Late fertility transition in Sardinia (Villagrande, 1851-2013)

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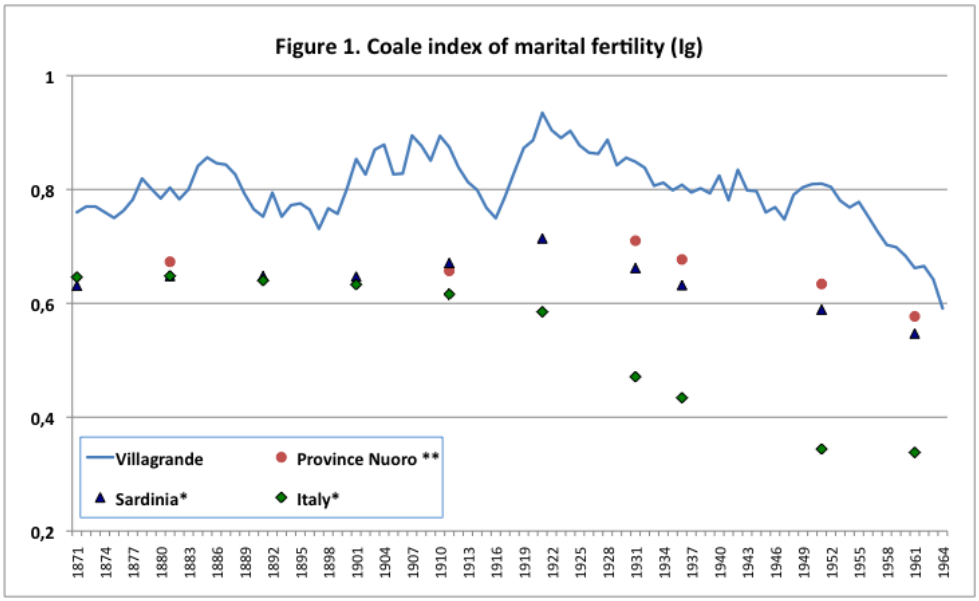
Abstract

Sardinian population experienced a late fertility transition and high level of marital fertility has been reported until the 1950's. For the village of Villagrande in Ogliastra still involved in agro-pastoral activities with traditional life style still prevalent, we reconstruct about one thousand completed families with mothers born between 1880 and 1965 and their children identified till 2013. The original results confirm that the natural fertility regime is prevalent till 1950 with a TFR25 of 6 children per mother. Thereafter the drop occurs in two steps, a fall to 4 children between 1952 and the end of the 50's and a more important fall starting in 1965 till 2 children per mother. Anthropological surveys allowed identifying the main drivers of these important changes: improved well-being associated with better social security and development of the pension system, opening of the village to the external world and later the impact of compulsory education till 14 years for children that were used to help their parents. This interesting demographic and anthropological investigation is dealing with one of the last European populations where the couples that reduced their fertility are still alive.

1. The context and the choice of the population investigated

Sardinian late fertility transition and high level of marital fertility has been reported by numerous researchers (Livi Bacci 1977, Bernardi 2007). Still in 1950's the province of Nuoro in the mountainous part of Sardinia showed the highest values for the Coale Index on marital fertility Ig among all Italian provinces during the fertility transition (figure 1). Sardinia as whole but more specifically some in-land regions of the island, mostly in the Nuoro province, were still recently characterised also by late maternity (Astolfi et al. 2007, 2009). The village of Villagrande is located at 700 meters above sea level in the province of Ogliastra, but the altitude of its territory ranges from sea level to Punta La Marmora at 1,834 meters. On 1 January 2010, 3,441 inhabitants lived in Villagrande (ISTAT) with agro-pastoral activities and traditional life style still prevalent. Despite the fact that until the 1960s this region was among the poorest within the island, recent economic developments brought the population of this area close to the average welfare standard

of the Italian population. That population was studied recently for its exceptional male longevity (Poulain et al. 2010).



*Data from Livi Bacci (1977) p. 66
** Data from Livi Bacci (1977) p. 141

2. Data used and methods

The contribution is based on a classical family reconstruction covering the beginning of the XIXth century till now. Demographic genealogical data on the whole population of the village has been collected. The families are reconstructed for all mothers born in Villagrande between 1841 and 1965. An exhaustive investigation of all children born allows considering for the analysis about 1500 completed families with 7000 children. That correspond to an average number of children around 6 up to 1950 while a strong decrease only occurred for mothers born in the '20s and children born after 1950. The completeness of the individual demographic events is exceptional as we found 97.5% of date of death or proof of today's survival for those mothers involved in the analysis. In the present contribution we consider one thousand families (based on married couples) whose wife was born between 1880 and 1965. The criteria for selecting the families were the following:

- At least one of the two parents was born in Villagrande
- No emigration is detected during the fertility period of the mother
- Both parents died when residing in Villagrande or are surviving and residing in 2013 in Villagrande

3. Analysis and results

The change in total marital fertility is assessed on two different classical ways. In Figure 2 we compute a global marital fertility index as the number of legitimate children per 1000 married. In Figure 3 we use a standardised method by considering marital fertility rates for mothers born before 1910 that were experiencing a natural fertility regime; it shows

the ratio between the observed number of legitimate births and the expected number of newborns obtained by applying the standard to the number of mothers by single year of age between 15 and 49.

The trends appearing in both figures are similar:

1. A lower level during WWI (- 10%)
2. A recuperation from 1919 till 1922 (+10%)
3. A slight decrease during the '20s up to 1930 (- 7%)
4. A stability during the '30s and during WWII up to 1944
5. A lower level during the post-war years 1945-1947 when Sardinia experienced difficult economic conditions.
6. A short recuperation during the year 1948-1952.
7. A second decrease in the middle of the '50s (-15%)
8. A plateau up to 1965 at 80% of the level under natural fertility regime.
9. A strong decrease starting in 1965 to reach 50% of the natural fertility level after 1975.

Figure 2. Evolution of the global marital fertility index: number of legitimate children per 1000 married mothers aged 15-49.

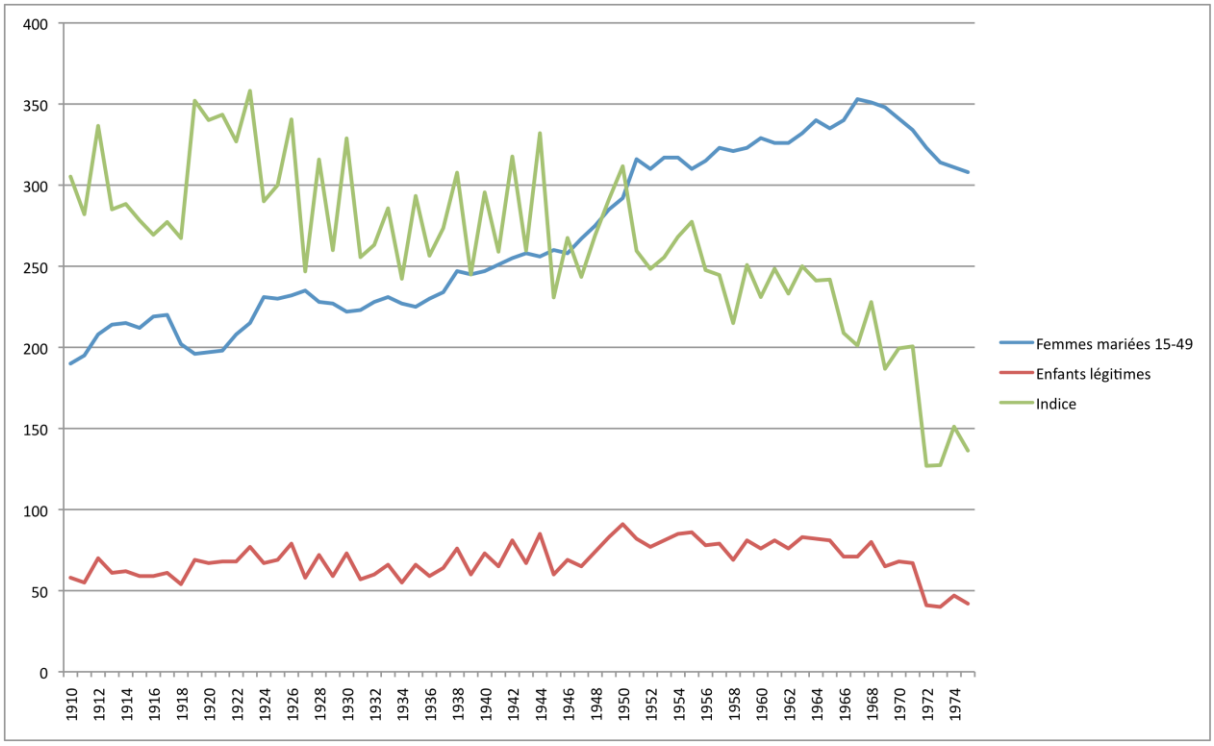
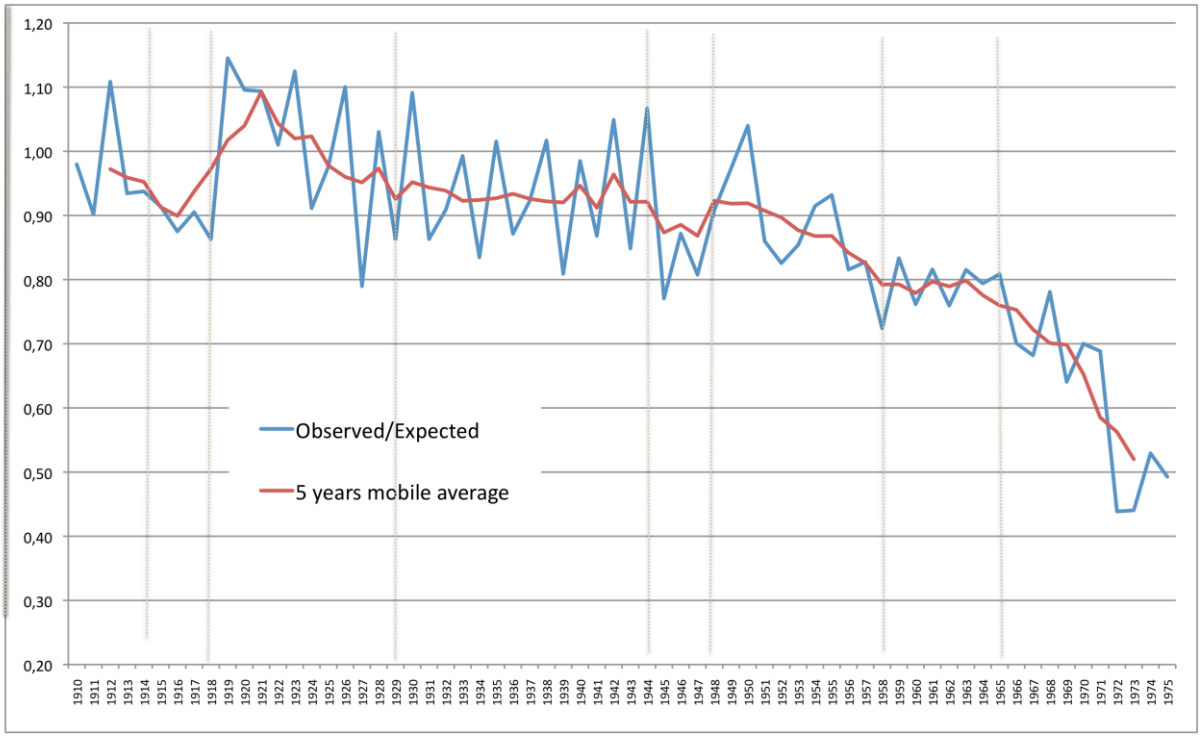


Figure 3. Evolution of the standardised marital fertility index computed by reporting the observed number of legitimate births to the expected number of new born obtained by applying the standard natural fertility rates to the number of mothers by single year of age between 15 and 49.



The Villagrande family database allows computing marital fertility rates by age group of mothers up to 1950 and figure 4 shows that the fertility level of women above 35 years start to decrease only in the 50's.

Figure 4a. Evolution of marital fertility rates by age groups of mothers between 1910 and 1989.

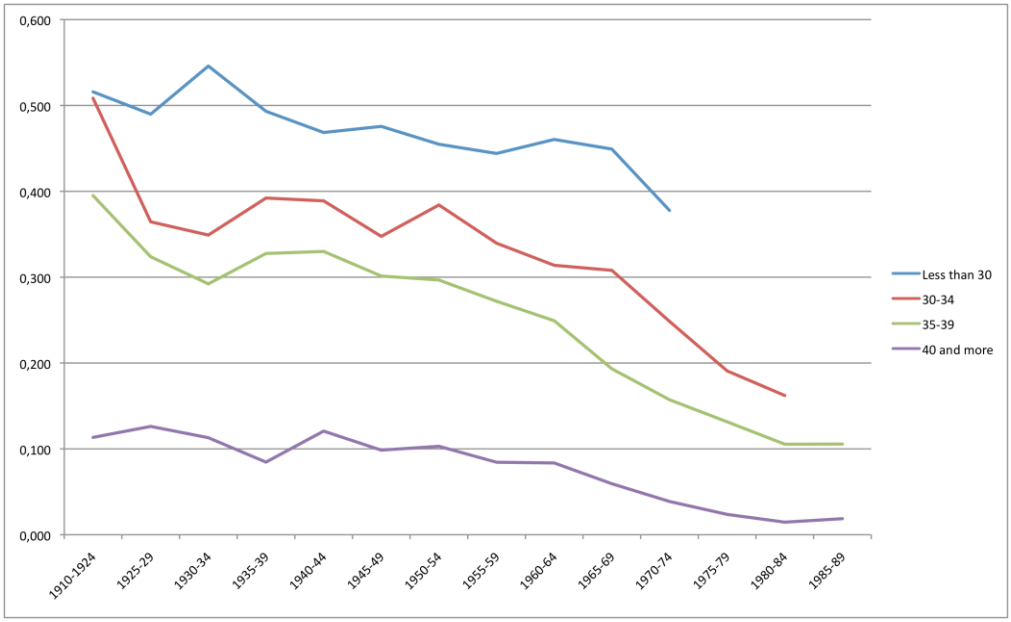
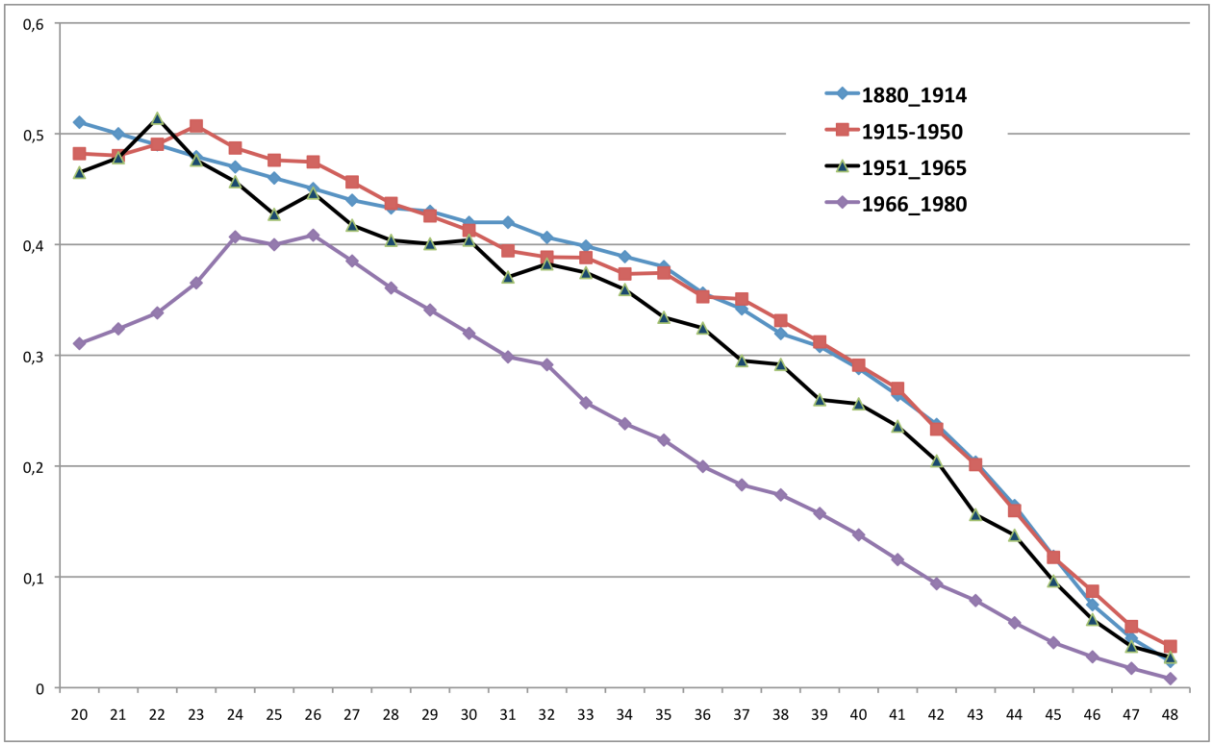


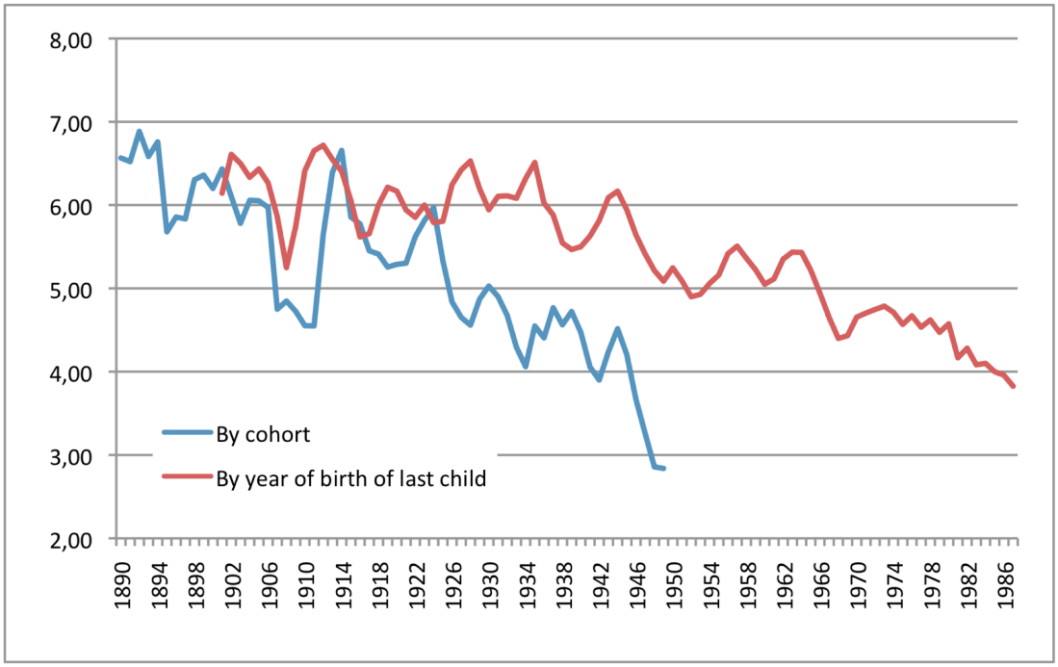
Figure 4b hereunder confirms that the biggest change was observed around 1965 while the three curves up to 1965 show a quite similar convex form.

Figure 4b. Evolution of marital fertility rates by single year of age for different groups of mothers' birth cohorts between 1880 and 1980.



Analysis of the marital fertility by considering complete families of mothers born between 1880 and 1965.

Figure 5. Average number of children per mother by mother's birth cohort (1890-1950) and by year of birth of their last child (1900-1989).



The traditional family life started relatively late in Villagrande. According the Villagrande database, the first child of mothers was born in average at age 28 years for generations born at the beginning of XXth century. From another hand, the proportion of children born from mothers aged 40 and over has always been above 10% till recently. The higher proportion is observed for children born between 1920 and 1940. The decrease of that proportion is only observed for mothers whose last children were born after 1950 (Figure 6). The last birth interval show also stable level and started increasing for last children born after 1965 (Figure 7). The probability for a mother to stop after 2 children stay low alongside the whole period of observation while the probability to stop after 3 children increased first for mothers whose third child born in the 50's and even more for mothers whose third child was born after 1965 (Figure 8).

Figure 6. Mean age at last child by year of birth of their last child (3 years mobile average)

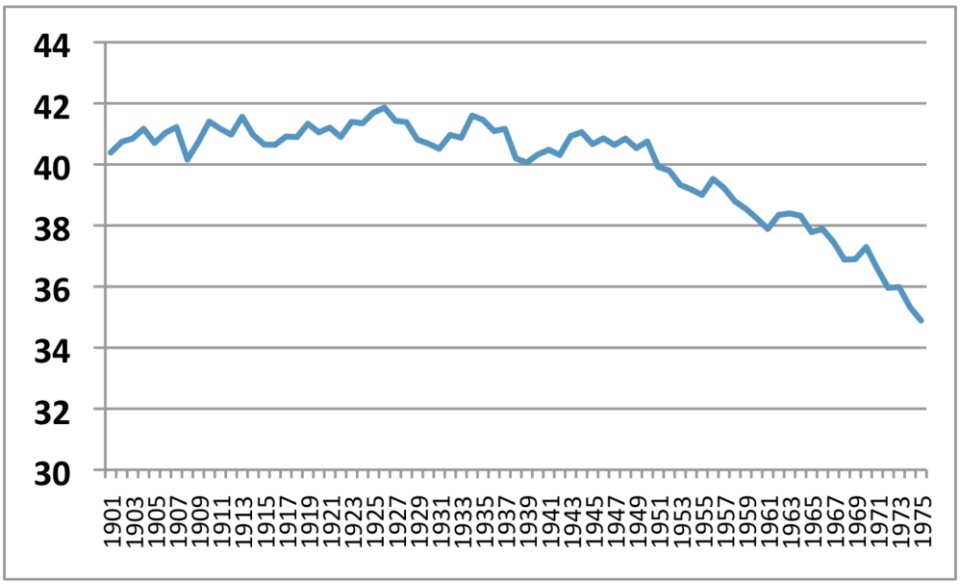


Figure 7. Last birth interval (in months) by year of birth of last child

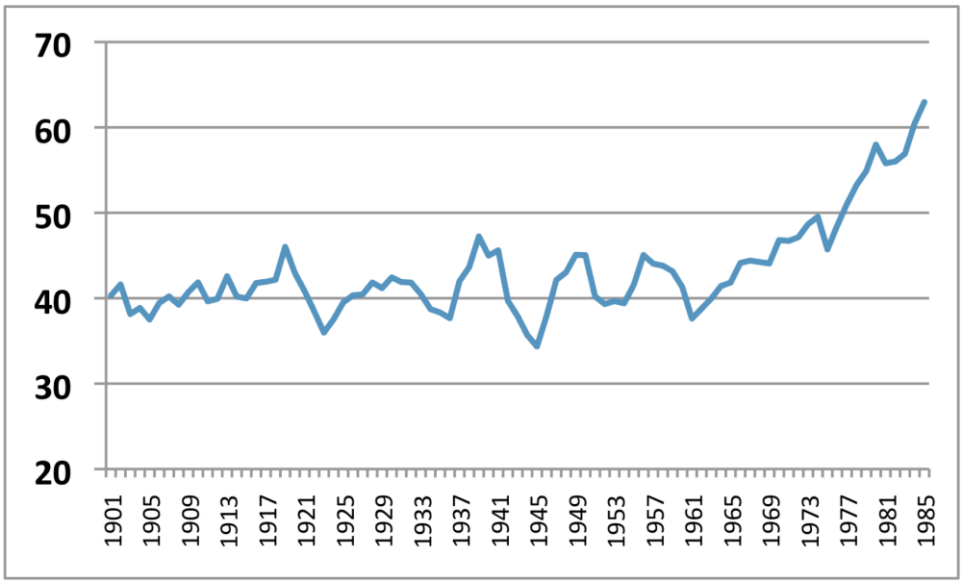
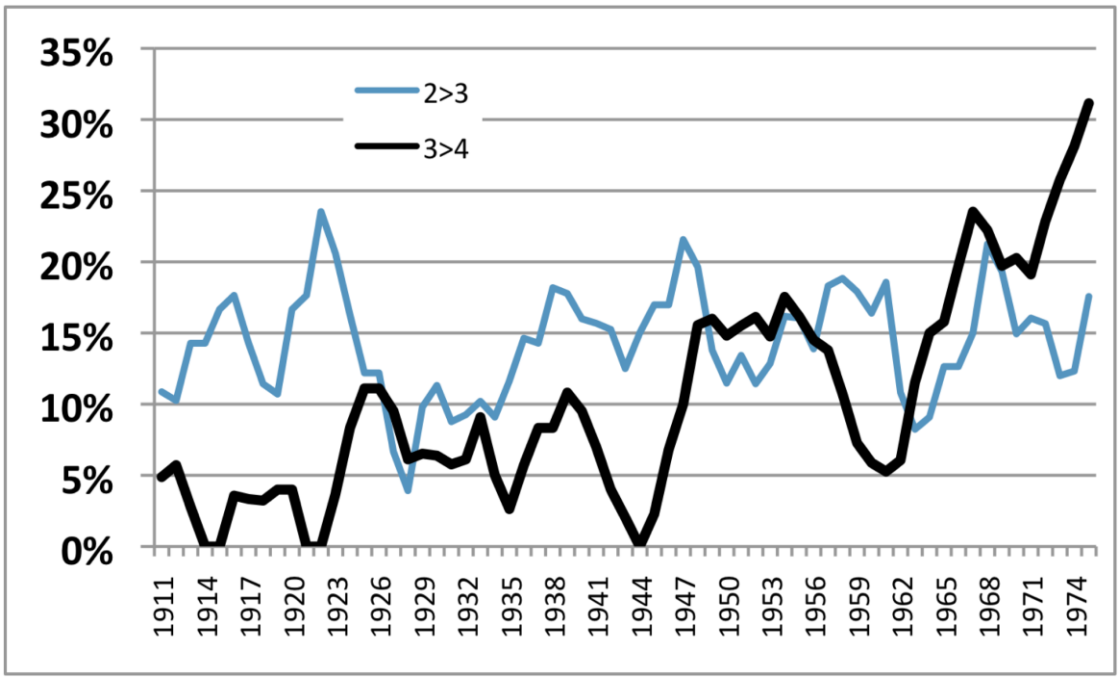


Figure 8. Proportion of mothers who stopped their fertility after 2 or 3 children by year of birth of their last child.



4. Discussion

The population of Villagrande shows very few signs indicating a fertility transition prior 1950 even between the two WW when the population on mainland Italy was experiencing a strong decline pushing Mussolini to introduce pro-natalist incentives around 1930. Despite the fact that families were disturbed by the two WW with postponement of marriages and children, there is clear evidence that the population continued adopting natural fertility regime. Starting from 1952, the fall of fertility is evident and the drop is even stronger starting from 1965. To investigate that change, we carried on in June 2013 in-depth anthropological surveys with 7 couples born in the '20s or early '30s that were the actors of the fertility transition. The main findings that could explain the fertility transitions are the following:

- During the 30's very few changes are mentioned affecting the traditional life style in the local population even if, starting from 1928, a dam was built on the neighbouring river in order to produce electricity for the whole Sardinia. It seems that the economic crisis of the 30's did now allow finalizing that project and moreover very few persons in the village were involved.
- The period of WWII could be considered as a statu quo and the majority of local families did not suffer from food shortages.
- All changes started after WWII and more precisely in 1948 when the dam was finalized and the anti-malaria campaign was initiated with the support of

Americans. The opening of the village on the external world became effective with better communications, exchange of goods and ideas and migrations.

- Several policies introduced after WWII are considered being important stimuli for the welfare of the local population and concrete changes concern social security system, pension and access to health services all occurring in the 50's.
- In the 60's the compulsory education of children introduced in 1962 is considered as important to explain the limitation of the number of children as they were obliged to go to school until 14 and cannot help anymore their parents (at home for girls, in the field or with animals, for boys). The 60's are also characterised by strong emigration flows, higher education also for women and a larger proportion of exogamous marriages.
- Considering the way the families of Villagrande succeeded to limit the number of children, we understood that most couples wanted to limit the number of children at 2 or 3 depending the sex of children already born but the method used (coït interruptus and OGINO) were not effective resulting in a 3^{d} or 4^{th} child arriving after a longer delay. That is confirm in our data with a probability to stop after the 3d child increasing strongly with the interval between the 1^{st} and 2d children decreasing and the same intervals between 2d, 3d and 4^{th} children increasing.

Further anthropological surveys are planned in March 2014 to better understand the underlying forces that could explain a very rapid fertility decline from 6 to 2 children per women within a bit more than two decades from 1952 till 1975.