

FERTILITY LEVELS AND DIFFERENTIALS IN ARGENTINA IN THE NINETEENTH CENTURY

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The purpose of this paper is to estimate the level of fertility in Argentina around 1895, and to assess the existence of fertility differentials.

During the period between the first and third Argentine censuses, i.e., 1869 and 1914, covering almost half a century, the population increased extraordinarily. In fact, not only the population, but the country as a whole developed vigorously. Table 1 presents some sociodemographic indices showing the expansion. It seems unnecessary to comment on the indices; they are self explanatory.

The high rate of demographic increase was the result of two equally important factors: a massive immigration from Europe and a high rate of natural increase resulting from the combination of a high fertility level with a level of mortality that, though relatively high, was decreasing.

For the study of the development of the population in Argentina in that period it is important to establish, as far as the demographic analysis and the quality of the information permits, the level of fertility. Moreover, in view of the fact that fertility in Argentina declined sharply during the twentieth century—following a trend parallel to that of those countries with predominantly European population—it is interesting to investigate whether or not fertility differentials occurred about 1895 that could have permitted one to anticipate the decline that was about to start or was already in action.

BASIC INFORMATION

Data available for a demographic study of the population in Argentina around 1895 are scanty and poor in quality. First is the published results of the First, (1869) and Second (1895) National Population Censuses.^{1,2} A serious shortcoming of this information is that, in addition to the frequent omissions and inaccuracies of data, the tabulation of the results is deficient, and the lack of cross classifications by age is particularly regrettable. A remarkable merit of the 1895 census is that it included two questions aimed at investigating fertility: one on the number of children ever borne and another on the number of years of married life. Both were asked of women who declared themselves to be either married or widowed at the time of the census. Such questions were advanced ideas for the time and the commentator of the 1914 census stated proudly: "The Argentine National Census of 1895 was at the time the most complete ever taken in civilized countries because of the investigation that it carried out on the fertility of married and widowed women."³ In the present paper, some of the published results of the 1895 census are used—those providing information on the population classified by sex, nativity and age.

The *vital statistics* of 1895 were too deficient and inadequate to be used in demographic analysis. They are of no use at the national level, though they can be elaborated in the case of the city of Buenos Aires (where the omissions were probably unimportant), to determine fertility and mortality rates by sex and age. The fact that they do not distinguish between resident and nonresident population, however, is a serious shortcoming, since the deaths of nonresidents might exaggerate the resulting mortality level. Vital statistics are not employed here to derive the estimate of fertility although they were taken into account, as stated above, to compute age-specific fertility rates and mortality tables for Buenos Aires. These results, probably not representative of the fertility and mortality of the country as a whole, were useful for making comparisons with the national estimates.

The *Provincial Census of Santa Fe* (1887),⁴ and the *Municipal Census of Buenos Aires* (1887),⁵ also provided interesting results on fertility that were useful for judging the adequacy of the estimate of national fertility.

Data on *international migration*, of relevant importance at the time, are also very deficient and poor. They were used only to judge the acceptability of the rate of natural increase for the intercensal period.^{6,7}

Finally, the main sources of information on which this paper is

based are the samples of the original census schedules of 1869 and 1895. These samples were elaborated by the Centro de Investigaciones Sociales of the Instituto Torcuato Di Tella, Buenos Aires, with the financial support of the Population Council of New York. The samples, including 100,944 and 108,672 people, enumerated in 1869 and 1895, respectively, were drawn during the second half of 1966 and the beginning of 1967. The first set of tables prepared on that basis, some of them used in this paper, was finished by April and May 1967. The quality of the census material, of course, cannot be improved in the samples; what the samples provide is the possibility of preparing tabulations, cross-classifying data, especially adequate for the analysis.⁸

Summing up: this paper is based mainly on the results of the Second National Population Census (1895)—the published results and the recently drawn sample. Other information is also taken into account: the First National Population Census (1869), the *Provincial Census of Santa Fe* (1887), the *Municipal Census of Buenos Aires* (1887), data on international migration and even some information from the 1914 National Census.

THE LEVEL OF FERTILITY BEFORE 1895

This is not the first attempt to estimate the fertility of the population of Argentina in the years around 1895. As early as 1904, Francisco Latzina⁹ estimated the crude birth rate for 1900 to be 38.5 per thousand on the basis of birth registrations, making some assumptions on omissions affecting them. More recently, Davis¹⁰ and Collver¹¹ elaborated estimates of the birth rate of Argentina from 1860 to 1960. The rate they estimated for the quinquennium 1890-1894 is 42.9 per thousand. They also assume that during that period, and from 1860-1864 onward, a decrease in the birth rate had taken place. These estimates are based on the results of the Argentinian censuses combined with assumptions on mortality.

This paper is original inasmuch as it makes use for the first time of 1895 census data on number of children borne by women, married or widowed, broken down by age. This allows one, following the procedure developed by Mortara,¹² to estimate annual fertility rates by age and the gross reproduction rate.

In elaborating the estimate of the level of fertility two different independent procedures are used. The first one is based on the previously mentioned data on children ever borne by women enumerated

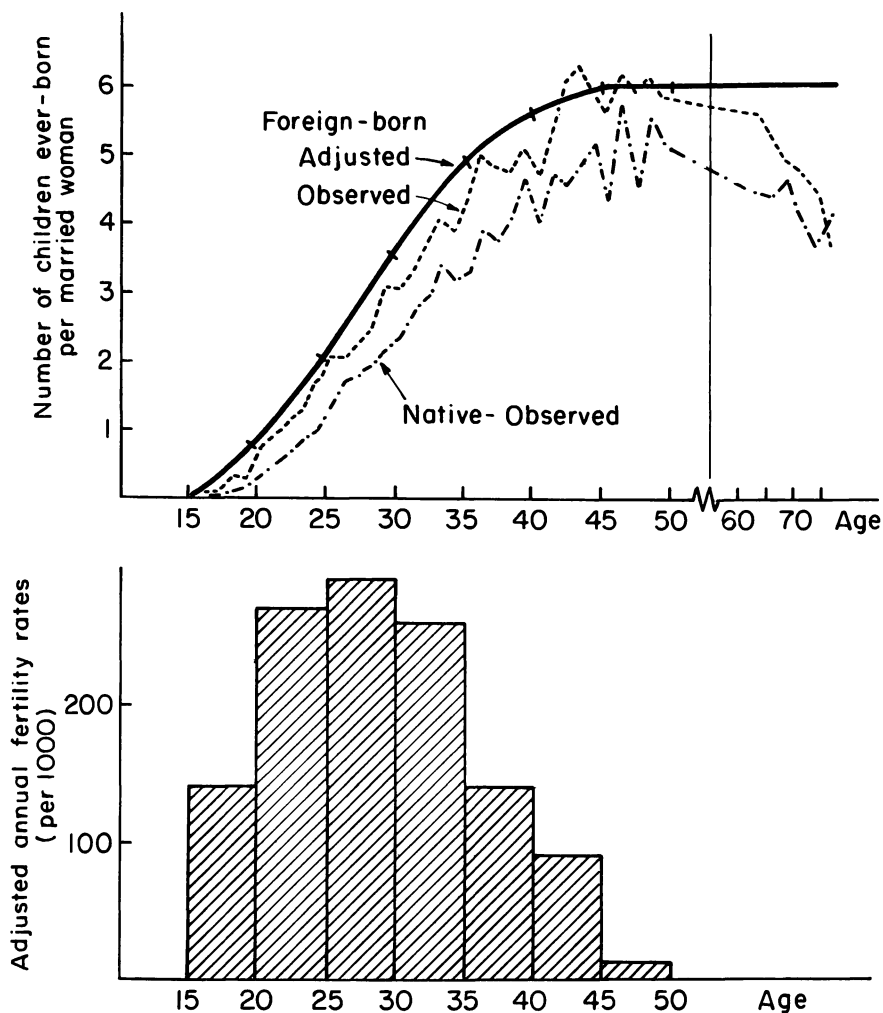
in 1895. The other one uses the age structure of the female population at the time of the census to derive replacement indices with the aid of a life table. Both procedures lead to an estimate of female fertility of the order of six children ever borne per woman aged 50. The convergence of the results obtained by independent procedures should not be taken as a proof of the accuracy of the estimate, but rather as an indication that the results may be close to the true value.

The fundamental hypothesis in the procedure suggested by Mortara is that fertility is a function of the age of women, invariable with time. So, if the data provided by a census on the number of children borne are broken down by age of women it is possible to derive the age-specific fertility rates and the gross reproduction rates. To use the method, two different kinds of problems should be faced.

First, it is necessary to decide whether or not the hypothesis is acceptable. In the case under consideration, in view of the lack of information that would indicate whether any decline in the fertility had already occurred in Argentina, the assumption is accepted.

The second kind of problem is in relation to the quality of the census information. Several obstacles are presented: 1. Inaccuracies in the age reporting of women, which alter the regular variation of the number of children born as the age increases. This obstacle is easily removed by using well-known procedures to smooth data. 2. Omissions in the reporting of children ever born, which is a serious obstacle because it is systematic; women tend to report a number of children ever born lower than the real one. Some explanations have been advanced: omission of children who have died at very young ages, or memory lapses—especially in the case of women of advanced age. It is difficult to correct this bias. If Figure 1, representing the number of children ever borne by women classified by age and nativity, is carefully observed it can be concluded that the index takes relatively high values, especially after age 30, for ages ending in three, six or nine, and relatively low values for ages ending in zero or five. These trends could be interpreted as follows: in the first case, women with ages ending in three, six or nine who have probably reported their ages correctly have also done so regarding the number of children ever born; in the second case, the concentration of women with ages ending in zero or five, due to poor reporting, is surely also associated with a deficient reporting of children. It can be concluded, according to this interpretation, that the high indices reflect, better than the low ones, the trend of the fertility function with age. 3. The third obstacle

FIGURE 1. NUMBER OF CHILDREN EVER BORNE PER WOMAN BY AGE AND NATIVITY, OBSERVED AND ADJUSTED (TOP), AND ADJUSTED ANNUAL FERTILITY RATES PER 1,000 WOMEN, BY AGE, ARGENTINA, 1895 (SEE TABLE 2)



presented by the census information in Argentina is that the questions on fertility were asked only of married or widowed women. To arrive at an estimate of the fertility level of the population it is necessary also to take into consideration the fertility of single women. The problem is important because in the native population in 1895, the proportion of single women was high and the incidence of illegitimacy important,

as disclosed by information provided by vital statistics⁹ and the Census of the Province of Santa Fe.⁴ To deal with this problem, the information on the foreign-born population was consulted. The proportion of illegitimate births among the immigrants was unimportant. Furthermore, the percentage of women reporting themselves as single was very low. For these reasons the census information on number of children born for the foreign-born population, in spite of being limited to married and widowed women, is probably appropriate to give a measure of total fertility.

The smooth curve represented in Figure 1, which follows approximately the high points of the observed indices (to avoid the misreporting of children, as explained above), and even exceeds their level, especially for young ages (to make some allowance for the illegitimate fertility that is concentrated at these ages), is adopted as the accumulated fertility function with age. In Figure 1, the annual fertility rates for age groups are also presented. They are derived from the former function. The number of children ever borne per woman, at the age of 50, is 6.00, equivalent to a gross reproduction rate of 2.93.

Equally valid reasons may be found to indicate that the fertility of the native population was higher than the one corresponding to the foreign-born, as may be found to support the contrary argument. On the one hand, as will be shown below, the average number of children ever borne per married woman is clearly higher among the Argentineans than among the immigrants; as stated above, the illegitimate fertility was also higher for the former than for the latter. On the other hand, it can be shown that the proportion of ever-married women by age is significantly higher in the foreign-born than in the native population.

In view of the foregoing considerations, the impossibility of measuring the effect of the above-mentioned trends, and for the sake of simplicity, it was decided to accept the estimate of fertility for the foreign-born population as representative of both the native and the foreign born. The resulting values are shown in Figure 1 and Table 2.

The estimate of the level of fertility that has been worked out, needless to say, has obvious limitations inherent in the procedure followed in the elaboration (assumption of constancy of fertility with time) and in the quality of the basic data (inaccuracies in the reporting of age of women, omissions in the reporting of children ever borne, lack of information on illegitimate births to single women). It is appropriate to try through another procedure and on the basis of different infor-

TABLE 1. ARGENTINA: SOCIODEMOGRAPHIC INDICES OBTAINED FROM NATIONAL CENSUSES

Item	Year of Census		
	1869	1895	1914
Total population	1,737,076	3,954,911	7,885,237
Urban population (cities of 2,000 and more)	491,392	1,479,399	4,157,370
Immigrant population	211,993	1,004,527	2,357,952
Urban population	28.3%	37.4%	52.7%
Illiteracy (population over seven years old)	78.2%	54.4%	34.1%
Children age 6-14 attending school	19.0%	29.6%	59.1%
Immigrants (population over 15)	18.8%	37.2%	43.8%

Period	Annual Geometrical Rates of Growth			
	Duration (in Years)	Total Population	Urban	Immigrant
1869-1895	25.6	3.26%	4.39%	6.25%
1895-1914	19.1	3.69%	5.57%	4.58%

Sources: references (1), (2), (3) and (8).

TABLE 2. ARGENTINA: ANNUAL FERTILITY RATES BY AGE GROUPS, ESTIMATED FOR 1895

Age Group	Annual Rate per 1,000
15-19	140
20-24	270
25-29	290
30-34	260
35-39	140
40-44	90
45-49	10

TABLE 3. ARGENTINA: INDICES OF LIFE TABLES REPRESENTATIVE OF MORTALITY OF 1895

Index	Symbol	Men	Women
Life expectancy at birth	e_0^c	34.5	38.6
Probability of death between 0 and 5	${}_5q_0$	0.3261	0.3086
Probability of survival between 0 and 28	$p(28)$	0.5501	0.5772
Life expectancy between 15 and 50	${}_{35}e_{15}^c$	28.7	29.5

mation from the one used thus far, to find an independent estimate of the fertility level and to test the consistency of the resulting value with the one already obtained. With this purpose the age structure of the female population, as shown by the 1895 census, is used to compute Thompson's index of replacement,¹³ with the aid of a life table. From the indices obtained for the younger age groups, which reflect fertility in the years approaching 1895, one may obtain, approximately, estimates of the net reproduction rate and, therefrom, rough values of the gross reproduction rate and the number of children born per woman at the end of the child-bearing period.

A serious limitation to the application of this procedure is that it requires a life table, which cannot be constructed by the usual methods due to lack of statistical data. It does not seem appropriate to list here the steps taken to adopt the life table used in the calculations (see Appendix), but it may be of interest to note in Table 3 some particularly significant indices of the estimated mortality level.

The calculation of Thompson's index of replacement is made in Table 4, which is self explanatory. It should be mentioned that in view of the considerable importance of immigrants in Argentina at the time—many of whom, especially the adults, were not accompanied by their mothers—it was thought advisable to modify the composition of the group indicated as "daughters," as shown in Table 4. The adjustments made in this connection, although reasonable, are necessarily arbitrary.

When considering Table 4 with the intention of obtaining from its results an estimate of fertility for the years approaching 1895, independent from the estimate elaborated previously, one should not take into account the value of the index derived from the first age group (0-4), since the number of people in this group has already been adjusted to correct census omissions, using for this purpose the estimate of fertility that is being examined. From the following indices, those corresponding to ages 5-9 and 10-14, it may be said that the first one apparently exaggerates the true level.

Indications are that the number of children enumerated in this group is too high relative to others (which may be confirmed by comparison with the native population of the same cohort of the 1914 census). On the other hand, the following group appears to be underestimated. A gross calculation may, however, be made. If it is accepted that the value of the replacement index around 1895 is 1.75, it can be concluded that the net reproduction rate is about 1.63.^{13,14} To that net

TABLE 4. ARGENTINA: THOMPSON'S REPLACEMENT INDEX, 1895

Age Group	Daughters		Women			Ratio in Life Table per 1,000	Thompson's Replacement Index (J)
	Composi-tion	Number (1)	Age Group	Number (2)	Ratio (1):(2)		
0-4	N & \bar{N} *	316,033	20-44	666,556	474	278	1.71
5-9	N & \bar{N}	269,845	25-49	556,042	485	263	1.84
10-14	N & $2\bar{N}/3$	200,970	30-54	449,581	447	272	1.64
15-19	N & $\bar{N}/3$	178,585	35-59	349,589	511	286	1.79
20-24	N	135,137	40-64	264,966	510	301	1.69
25-29	N	113,536	45-69	188,799	601	323	1.86
30-34	N	84,676	50-74	138,241	613	357	1.72
35-39	N	75,182	55-79	91,058	826	413	2.00
40-44	N	56,072	60-84	66,716	840	505	1.66

* N = Native, \bar{N} = Foreign-born.

Sources: references (2) and (13).

reproduction rate, and according to the assumed mortality level, corresponds a gross reproduction rate of 2.82 and an average number of children per woman, at the end of the child-bearing period of life, of 5.8, which is near the value of 6.0 estimated through the first procedure.¹⁵ This approximate equivalence of results can be considered satisfactory, although an estimate of the fertility level slightly lower (with an hypothesis on mortality lower than the one adopted) or higher (with higher mortality) would be equally acceptable.

In summary: by means of two independent procedures a high level of fertility is estimated for the Argentinian population, around 1895, equivalent to an average of six children per woman at 50 years of age. With the fertility rates shown in Table 2, this fertility means an annual crude birth rate of 45 per thousand in 1895, a level higher than that estimated by other authors. The estimate must be considered as a provisional result subject to revision after further analysis of available data from the 1895 census.

DIFFERENTIALS IN FERTILITY

Owing to the poor quality of the basic information, it is easier to establish the existence of fertility differentials among categories of the population than to determine the level of the fertility for the total population. That is so because the former objective is only to detect differentials, not to measure them.

The published information of the 1895 census is not particularly suitable for this purpose: it provides the basis for the computation of the ratio of children to women that can be employed to assess differences in fertility by regions, and some data on the number of children ever borne by ever-married women by nativity and years of married life. Only the former is used in this paper to investigate differentials by geographic areas. The differences in fertility by nativity, as well as the others that are considered in the paper, i.e., urban-rural residence and literacy, are derived from the results of the sample of the 1895 census.

Regions

The ratio of children 0-4 to women 20-44 was computed after adjusting the number of children to correct a notorious omission—by means of a procedure in line with the deficient census information—for different geographic areas into which the country was divided. Six regions were defined, representing a rough division of Argentina into socioeconomic regions. The classes are obtained by grouping provinces and territories, keeping separate the city of Buenos Aires. The results, keeping in mind the deficiency of the basic data (even the adjustment probably could not entirely eliminate the census omissions at regional levels), show that fertility was probably uniform among regions, Buenos Aires excepted. The ratio for this city is 711 per thousand; the remaining regions show indices ranging from 901 to 1,110 (see Table 5). The national value is 960, close to the level observed in the United States between 1840 and 1850.¹⁶

TABLE 5. ARGENTINA: ADJUSTED NUMBER OF CHILDREN UNDER FIVE YEARS OF AGE PER 1,000 WOMEN, 20 TO 44 YEARS OLD, BY REGIONS, 1895

<i>Region</i>	<i>Composition (provinces or territories)</i>	<i>Ratio</i>
Capital city	Buenos Aires	711
Northwest	Tucuman, La Rioja, Catamarca, Salta, Jujuy, Santiago del Estero	901
Cuyo	San Luis, Mendoza, San Juan	966
Pampa	Province of Buenos Aires, La Pampa, Cordoba, Santa Fe, Entre Rios	1,061
Northeast	Corrientes, Formosa, Chaco, Misiones	1,090
Patagonia	Neuquen, Rio Negro, Chubut, Santa Cruz, Tierra del Fuego	1,110

Source: Reference (2).

The ratio for Buenos Aires indicates a fertility level clearly below the rest of the country. The differences between the other regions should not be accepted at their face values as the margin of error in the ratios does not permit one to draw any definite conclusion.

From here on the study of differences in fertility is done using a uniform index: the number of children ever borne by married women by age, based on the sample of the 1895 census. It was decided to base the analysis exclusively on information of married women, excluding widows, because the incidence of widowhood is different among the subdivisions of the population to be compared. Fertility differentials probably are more clearly disclosed by the category of married women than by the combined group, married and widowed. Of course, the information supplied by a sample is subject to sampling errors, and these can be important, especially in the categories where the number of women in the sample is small. To alert the reader to this the actual number of women in each category shows in the tables.

Nativity

Table 6 presents the average number of children ever born by married women, by age and nativity. Within the foreign-born group several classes are presented by specific country of birth: Italy, Spain, France and other European countries. The great majority of migrants to Argentina came from Europe.

For each category in Table 6 the average number of children ever born for the age group 15-59 as a whole is given in two versions: observed and standardized. The latter is computed by weighting the age-specific rates in each category by the distribution by age of the total married female population aged 15-59.

Observing Table 6 and Figure 2 one might draw the following conclusions:

1. The Argentinean married women exhibited higher fertility than their foreign-born counterparts.
2. Among immigrants, Italian women showed the highest and French women the lowest fertility. Spaniards, as well as other Europeans, were in an intermediate position.
3. It is evident that Europeans controlled their fertility.¹⁷ The level of complete fertility among Argentineans, not too high (about seven children per married woman), suggests that they were also beginning to apply some kind of birth control.

TABLE 6. ARGENTINA: NUMBER OF CHILDREN EVER BORN PER MARRIED WOMAN, BY AGE AND COUNTRY OF BIRTH, 1895

Age Group	Argentina	Italy	Place of Birth			Rest of Europe	Total Abroad	General Total
			Spain	France				
15-19	0.74	0.60	0.73	0.61	0.90	0.62	0.70	
20-24	1.77	1.81	1.58	1.26	1.48	1.68	1.74	
25-29	3.08	3.03	2.56	1.89	2.52	2.78	2.96	
30-34	4.30	4.05	3.85	2.89	3.67	3.83	4.10	
35-39	5.47	5.37	4.89	4.25	5.11	5.15	5.33	
40-44	6.23	6.31	6.04	5.06	5.75	6.03	6.11	
45-49	6.72	6.49	5.54	5.97	7.00	6.22	6.50	
50-54	6.42	6.30	5.95	4.54	5.67	6.10	6.22	
55-59	7.32	6.40	6.15	3.92	5.59	5.82	6.63	
15-59								
Observed	4.24	4.35	4.10	3.42	4.18	4.18	4.20	
Standardized	4.35	4.24	3.87	3.20	3.92	4.02	4.20	
Number of women	7,770	3,011	1,119	581	551	5,670*	13,667**	

* Includes 408 born out of Europe.

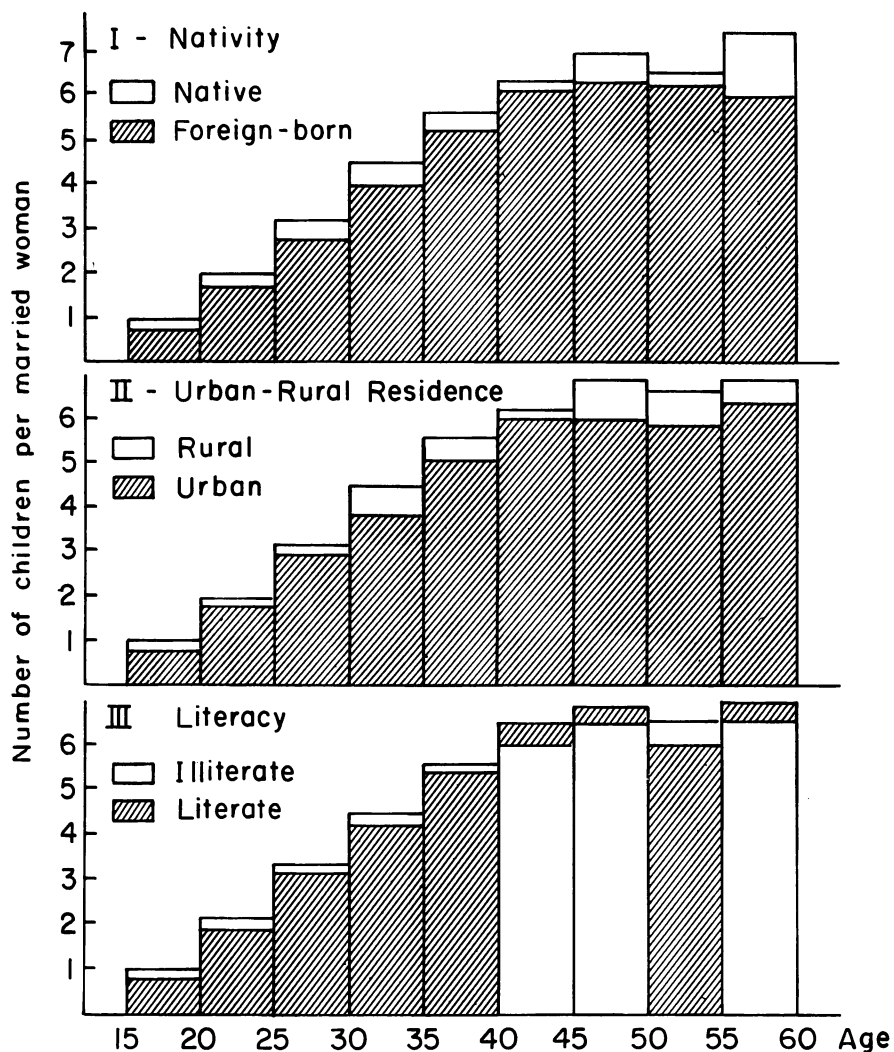
** Includes 227 with nonreported place of birth.

Source: reference (8).

TABLE 7. NUMBER OF CHILDREN EVER BORN PER MARRIED WOMAN BY AGE, RESIDENCE AND NATIVITY, ARGENTINA, 1895^a

Age Group	Total Population		Native		Foreign-born	
	Urban	Rural	Urban	Rural	Urban	Rural
15-19	0.67	0.74	0.68	0.81	0.65	0.57
20-24	1.68	1.80	1.76	1.79	1.58	1.85
25-29	2.89	3.10	3.21	3.10	2.60	3.12
30-34	3.74	4.41	4.01	4.44	3.57	4.32
35-39	5.05	5.56	5.55	5.46	4.72	5.78
40-44	5.95	6.27	6.19	6.22	5.82	6.37
45-49	5.95	6.94	6.32	6.91	5.76	7.02
50-54	5.84	6.54	6.57	6.24	5.49	7.36
55-59	6.36	6.88	7.84	6.95	5.28	6.72
15-59						
Observed	3.92	4.46	3.96	4.38	3.89	4.67
Standardized	3.98	4.41	4.32	4.38	3.74	4.49
Number of women	6,274	7,326	2,695	5,236	3,579	2,090

FIGURE 2. NUMBER OF CHILDREN EVER BORNE PER MARRIED WOMAN BY AGE, NATIVITY, URBAN-RURAL RESIDENCE AND LITERACY, ARGENTINA, 1895 (SEE TABLES 6, 7 AND 8)



Urban-Rural

Table 7 shows urban and rural fertility indices. As the existence of a differential by nativity has been established, the indices are shown separately for the native and foreign-born population. As in the previous case, the conclusions appear clearly:

1. The urban indices are lower than the rural ones.
2. This trend, not very definite among the native population, is quite evident among the immigrants.

Literacy

Finally, Table 8 presents indices of fertility by literacy. They are broken down, as seems proper after the above discussion, by nativity and urban-rural residence. Several conclusions may be reached.

1. Fertility is lower among literate than illiterate women in the total population. The difference, however, is small and statistically not significant. If it assumed that illiterate women tended to omit the number of children borne to a greater extent than did literate women the differential would increase and probably become significant.
2. The native population shows no clear differential by literacy. If the indices were accepted at their face values they would indicate an opposite trend to the one mentioned above, which is probably not true and due only to selected omission on the number of children ever borne.
3. Among immigrants the lower fertility level of literates than of illiterates appears clearly, especially in urban areas.

CONCLUSIONS

It has been estimated that the level of fertility of the population in Argentina around 1895 was equivalent to six children ever born per woman at the end of the child-bearing period of life. The result should be considered with caution, since it is based on deficient information and a debatable hypothesis. The estimate, then, has a provisional character and should be critically reexamined in the light of further research.

Although the estimated level is high, it is not as high as the one presently observed in several Latin American populations, with an average number of seven children ever borne per woman aged 50. Evidence may be found to explain why the level in Argentina was not so high as, for instance, the proportion of single women (the percentage was around 22 for native women aged 50) and the relevant and increasing proportion of immigrants among the population, with a fertility level per married woman lower than that of the natives.

It has been shown that differentials in fertility existed between the

TABLE 8. NUMBER OF CHILDREN EVER BORN PER MARRIED WOMAN BY AGE, RESIDENCE, NATIVITY AND LITERACY, ARGENTINA, 1895^s

Age Group	Total Population		Native		Urban		Rural		Foreign-born		Urban		Rural	
	Literate	Illiterate	Literate	Illiterate	Literate	Illiterate	Literate	Illiterate	Literate	Illiterate	Literate	Illiterate	Literate	Illiterate
15-19	0.68	0.75	0.71	0.53	0.76	0.86	0.55	0.79	0.61	0.61	0.79	0.61	0.61	0.61
20-24	1.70	1.87	1.72	2.05	1.76	1.91	1.51	1.72	1.92	1.92	1.72	1.92	1.92	1.65
25-29	3.01	3.05	3.30	2.92	3.21	3.09	2.49	2.83	3.09	3.09	2.83	3.09	3.09	3.33
30-34	4.04	4.24	4.14	3.82	4.56	4.46	3.48	3.81	4.32	4.32	3.81	4.32	4.32	4.45
35-39	5.33	5.45	5.58	5.51	5.85	5.47	4.43	4.93	5.77	5.77	4.93	5.77	5.77	6.01
40-44	6.38	6.03	6.48	5.63	6.66	6.21	5.97	5.61	6.76	6.76	5.61	6.76	6.76	6.32
45-49	6.72	6.52	6.46	6.26	8.06	6.78	5.88	5.92	7.38	7.38	5.92	7.38	7.38	6.71
50-54	5.91	6.54	6.21	7.34	6.29	6.29	5.48	5.66	6.13	6.13	5.66	6.13	6.13	8.45
55-59	6.93	6.57	8.34	7.45	7.96	6.78	5.28	5.32	6.69	6.69	5.32	6.69	6.69	6.63
15-59														
Observed	3.92	4.58	3.80	4.34	4.13	4.61	3.63	4.30	4.37	4.37	4.30	4.37	4.37	5.05
Standardized	4.22	4.28	4.40	4.22	4.65	4.39	3.67	3.89	4.50	4.50	3.89	4.50	4.50	4.59
Number of women	6,400	5,993	1,747	733	1,630	3,124	2,030	1,222	993	993	1,222	993	993	914

natives and foreign born, the urban and rural and, to a lesser degree, between the literate and illiterate. The differences are particularly distinct among the immigrants. The existence of differentials in fertility, at a time when the country was undergoing a vigorous social and economic development, which implied remarkable advances in urbanization and literacy, and receiving sustained European immigration, could have anticipated the decline in fertility that was about to start, if it had not already started, and that gathered momentum after 1914.

APPENDIX

Due to the lack of adequate information on the number of annual deaths, it is impossible to estimate the mortality of the population in Argentina in 1895 by computing a life table following the usual procedures. It is necessary, for that purpose, to resort to indirect methods.

First, it was possible to discern clear mortality differentials. The existence of these is already a hint that the level of mortality was probably not extremely high. The differentials were as follows:

1. The level of mortality in 1869 was higher than in 1895. A distinct reduction in the proportion of widowed by age among natives, foreign born, men and women, as well as a decline in the relative importance of orphans (of father and mother) between 1869 and 1895, are the indications on which the proposition is based.
2. The mortality of males was higher than that of females. The incidence of widowhood by age, both in 1869 and 1895, is systematically and substantially lower among men than women; the proportion of maternal orphans is clearly smaller than the proportion of paternal orphans (information of the 1869 sample) and the life tables constructed on the basis of registered deaths for the city of Buenos Aires, using the municipal census returns of 1887, also disclose a similar trend.
3. The mortality level for natives was higher than for foreign born. The proportions of widowed by age, both in 1869 and 1895, are clearly higher for natives than for immigrants. Moreover, the same trend is disclosed by the life tables for natives

and foreign born elaborated by Latzina⁹ for the city of Buenos Aires (1887).

4. Urban mortality was higher than rural mortality. The proportion of orphans by age, maternal or paternal (information of the 1869 sample), is higher in urban than in rural areas. The difference is notably clear for paternal orphans, i.e., urban male mortality was particularly high. Epidemics were frequent at the time (yellow fever, cholera, smallpox) and probably were of greater incidence in urban areas.

To estimate the level of mortality, the following information was available:

1. The life tables for Buenos Aires, 1887, already mentioned.
2. The survival ratios computed for the native population between 1869 and 1895.
3. Information on orphans by age in 1869, that can be used to infer the mortality level with the aid of model life tables.

It is believed that the life tables for Buenos Aires for 1887 exaggerate the mortality level of the total population in 1895 because: 1. as already stated, urban mortality is supposedly higher than rural; 2. during 1887, a cholera epidemic prevailed in the city of Buenos Aires; and 3. the registered deaths employed to construct the life tables may be unduly increased by deaths of nonresidents in the city. It was decided that the resulting estimate of the mortality level for the country in 1895 should be lower than the one described by the life tables mentioned above.

The intercensal survival ratios for natives show serious irregularities. They can approximately be described by the corresponding ratios of the United Nations model life tables with expectation of life at birth between 30 and 35. This again is taken as an upper limit of the mortality level in 1895, since the ratios reflect the mortality of a period during which it was declining, and because they relate only to the native population, known to have a higher level of mortality than the foreign born.

The proportions of maternal or paternal orphans by age (in 1869) permit one to infer the level of mortality using a technique described by Lotka¹³ and applied by Burch¹⁸ with the aid of model life tables. The resulting mortality level, through this procedure, indicates a life expectancy of about 40-45 years, too favorable for 1869. Under-reporting of the number of orphans is the probable reason.

Taking into account the information mentioned above, mortality tables were adopted for each sex on the basis of the United Nations model life tables with modifications. Some indices derived from the adopted tables are presented in Table 3.

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¹⁴ Another indication that this result is plausible is the following: a net reproduction rate of 1.63 corresponds to an annual rate of increase of about 17 to 18 per thousand. If the population enumerated in 1869 increased between that year and 1895, according to such rates, the resulting effect of the immigration in 1895 is consistent with the available statistics on migratory movements.

¹⁵ If the conversion from the replacement index (J) to the net reproduction rate (R) is not performed (on the grounds that it is derived from the material Lotka was elaborating and not necessarily appropriate for universal use) and J is simply taken for R, the resulting number of children ever born is 6.2 instead of 5.8.

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