descripción cuantitativa de tal evolución. Combinando datos chilenos de buena calidad, este estudio computa una razón de AFER (15-17 años) entre el 30% de la población que reside en áreas de menor nivel socioeconómico (numerador) versus el correspondiente 30% en áreas de mayor nivel (denominador), entre 1990 y 2011. La razón de AFER por nivel socioeconómico muestra una evolución estable desde 1,45 en 1990 a 1,10 en el año 2011. La iniciación sexual, cuya asociación con AFER es conocida, también muestra una razón decreciente, desde 1,24 en 1997 a 1,01 en 2012. El tamaño de algunas dimensiones de las desigualdades socioeconómicas en la fecundidad adolescente y la iniciación sexual disminuyó entre 1990 y 2011. Este ejercicio muestra que incluso en Chile, el país más desigual en la Organización para la Cooperación y el Desarrollo Económicos, hay claras mejoras en algunas dimensiones de la desigualdad en Salud.*

*Fertilidad; Conducta Sexual; Adolescente*

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## Background

The adolescent fertility rate (AFER) is a key dimensions of adolescents' reproductive health, and is usually linked to socioeconomic status (SES).

But only a few studies follow the evolution of inequality in adolescent fertility across time, and they use follow-up data that is not available in most countries, and use absolute rather than relative measures of SES.

Absolute measures, such as education level and race, are likely to change their "prevalence" across time<sup>1</sup> and are not standard measures across countries, jeopardizing the comparison of health outcomes. A relative measure, like the rank-position of the observation in a socioeconomic ladder, can be compared across time and places.

This study quantitatively describes the evolution of AFER by SES, and, to support the findings, the evolution of adolescents' sexual initiation (ASEX) by SES is also included. AFERs and ASEX are closely related. ASEX is usually regarded as a proximate determinate of AFER<sup>2</sup>. In developed countries, AFERs are probably the only fertility rates where sex plays a major role. Indeed, the median age at sexual initiation has decreased in recent decades in Chile<sup>3</sup>, while AFERs have remained stable or even increased<sup>4,5</sup>.

This study aims to describe quantitatively the evolution of the relative-SES ratio of adolescent (15-17 years old) fertility rates and sexual initiation in Chile on each year between and 1990-2011 or 1997-2012, respectively.

## Methods

AFERs by SES are difficult to measure. AFERs are small (less than 4% of 15-17 year old women have a child in any recent given year in Chile<sup>5</sup>), so either large surveys or vital records are required to estimate them. However, large surveys are costly and vital records usually do not include rich socioeconomic information, aside from a few variables regarding parents' education and employment status. Measuring adolescents' SES requires somewhat complex socioeconomic data<sup>6</sup>. However, if the vital records include complete data on place of residence, a geographic SES can be computed and used to compare across time and countries, in a relatively easy manner, the ratio of AFERs (or another health measure) between the X% of the population living in the lowest and highest income areas.

Chilean comunas, a very important territorial and administrative unit, are used here as

geographic and socioeconomic areas. Comunas are very heterogeneous, ranging from isolated and unpopulated areas to metropolitan areas with over 400,000 individuals each. The socioeconomic comuna-level data is estimated using data from the *Encuesta de Caracterización Socioeconómica Nacional* (CASEN). CASEN is by far the largest and most influential socioeconomic survey in Chile, and it uses comunas as a second-level sampling unit. There are roughly 350 comunas in Chile, around two thirds of them included in the CASEN sample. Two groups are defined in this study, by sorting the average household per-capita-wage in each comuna and then forming two groups of comunas: a high and a low relative SES group. Comunas in between the two groups are not included in the analysis. Each year from 1990 to 2011 that CASEN is conducted, the grouping is carried out so that the percentage of females aged 15-17 in each group is as close as possible to 30% (it ranges between 28% and 31%). The 30% percent rule is chosen as an equilibrium between the size of each group and the size of the difference in AFER. AFER by SES is defined then as single-year live births over mid-year population among 15-17 year old females. Results are similar if a 15-19 age range is used instead. Deliveries by SES are taken from Chile's official micro data (missing data is estimated to be under 5% since 1990 and about 1% since 2004), which includes the comuna where the mother lives. Total population by SES is taken from official comuna-level estimations, and the percentage of the population who is a 15-17 year old female is taken from the CASEN survey.

Regarding ASEX, the data used in this study comes from a completely different source. The Chilean National Youth Survey (*Encuesta Nacional de la Juventud – ENJuv*) is the primary survey for youth issues in Chile, with seven rounds conducted from 1994 to 2012. ENJuv had a sampling error of 1.1% and 3% in urban and rural areas, respectively, in 2012. The ASEX in this study is operationalized by the "proportion that has ever had sex" among 15-17 year old adolescents, as the survey collected data every third year starting in 1994. Due to sample sizes, male and females are pulled together. Comunas on ENJuv 1997 and 2000 are blind-coded, therefore a new exercise of ranking and grouping comunas is required. By choosing among the few household-level economic variables in ENJuv, relative SES is obtained by hierarchically sorting comunas by their "proportion of interviewed population that report having a household head with a professional occupation (i.e. managerial-level employees or at least four years of university education)". Another option was the "socioeco-

conomic level” variable, as included in ENJuv, but this variable changes substantially from round to round and is not clearly defined in the methodological documents of the survey. Results, nevertheless, are not very sensitive to these options, even if individual-based rather than geographical-based SES are used. The grouping is done so the percentages of the population living in either the higher or lower SES are as close to 30% as possible.

## Results

The AFER goes from 0.037 to 0.043 births per person-year, between 1990 and 1997 (Table 1), and then goes down to 0.037 in 2011. The ratio of AFER by SES, on the other hand, decreased from 1.45 in 1990 to 1.10 in 2011 (Figure 1). In other words, in 1990 and 2011 the adolescent fertility rate appears to be around 45% and 10% higher, respectively, amongst the 30% of the population that lives in lower SES areas, as compared to the 30% that lives in higher ones. Moreover, the absolute gap between them also dropped from nearly 0.014 births per person-year in 1990 to 0.004 in 2011.

ASEX rises from 20% to 39% between 1997 and 2012 (Table 1). The ratio of ASEX by relative SES among adolescents aged 15-17 dropped

from 1.24 to 1.01 between 1997 and 2012 (Figure 1). The absolute gap in sexual initiation also dropped, from 6 percentage points in 1997 to around zero in 2012.

At the same time, the relative household per-capita wage between the highest and lowest SES areas remained at 2.5 (approximately) from 1990 to 2011. Therefore it is probably not a mere closing gap in SES itself that is explaining the closing SES gap in AFER.

## Conclusions

The size of some dimensions of socioeconomic inequalities in adolescent fertility and sexual initiation have decreased between 1990 and 2011. This exercise shows that even in Chile, the most unequal country among the Organisation for Economic Co-operation and Development (OECD) <sup>7</sup>, there are clear improvements in some dimensions of health inequality.

This evidence is consistent with a study by Comisión Económica para América Latina y el Caribe (CEPAL) <sup>8</sup>, where the comparative low demographic inequality (including adolescent fertility) in Chile is emphasized, among a group of seven Latin-American countries. Is also consistent with evidence regarding a closing gap in infant mortality in Chile (CEPAL <sup>9</sup> compares urban

Table 1

Levels of female adolescent (15-17 years-old) fertility rate (AFER) and sexual initiation (ASEX), and their low-to-high ratios by socioeconomic status (SES), 1990 to 2011.

Year *	AFER ** (per 1,000)	ASEX *** (sample size)	ASEX (%)	AFER/SES ratio	ASEX/SES ratio
1990	37			1.45	
1992	38			1.49	
1994	40			1.58	
1996	40			1.36	
1997/1998	43	666	20	1.38	1.24
2000	41	540	28	1.43	1.18
2003	35	1,216	25	1.26	1.10
2006	33	1,215	27	1.32	1.14
2009	38	1,429	37	1.05	1.06
2011/2012	37	1,350	39	1.10	1.01

Source: author's calculations.

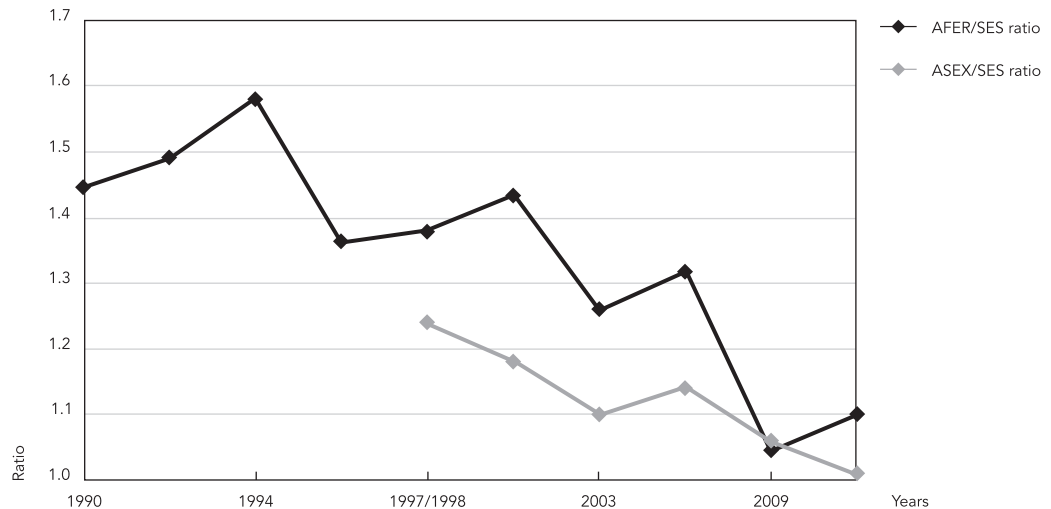
\* For AFER, 1997 and 2011 are the valid years; for ASEX, 1998 and 2012;

\*\* AFER: the adolescent fertility rate is defined as the single-year number of births by 15-17 year olds females over the total estimated mid-year female population of 15-17 year old. As estimates of AFER come from vital records, official estimates and *Encuesta de Caracterización Socioeconómica Nacional* (CASEN) survey data, only years where a CASEN survey was collected are included in the table;

\*\*\* ASEX: the “proportion that has ever had sex” among 15-17 year old adolescents is read from the *Chilean National Youth Survey*, which collected data every third year starting in 1994.

Figure 1

Ratio of female adolescent (15-17 years-old) fertility rate (AFER) and sexual initiation (ASEX) between the 30% of the population that lives in the socioeconomically better off areas against the corresponding 30% in the worse off ones, 1990 to 2011.



Source: author's calculations.

AFER: relative socioeconomic status (SES) is computed for all comunas included in CASEN (between 70% and 90% of total comunas in Chile, comprising the majority of the Chilean population), by ranking their average household-per-capita wage. ASEX: Relative SES is obtained by hierarchically sorting comunas by the "proportion of interviewed population that report having a household head with a professional occupation". For AFER, 1997 and 2011 are the valid years; for ASEX, 1998 and 2012.

and rural areas; Castro <sup>10</sup> compares geographic relative SES).

Two general comments that are worth mentioning. First, greater attention of reproductive health programs to adolescents of higher relative socioeconomic level is necessary. Further exploration of the data shows that in higher socioeconomic areas ASEX decreased and AFER remained constant. Second, amidst a lack of standard population-level measures <sup>11</sup>, opposite socioeconomic groups of equal relative size

provides an opportunity for internationally and inter-temporally comparable studies.

Within the limitation of this study, it is important to highlight that selection effects might distort the results if, for example, adolescents that are less inclined to early reproductive lives are moving out of poverty across time. It is also important to mention that measuring SES by residential-area leaves out individual-level dimensions of SES that are relevant for the study of socioeconomic health inequalities.

## Resumo

*Devido a questões de pesquisa e política, é muito importante medir a evolução das diferenças socioeconômicas da fertilidade das adolescentes (AFER) ao longo do tempo. O objetivo foi prover uma descrição quantitativa da evolução das desigualdades socioeconômicas nas diferenças socioeconômicas da fertilidade das adolescentes. Combinado dados chilenos de boa qualidade, este estudo calculou a razão de AFER das adolescentes (15-17 anos) entre os 30% da população de áreas mais pobres economicamente (numerador) com os 30% da população de áreas mais ricas (denominador). A razão de AFER das adolescentes por condição socioeconômica apresenta uma estabilidade na evolução: de 1,45 em 1999 para 1,10 em 2011. A razão da iniciação sexual também mostra uma queda: de 1,24 em 1997 para 1,01 em 2012. A magnitude de algumas das dimensões das desigualdades socioeconômicas em relação à fertilidade e à iniciação sexual das adolescentes tem apresentado queda entre 1990 a 2011. Este exercício mostra que, no Chile, um dos países mais desiguais entre os membros da Organização para a Cooperação e Desenvolvimento Econômico, existem algumas melhoras nas desigualdades em relação à saúde.*

*Fertilidade; Comportamento Sexual; Adolescente*

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