

## **EPC 2026 – Extended abstract**

### **Fertility trajectories of mothers in Italy:**

#### **On the interrelation of adverse reproductive experiences and second births**

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### **Introduction and research question**

Adverse reproductive experiences (ARE) are part of the life course of many women, and men. About one in five pregnancies end in miscarriage (Quenby et al. 2021). Almost one in five women are affected by infertility over their reproductive life course in high income countries (WHO 2023). The likelihood and frequency of pregnancy loss and of periods of infertility may be further increasing as the so-called fertility postponement, i.e., increasing ages at births, is an ongoing demographic trend in the Global North. Higher maternal age is a non-modifiable risk factor for miscarriage (du Fossé et al. 2020) and for infertility as it reduces the likelihood of natural conception (Dunson et al. 2002), and lowers the success rate of assisted reproductive technology (ART) treatments (Habbema et al. 2015).

Yet, presently dominant theoretical frameworks and empirical studies on fertility center on socio-economic and cultural determinants, and the role of social policies in shaping its change and variation across time and space. While abortion and miscarriage have been virtually absent from demographic research in Europe for long, infertility and the use of ART emerged on the agenda of demographers about two decades ago and are receiving increasing attention. On the micro level, fertility researchers have rather recently begun to examine the effects of ARE on fertility intentions and their realization (Shreffler et al. 2016; Beaujouan et al. 2019; Erato et al. 2022; Beringer & Milewski 2024; Greil et al. 2024). From a life-course perspective, such events can be framed as crisis events which may disrupt the subsequent fertility trajectory and other domains in the life course. Johnson et al. (2018) proposed a concept of "reproductive careers," which frames infertility, births, and ARE as "interlinked events" in the life course that collectively shape reproductive lives over time (Johnson et al. 2018, 2023).

Our study contributes to the emerging field of empirical studies, which implement ARE in fertility research in order to estimate the full reproductive load of women. Our research question is: What are the patterns of adverse reproductive experiences and second births among mothers in Italy? In this study we apply the life-course perspective to reproductive experiences prior to and following the first birth. We assess how they impact the transition to a second child, that is if it occurs and when in women's reproductive trajectories. To account for the well-documented age-related fertility decline, we include women's age at first birth as our main stratifying variable.

Our study context is Italy, one of the first countries that reached "lowest-low" fertility (Kohler et al. 2002; Badolato 2023). The persistently low fertility coincides with high gender asymmetry in the domestic sphere and exceptionally high levels of women's domestic burden (Mencarini et al., 2017; Barigozzi et al 2023).

### **Data and sample**

We use data from the Obstetric Violence Survey, carried out in Italy in 2023/ 2024, a novel and unique data source. The survey is part of the project "FORTIES Fertility Over fortIES. A mixed method comprehensive approach to understand parental well-being and trajectories of late and latest-late fertility" (Minello et al./ project funded by the European Union - NextGenerationEU under the National Recovery and Resilience Plan (PNRR) - Mission 4 Education and research). The survey centers on mothers, aged 25 to 45 years, who had at least one child aged three to ten years at the time of the interview. Although the data are not based on a probabilistic sample, they approximate

the Italian population of mothers aged 20–45, as they are proportional in terms of age and geographical distribution.

We used reproductive histories for 1981 women who had a singleton first birth, including information on timing of their births, whether ART was used for the respective conception, and whether the respondents had experienced any miscarriage or induced abortion.

**Table 1A** displays a socio-demographic description of the sample and the age at first birth. About 70 percent of the women in the sample were 25 to 34 years old when they become mothers. Less than a fifth of the respondents was younger than 25, and about 14 percent were older than 35 years. The majority of the respondents were Italian-born. In line with the literature on migrant fertility, foreignborn women were significantly younger upon their first childbirth than non-migrants. The majority of the sample had at least upper secondary education completed. Higher education is significantly correlated with later age at first birth. About 60 percent of them were married or had a registered union when they had their first child, about one third lived with their partner in non-marital cohabitation. Singlehood is associated with earlier entry to motherhood.

**Table 1A: Descriptive overview of the sample, socio-demographics by age at first birth (persons)**

	Age at first birth								Total	
	16 to 24 years		25 to 29 years		30 to 34 years		35 to 43 years		n (persons)	%
<b>Socio-demographics</b>	N	%	N	%	N	%	N	%		
<i>Birth cohort***</i>										
1976-80	24	4,6	101	19,4	245	47,0	151	29,0	521	26,3
1981-85	68	9,9	211	30,7	285	41,5	123	17,9	687	34,7
1986-90	104	21,5	206	42,7	172	35,6	1	0,2	483	24,4
1991-98	168	57,9	120	41,4	2	0,7	0	0,0	290	14,6
<i>Foreignborn***</i>										
Yes	35	33,0	36	34,0	22	20,8	13	12,3	106	5,4
No	329	17,5	602	32,1	682	36,4	262	14,0	1875	94,6
<i>Education***</i>										
Bachelor+	111	14,1	231	29,3	323	41,0	123	15,6	788	39,8
Upper secondary	193	18,9	353	34,6	335	32,9	138	13,5	1019	51,4
Lower education	60	34,5	54	31,0	46	26,4	14	8,0	174	8,8
<i>Marital status at first child***</i>										
Married/ civil union	159	13,5	399	33,8	470	39,8	154	13,0	1182	59,7
Nonmarital cohabitation	172	23,9	219	30,5	217	30,2	111	15,4	719	36,3
Widowed/ single	33	41,3	20	25,0	17	21,3	10	12,5	80	4,0
<i>n (persons)</i>	<i>364</i>	<i>18,4</i>	<i>638</i>	<i>32,2</i>	<i>704</i>	<i>35,5</i>	<i>275</i>	<i>13,9</i>	<i>1981</i>	<i>100</i>
<i>Calculations based on Obstetric Violence Survey (2023/ 2024).</i>										
<i>Note: *** p&lt;.001 for the association between socio-demographic variable and age at first birth.</i>										

**Table 1B** summarizes the information on reproductive experiences prior to first birth and surrounding the first delivery. About 13 percent of the respondents reported a miscarriage prior to first birth, with higher shares among women who become mothers after the age of 30. About four percent had their first child after assisted conception, which is indicative of fertility problems. In the oldest age-at-first-birth group in our sample, the percentage of ART-births was with about 8 percent the highest. Having an induced abortion has no age gradient; the share in the total sample is about six percent.

The survey further contains information on the first delivery. The type of delivery significantly correlated with the age at birth with older women more likely to have a Cesarean section (either planned or as an emergency treatment). In total, a third of the respondents gave birth to their first child by a C-section. About one in two respondents stated that they experienced their first delivery as “fairly” or “very much” traumatic. The share of women breastfeeding only in the first months is over 50 percent in total slightly higher among older mothers.

## Method

In our first steps in the analysis, we estimate the transition to a second birth applying event history models. The age of the first child serves as baseline. We display Kaplan-Meier survival estimates to visually illustrate the timing effects by age at first birth. In the multivariable discrete-time models we use the variables on reproductive experiences prior to first birth as main explanatory variables, i.e., whether the women had a miscarriage or abortion prior to their first birth, and whether the first child was conceived using ART, indicating previous fertility problems. The mentioned first-child-related variables and socio-demographic characteristics of the mother are used as controls.

**Table 1B: Descriptive overview of the sample, reproductive experiences by age at first birth (persons)**

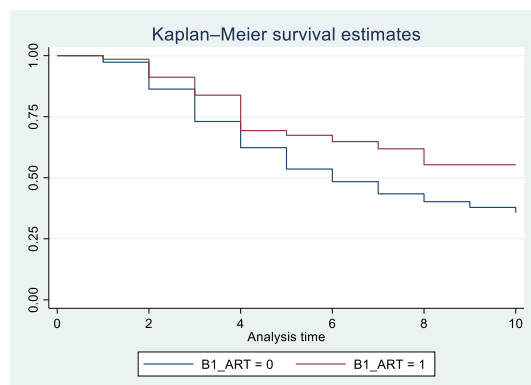
	Age at first birth									
	16 to 24 years		25 to 29 years		30 to 34 years		35 to 43 years		Total	
	N	%	N	%	N	%	N	%	N	%
<i>Reproductive experiences before first child</i>										
Miscarriage before first birth***										
Yes	23	6,3	68	10,7	100	14,2	59	21,5	250	12,6
No	341	93,7	570	89,3	604	85,8	216	78,5	1731	87,4
ART usage for first child***										
Yes	10	2,7	10	1,6	29	4,1	22	8,0	71	3,6
No	354	97,3	628	98,4	675	95,9	253	92,0	1910	96,4
Abortion before first child										
Yes	19	5,2	46	7,2	37	5,3	23	8,4	125	6,3
No	345	94,8	592	92,8	667	94,7	252	91,6	1856	93,7
<i>Characteristics of first delivery/ child</i>										
Delivery was traumatic experience										
"Not at all"	101	27,7	160	25,1	185	26,3	60	21,8	364	18,4
"Slightly"	113	31,0	207	32,4	216	30,7	97	35,3	638	32,2
"Fairly"	109	29,9	210	32,9	210	29,8	80	29,1	704	35,5
"Very much"	41	11,3	61	9,6	93	13,2	38	13,8	275	13,9
Cesarean delivery***										
Yes	85	23,4	184	28,8	218	31,0	110	40,0	597	30,1
No	279	76,6	454	71,2	486	69,0	165	60,0	1384	69,9
Breastfeeding										
Exclusively	189	51,9	322	50,5	385	54,7	153	55,6	1049	53,0
No/ mixture	175	48,1	316	49,5	319	45,3	122	44,4	932	47,0
Sex of first child										
Male	210	57,7	355	55,6	365	51,8	151	54,9	1081	54,6
Female	154	42,3	283	44,4	339	48,2	124	45,1	900	45,4
<b>Total (persons)</b>	<b>364</b>	<b>100</b>	<b>638</b>	<b>100</b>	<b>704</b>	<b>100</b>	<b>275</b>	<b>100</b>	<b>1981</b>	<b>100</b>

*Calculations based on Obstetric Violence Survey (2023/ 2024).*  
 Note: \*\*\*  $p < .001$  for the association between age at first birth and variable.

## First results

Overall, about 40 percent of the respondents had a second child until the first child was ten years old. In the total sample, the women who had a child via ART (red curve) were significantly less likely to have a second child than those with natural conception (**Figure 1**).

**Figure 1: Transition to second child, by ART-usage at first conception, full sample**

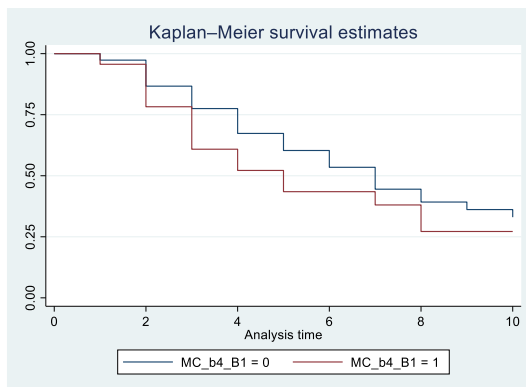


By contrast, miscarriage prior to first birth were not associated with the transition to a second birth in the total sample. The effect of miscarriage varied, however, by age: In the youngest age group at motherhood, those who had experienced a miscarriage before the first child (**Figures 2A-D**, red curves) were significantly more likely to have a second child while there was no such difference in the middle age groups and rather a negative impact among the oldest age group.

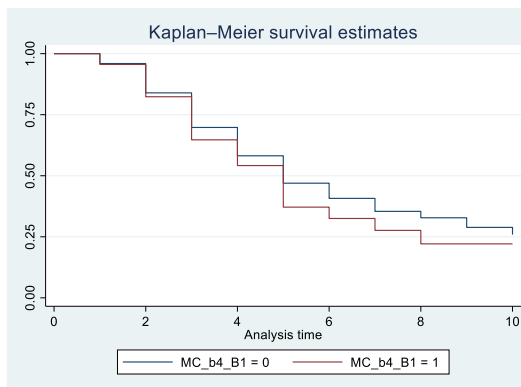
Abortion prior to first birth had no or a negative effect on the transition to a second child.

**Figures 2A-D: Transition to second child, by miscarriage prior to first child**

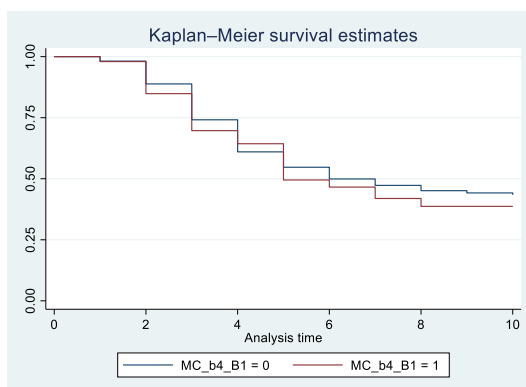
**2A) Mothers aged 16 to 24 at first birth**



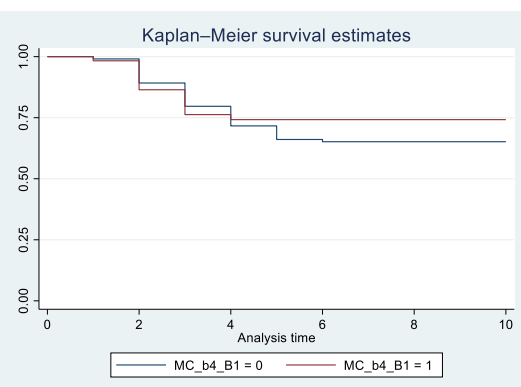
**2B) Mothers aged 25 to 29 at first birth**



**2C) Mothers aged 30 to 34 at first birth**



**2D) Mothers aged 35 to 43 at first birth**



## Conclusion and outlook

We recently initiated this project and present the findings of our first exploratory analyses in this abstract. In the subsequent stages, we will extend the analysis to include miscarriages and abortions occurring after the first birth. In addition, we intend to model the timing and sequencing of reproductive events—birth, miscarriage, or abortion—within a competing-risk set-up. Information on the first delivery and socio-demographic measures will be implemented as explanatory variables and controls.

Our exploratory results suggest that adverse reproductive experiences have a rather long-term impact in reproductive trajectories even beyond a subsequent childbirth. Thus, miscarriage, abortion, infertility/ ART usage should be analyzed jointly in women's life-courses. Such an integrated perspective may help to explain age patterns in fertility and the association between desired and realized fertility.

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