HOW MANY AND WHEN? DIFFERENT APPROACHES TO STUDY FERTILITY OF MIGRANTS IN ITALY

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1. Introduction

In the first decade of the twenty-first century, immigration has reached unexpected and exceptional levels in Italy, which has become one of the main European host countries (Sobotka, 2009; Strozza, 2010). However, during this period, characteristics of immigrant population has remarkably changed: immigrant women and families have gradually increased their proportion, replacing workers alone (both men and women) who prevailed in the past, reflecting a continuous process of settlement (Dalla Zuanna et al., 2009). Looking at the residence permits, in 2013 over the 53% of women arrived in Italy for family reasons, while only 23% for work reasons.

Simultaneously with these modifications of the composition of migration flows, it has been observed an increase in the number of births with foreign parents, which has increased of about 10 times, reaching the quota of 14.5 every 100 live births in 2011. This phenomenon, in context such as the Italian one, where fertility is one of the lowest in the world (Billari, 2008), is generally correlated (at least partially) to the slight fertility increase recorded in the last few years. A contribution to fertility recover is, in fact, attributed to the increased presence of foreign women (Sobotka, 2008; Ferrara et al., 2009). However fertility choices vary greatly among immigrant women (Andersson 2004; Sobotka 2008) and the contribution on period total fertility depends not only on the incidence of migrants on total population, but also on the composition of migrants in terms of countries of origin (Mussino and Strozza 2012).

Even if in Italy the literature has mainly focused on quantify the contribution of the foreign component (Golini, 1968; Natale and Strozza 1997; Guerrizio et al.

2003; Strozza et al. 2007; De Bartolo and Stranges 2008; Ferrara et al. 2009), some recent studies have tried to understand the principal determinants of immigrants' fertility (Mussino, Strozza, 2012; Ortensi, 2015), mainly founding strong differences by citizenship and migration strategies.

This paper focuses on the immigrant population's reproductive behaviors with the intent of gaining a better understanding of factors affecting fertility at destination. Particular attention has been given to the background of the women in terms of home country and migration strategy.

We aim to investigate this theme following two different approaches (i) quantum of fertility, i.e. number of children born to a woman and (ii) tempo, i.e. transition to the first child in the destination country.

We believe that both these aspects of fertility are strongly affected by the past experience of migration and cultural heritage of the home country, as well as the social, economic and familial situation of woman at destination. With this work we concentrate mainly on factors linked with the home-country background and the pattern of migration.

The choice of analyzing both the quantum and tempo dimension of fertility allows us to give a more articulate contribution to the debate about migrants' fertility. In fact, some theories about migrants' fertility refer to quantum (e.g. socialization, adaptation), whereas other look explicitly only to the tempo dimension of fertility with indirect or no consideration of the quantum dimension (e.g. disruption and interrelation). Furthermore, by means of this twofold approach we are able to investigate how country of origin and migratory pattern influence differently or in the same way the quantum and the tempo of fertility for immigrant women in Italy.

2. Theoretical background and Research hypotheses

As already mentioned, different hypotheses, not mutually exclusive, have been elaborated about migrants' fertility behaviours. The most important are five: (i) adaptation, arguing that couples migrating to a country with different fertility levels than their home country initially continue to exhibit fertility patterns akin to those of their home country and, over time, adapt to patterns found in the destination country (Hervitz 1985; Mayer and Riphahn 2000; Andersson 2004), (ii) socialization, whereby a woman's fertility behaviour is dictated by norms found in her childhood environment (Degraff et al. 1997; Guilmoto and Rajan 2001), (iii) selection claiming that migrants are not a representative group of their country of origin due to the mere fact that they are attracted to the host country, which might also make them more predisposed to taking on its forms of behaviour (Kahn 1994)

(iv) disruption supporting the idea that migration itself causes an initial drop in fertility in the immediate periods before, during and after migration, but is later followed by a subsequent acceleration of fertility to compensate (Ford 1990; Goldstein and Goldstein 1981; Kahn 1994), (v) Interrelation or life course hypothesis argues that migration and fertility are interrelated events (Andersson 2004; Milewski 2007). Although the aforementioned hypothesis are not mutually exclusive, there is not clear consensus on what mechanisms play a role on timing and pattern of fertility among foreign populations.

We focus on background and migratory patterns of women, considering specifically: country of origin, age at migration, typology of migration (work or family reason) and presence of children before migration.

Among the immigrants' characteristics influencing fertility, literature has given large emphasis to their countries of origin that is often considered a proxy of their values and cultural heritage, which can be maintained after migration (Coleman, 1994; Gabrielli et al., 2007). Therefore, persons from different geographical origins may show differences in reproductive behaviors in the same country of destination (Andersson, Scott, 2007; Bijwaard, 2010). This is particularly true for the Italian context, where previous studies have described the wide variety of origins characterizing migrant flows (Mussino et al., 2015). In adding, both the age at arrival and the fertile period after migration may affect the childbearing of immigrant women in the destination country (Wolf, 2014). Adserà and Ferrer (2011) noted how childbearing increases smoothly with increasing age at migration because of a reducing assimilation to low fertility of natives. The authors describe how "there are different mechanisms through which age at arrival may be relevant to immigrant outcomes ... moreover if there are critical ages at which individuals learn a particular behavior or skill" (p.16).

The typology of migration is obviously extremely interrelated with fertility. However, literature has also shown how this aspect is also connected with gender role of woman in the sending country (Carling, 2005; Hiller, McCaig, 2007). Gender roles and norms in the home country determine women's social, occupational and economic positions, women's participation in international migration and in turn different outcomes in the new country of settlement. An egalitarian gender system incentives women to migrate as forerunners, independently from a partner. These women can be either single or in union, leaving the family behind. Scholars have underlined how the experience of migration changes dramatically between forerunners and followers (Nedoluzhko, Andersson, 2007; Ortensi, 2015). First migrant women, in most cases, migrate with a project related to work and childbearing can be considered as secondary goal. Family migrants are, conversely, less or not subjected to the trade-off between work and family. Women who migrate

for family reasons choose often not to enter into the labour market, as the commitment to family life is the main aim after migration.

The interplay and the complexity of these individual and migratory characteristics call for further investigation in their relationship with fertility.

3. Data and methods

We gain our data from the survey on "Income and Living Conditions of Households with Foreigners", which has been conducted for the first time in Italy in 2009 by the National Institute of Statistics (ISTAT). This survey 'replicates' the EU-SILC one in terms of questionnaires, techniques, imputation and integration of data, but it focuses exclusively on foreign population, collecting data on about 9,000 foreign individuals aged 15 and older. The main disadvantage is that the survey is focused on income, poverty and living conditions; thus it is not targeted to study fertility and it does not provide any direct information on the number of children ever born to women and women's childbearing histories.

Nevertheless, it is possible to reconstruct information on fertility behaviors with the application of the own-children method (Cho, Retherford, Choe, 1986). It employs numbers and ages (or birthdates) of young co-residing children, who are unlikely to have left home, to provide estimates of the numbers and/or timing of births to women in the same household. This approach has been applied to surveys in several European countries for the study of fertility (Bordone et al., 2009; Klesment et al., 2014). The used data provide the identification number of the mother for each child in the household, allowing the right mother-child match. Moreover, to control the permanence of children in the mother's household at the time of interview, according to the literature (Rondinelli et al., 2006) we limit the age at interview of mothers to 40 years old in order to have the majority of children relatively young and therefore less likely to have left parental house.

This kind of application brings at least another additional issue to the methodology: migrant women can have children left abroad. These children obviously do not co-reside in the household at destination and their omission would bias downwards fertility estimations. In our data we have a dummy about the presence/absence of children born abroad, thus we were able to control at least partially such issue.

We decided to select only foreign women (according to their citizenship) arrived in Italy after the age of 14 years. We excluded from our analysis also women married to an Italian partner, as they would constitute a very specific subgroup whose reproductive behaviors are expected to be significantly influenced by the presence of the native partner. The final sample is constituted of 2.388 women.

To answer to our research question we focus on two different approaches: first, we analyze the number of children born after migration using Poisson regression models; secondly we apply Event History models to study the transition to the first child in Italy. We identified children born after migration on the base of their birth date, which must be subsequent to the date of the mother's arrival in Italy. Co-resident children born before their mother arrived in Italy are therefore excluded from our analysis.

- The Poisson regression models has as target variable a count data. This is a form of regression analysis which assumes the response variable Y to have a Poisson distribution, and the logarithm of its expected value can be modeled by a linear combination of unknown parameters. Immigrant women are exposed to the risk of the events, i.e. having children after migration, for a different amount of time, depending on their age at arrival and their age at the interview. We adjusted the Poisson model with the length of fertility period spent in Italy, considered as the "exposure", i.e. a predictor with a coefficient constrained to 1. We illustrate the effects of independent variables on fertility expressed by means of Incidence Rate Ratios (IRR).
- Timing of childbearing was studied making use of a life course approach (Courgeau 1989, Kulu and Milewski 2007). First, we applied a non-parametric analysis: the transition from parity 0 to parity 1 was studied using Kaplan-Meier survival curves. Secondly, we estimated the hazard ratio of having a first birth in Italy using the piecewise-exponential model (Allison 1984; Blossfeld and Rohwer 2002). For the process of having a first birth, the entry in the process was the arrival time in Italy, and the hazard was assumed to be constant within each of the segments (0–12, 12–24, 24–36, 36-52 months and 52 months and over), but the hazard might vary between segments.

Variables intend to give a picture context of origin and migration pattern. We included in the analysis: citizenship, age at arrival, typology of migration (work or family reasons) and the presence of children born before migration.

4. Results

Descriptive analyses

Looking at the characteristics of immigrant women, the distribution by citizenship shows a net prevalence of the Romanians (29.3%), followed by the Albanians (11.2%) and Moroccans (9.4%). The Ukrainians/Moldovans represent 6.4% of the immigrant women, whereas the Chinese and the Poles are respectively 4.6% and 3.9%. The rest of women come in equal proportion (ranging from 7% to 10%) from the rest of the countries of Asia, Africa, Latin America and East Europe areas . The only exception is represented by immigrants originating from Europe-15 (EU15) and other developed countries (MDCs including the ones of North America, Oceania, Israel and Japan) who represent only 2.0% of immigrant women.

The majority of women arrived in Italy as independent migrant (66.5%) and before starting their reproductive life, i.e. without children born before migration (70.7%). Women arrived in Italy at the mean age of 24.5 years old and spent in Italy a period of 6.6 fertile years during which they gave birth to less than one child per woman on average (0.6). However, the number of children born to these women after migration shows a marked variability ranging from zero to six.

Table 1 – *Characteristics of the sample.*

Variables	N	%
Age at arrival		
15-20	625	26.4
21-25	763	32.2
26-30	544	23.0
31-40	435	18.4
Children born before		
No	1,688	70.7
Yes	700	29.3
Typology of migration		
Independent	1,589	66.5
Family	799	33.5
Country/Area of citizenship		
Romania	700	29.3
Albania	268	11.2
Poland	93	3.9
Ukraine and Moldova	152	6.4
EU15 and other MDCs	47	2.0
Other Europe	186	7.8
Morocco	225	9.4
Other Africa	203	8.5
China	110	4.6
Other Asia	238	10.0
Latin America	166	7.0

Source: authors' elaborations on "Reddito e condizioni di vita delle famiglie con stranieri"2009.

Quantum analyses: Poisson model

Age at arrival shows a slight ∩-shape of the IRR ones controlling for the exposure time. Having children before migration reduces the probability of an additional child in the host country of almost 60% (IRR 0.40). At the same time the migratory pattern has a predominant role in explaining fertility at destination, as family migrant has almost a double risk of having an additional child than women who arrived as independent migrant (IRR 1.92).

Even controlling for different characteristics of women, citizenship maintains a significant role in predicting different levels of fertility. Considering the Romanian women as the reference group, the Chinese, the Moroccans and other Africans assume more than double levels of fertility. However, the Moroccans have not the highest IRR as can be expected according to descriptive analysis: this result

appears once we control for the typology of migration that modifies significantly the IRR of the Moroccans from 2.41 (not shown) to 2.06. Other Asian countries, the Albanians and other Eastern European countries assume as well incidence rate ratios (IRR) greater than 1. While the Polish, the Ukrainians/Moldavians and the Latin Americans do not show values significantly different with respect to the reference group.

Table 2-*Determinants of number of children after migration. Poisson model.*

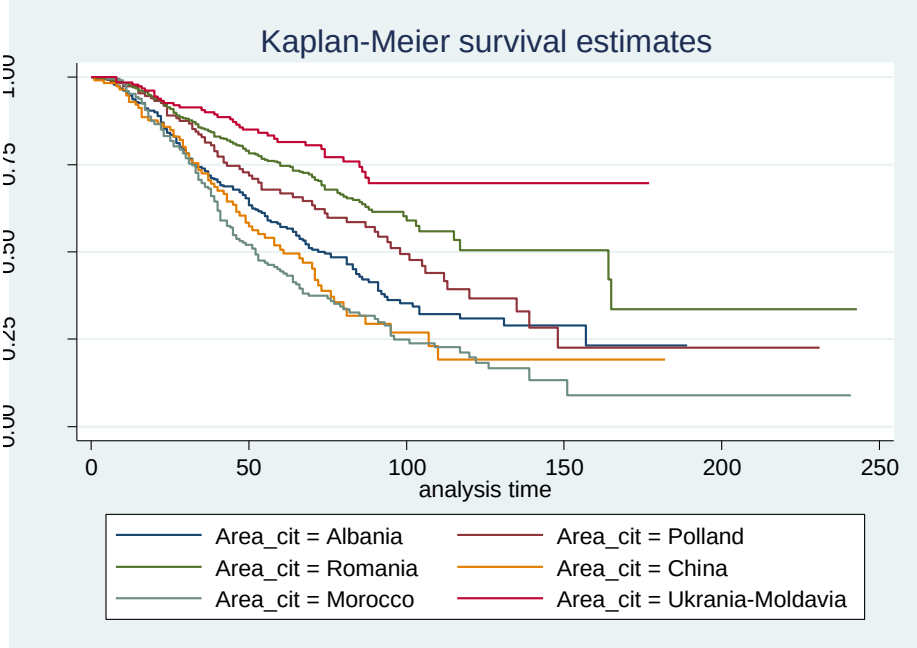
Women characteristics	IRR	Sig
Age at arrival	1.12	
Age at arrival (squared)	0.99	
Child born before migration		
No	*ref.*	
Yes	0.40	**
Typology of migration		
Independent	*ref.*	
Family	1.92	**
Country/Area of citizenship		
Romania	*ref.*	
Albania	1.57	**
Poland	1.08	
Ukraine and Moldavia	0.63	
EU15 andother MDCs	0.52	
Other Europe	1.50	**
Morocco	2.06	**
Other Africa	2.02	**
China	2.39	**
Other Asia	1.44	**
Latin America	0.96	
Constant	0.01	***
Log likelihood	*-595,003*	

*Note: IRR: Incidence Rate Ratio; ref.: reference category; *: p <0.1; **: p <0.05; ***: p <0.01;*
all the estimates are adjusted according to the number of fertile years spent in Italy (individual exposure).

Tempo analysis: event-history for time to first birth (preliminary results)

The transition to a first birth appeared to vary greatly according to the mother's citizenship: the highest proportion who experienced the event were Moroccans, while almost 70% of the Ukrainians are childless. Chinese women appear to have a quite rapid transition to first birth in Italy, which is consistent with the higher IRR already observed in the quantum analysis (Figure 1).

Figure 1 – *Kaplan-Meier for time to first birth by citizenship*



When we make a distinction according to presence of children born before migration (yes/no) and typology of migration, we clearly see how these two variables related to the strategy of migration profoundly affect fertility in the host country. Figure 2 shows that the transition to first birth in Italy is lower for women that migrate after having had a child in their home country; even if we were expecting greater differences. The presence of children, regardless if they have been left in the home country or they have migrated together with the mother, reduces the risk of having a further child in Italy, particularly in the long term.

The same way, the reason of migration is strictly connected with the propensity to have a birth in the destination country. The highest risk was found for mothers who moved to Italy for family reasons. This is probably associated with the interrelation of the two events, as migration was strongly linked with family growth. Women who arrived for work reason have, instead, a significant lower risk to have a child for the whole period. In the long run the group of work migrants has about 40% of women without any child in Italy, whereas among family migrants those with no children after migration are only about 12%.

Figure 2 – *Kaplan-Meier for time to first birth by presence/absence of children before migration*

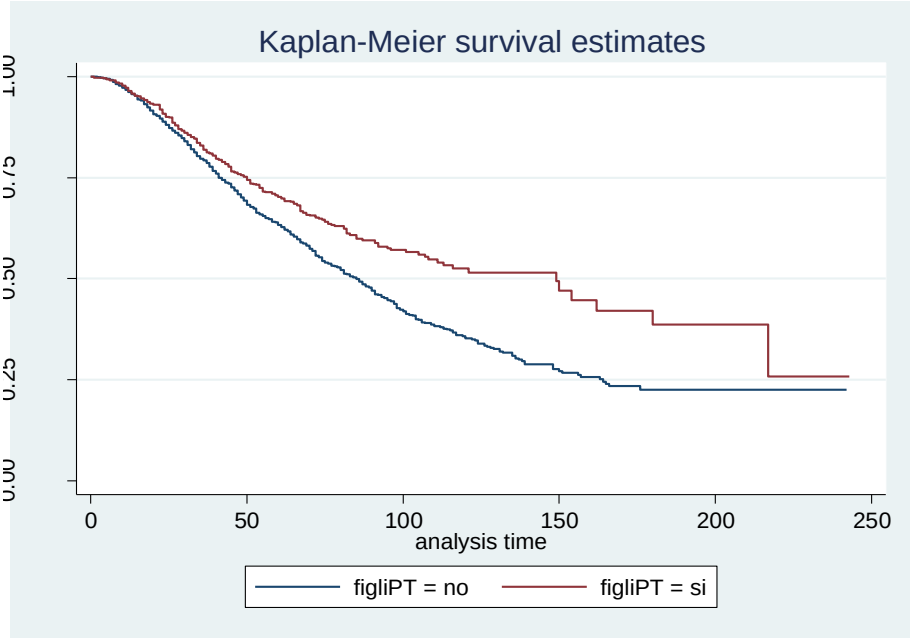
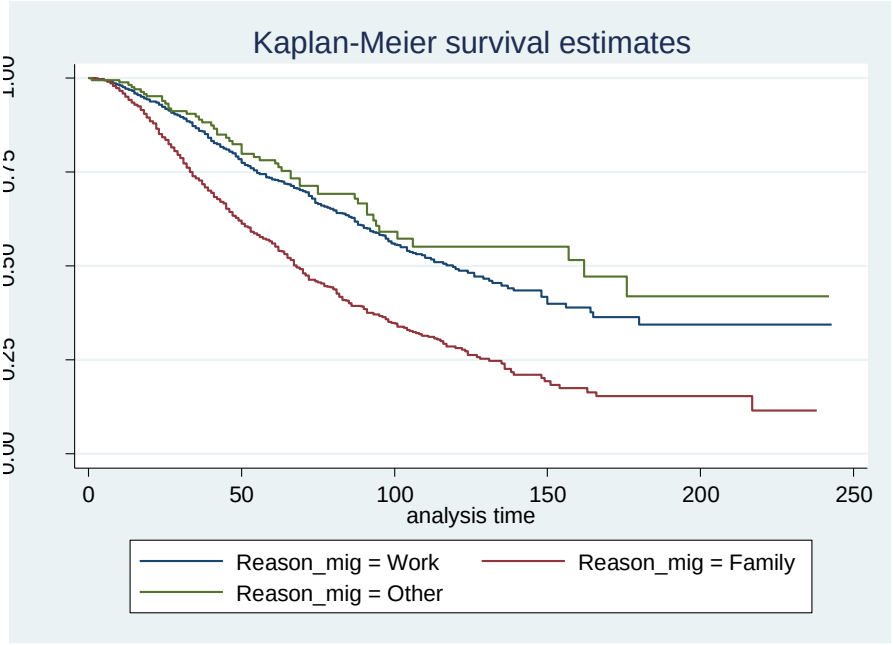


Figure 3 – *Kaplan-Meier for time to first birth by reason for migration*



5. Discussion

This paper aims at investigating the quantum and tempo dimension of fertility of immigrant women after migration. Our results show how unconventional data and methods can provide useful research elements on fertility debates of migrants in a context characterized by paucity of information. This study confirms the importance of the interrelationship between migratory and reproductive behaviors. The experience of migration can shape fertility behaviors in different ways. According to the literature, among immigrant women the country/area of origin (Mussino et al., 2015), the migratory patterns and the gender roles (Ortensi, 2015) represent important determinants of migrants' fertility outcomes after migration. In particular, citizenship maintains a significant role in predicting different levels of fertility even controlling for different characteristics of women: Africans together with the Chineses assume the highest fertility level while the East-Europeans show the opposite.

Moreover, there are important intersections among gender role, migration strategy and labor participation in defining reproductive behaviors of immigrant women. Migratory strategies related to gender roles show how family migrant have a higher risk of having a child than women who arrived as independent migrant.
Further analysis would complete the picture by investigating the role of women characteristics at destination (e.g. educational level, the work experience) as well as the union status, using this variable as time-varying in the event history models.

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