



University of
St Andrews

MigrantLife

Working Paper 3 (2021)



The intersection of partnership and fertility trajectories of immigrants and their descendants in the United Kingdom: A multilevel multistate event history approach

Júlia Mikolai and Hill Kulu



This paper is part of a project that has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant agreement No. 834103).

Copyright

Copyright © the Publisher / the Author(s). This work has been made available online in accordance with publisher policies or with permission. Permission for further reuse of this content should be sought from the publisher or the rights holder.

Disclaimer

The views and opinions expressed by the authors do not necessarily reflect those of the ERC or The University of St Andrews. The ERC and The University of St Andrews are not responsible for any use that may be made of the information contained.

MigrantLife

Understanding Life Trajectories of Immigrants and Their Descendants in Europe
and Projecting Future Trends.

[Website](#) | [Twitter](#)

The intersection of partnership and fertility trajectories of immigrants and their descendants in the United Kingdom: A multilevel multistate event history approach

Júlia Mikolai, *University of St Andrews*

Hill Kulu, *University of St Andrews*

Abstract

We study the interrelationship between partnership and fertility trajectories of immigrants and their descendants. Although there is a growing body of literature examining immigrant families in Europe, previous studies have analysed partnership changes and fertility separately. Using longitudinal data from the UK, we analyse the outcomes of unpartnered, cohabiting, and married women. We propose a multistate event-history approach, which allows for the joint analysis of repeated partnership and fertility transitions and the incorporation of different ‘clocks’. We found that the relationship between the partnership and fertility behaviours of immigrants and their descendants from geographically close countries (Europe/West) is similar to that of natives: many cohabit first and then have children and/or marry. By contrast, those from countries with conservative family behaviours (South Asia) marry first and then have (often three) children. Women from the Caribbean region exhibit the weakest link between partnership changes and fertility: some have births outside unions, some form a union and have children thereafter. Surprisingly, family patterns have remained relatively stable across migrant generations and birth cohorts. Our findings on immigrants support the socialisation hypothesis, whereas those on their descendants are in line with the minority subculture hypothesis.

Keywords: fertility histories, partnership histories, multi-state event history analysis, immigrants, descendants, cohort change, UK, UKHLS

Introduction

The share of immigrants and their descendants has increased in many European countries in the last decades (Castles & Miller, 2009). Recent social science research has investigated different dimensions of migrant and minority integration, such as their educational opportunities (Kristen et al., 2008), labour market outcomes (Adsera & Chiswick, 2007; Kogan, 2007; Rendall et al., 2010), residential and housing patterns (Shankley & Finney, 2020), and linguistic and religious diversity (Gungor et al., 2011).

Demographic research on immigrant and ethnic minority families in Europe has grown significantly over the past decade. One research stream investigates childbearing patterns among immigrants and their descendants to understand whether their fertility timing and family size is similar to that of the native population and what the reasons are for possible differences (Andersson, 2004; Kulu, 2005; Kulu & Hannemann, 2016a; Andersson et al., 2017; Baykara-Krumme & Milewski, 2017; Kulu et al., 2017). Another stream focuses on the partnership experiences of immigrants and ethnic minorities. Pre-marital cohabitation, separation and re-partnering have become common in many European countries (Thomson, 2014). Whether immigrants exhibit partnership patterns similar to the natives and whether and how partnership patterns differ across migrant generations have become key questions (Hannemann & Kulu, 2015; González-Ferrer et al., 2016; Hannemann et al., 2020). Most studies report significant diversity in the childbearing and partnership patterns of immigrants and their descendants – some groups are more similar to the natives in their behaviour than others – and often discuss this heterogeneity in the context of migrant and minority integration and social inequalities.

Longitudinal research on migrant families over the past decade has significantly contributed to improving our understanding of the factors that influence the fertility and partnership behaviour of migrants and their descendants. However, partnership formation and dissolution as well as childbearing are inherently interrelated in individuals' lives and should

thus be investigated together. This is particularly the case in the context of increasing diversity in family trajectories in Europe suggesting that behind the same childbearing patterns there may be different partnership trajectories. In the past, natives and immigrants had similar pathways to family formation: they married first and had children within marriage but immigrants, especially those from low-income countries, had more children. With increasingly diverse family lives, natives and migrants may experience different partnership and fertility trajectories. For example, similarly to the past, one group may marry first and then have children within marriage, whereas another group may cohabit first, have a first child, marry, and have another child. Yet another group may have children in a union, but experience separation thereafter. We argue that with increased family complexity and diversity (Thomson, 2014) studying partnership and fertility pathways is critical to understand how and why migrants and their descendants may differ from the native population.

Studying partnership and fertility pathways requires high-quality longitudinal data and innovative methodology. Most previous studies on migrant partnerships and fertility have focused on a single event, often first marriage or childbirth. Recent studies have analysed competing partnership transitions, especially for a first union (cohabitation vs. marriage) or the transition to first and higher order births (Andersson et al., 2015; Kulu et al., 2017; Hannemann et al., 2020). However, no study has attempted to model the complexity of entire partnership and family formation pathways. The novel contribution of this study is thus two-fold. First, we investigate partnership and childbearing trajectories together among immigrants and their descendants, which no previous study has done. Second, we propose an analytical strategy that allows us to model complex partnership and fertility transitions jointly in a multi-level multi-state event history framework. This strategy enables us to solve the three main challenges that we face when modelling complex partnership and family formation pathways: to study a) several competing outcomes jointly; b) repeated partnership formations, dissolutions, and

childbirths; and c) the role of multiple ‘clocks’ (i.e., age, union duration and/or time since previous birth and/or separation).

We use high-quality longitudinal data from the UK, a country with a long immigration history. Over the last two decades, the share of foreign-born individuals has grown from 8% in 2004 to 14% in 2019 in the UK (Office for National Statistics, 2019). The UK has also experienced migration from different parts of the world including South Asia, the Caribbean region, Africa, and Europe. This makes the UK an interesting case study for analysing the partnership and family formation pathways of immigrants and their descendants.

Background

There are five interrelated and sometimes competing hypotheses to explain partnership and fertility differences between immigrants and the native population (e.g. Pailhé, 2015; Kulu et al., 2019). The *socialisation* hypothesis states that the reason for differences in partnerships and fertility between immigrants and natives is that immigrants’ preferences and behaviours are influenced by the norms and behaviours that were dominant in their childhood environment. By contrast, the *adaptation* hypothesis argues that mostly the host country’s context influences their family behaviour. Additionally, the *selection* hypothesis stipulates that immigrants’ partnership and fertility behaviours will be similar to that of natives because immigrants are a select group; their norms and preferences are different from those in their country of origin and similar to those in the host country. The *disruption* hypothesis suggests that fertility immediately after migration will be low and marriage will be delayed due to the disruptive nature of migration. Over time, fertility and marriage levels are expected to return to normal levels (Kulu & González-Ferrer, 2014; Adsera & Ferrer, 2015). Finally, the *interrelation of life events* hypothesis emphasises that migration and family dynamics are often interrelated: many people move to form a family or move for family reunification (Kulu et al., 2019).

Recent studies in Europe have increasingly focused on the partnership and fertility behaviours of the descendants of immigrants (or the second generation). Immigrants' descendants are born and socialised in the host country but within a family of immigrants (Adsera & Ferrer, 2015). Therefore, some groups are primarily socialised into the norms and behaviours of the native population, whereas others may grow up in a minority subculture and thus display norms, preferences, and behaviours that are different from those of the natives (Kulu et al., 2019). This is often referred to as the *subculture* hypothesis and used to explain differences between the partnership and fertility experiences of the second generation and natives (Kulu et al., 2019). The *minority-group status* hypothesis (Milewski, 2010a) argues that some groups of descendants may face discrimination, which also influences social relations and thus partnership formation and fertility decisions (Glick et al., 2006; Poston et al., 2006). For example, discrimination against minorities in the labour market may reduce women's opportunities for social mobility and hence they may decide to enter the 'motherhood track' (Kulu et al., 2019). Finally, although selection is not *per se* relevant for understanding the behaviours of the second generation, the *selection effects* from the parents' generation could be extended by transmitting a preference for higher education and/or employment (Kulu et al., 2019).

Partnership formation and dissolution among immigrants and their descendants in Europe

Previous studies on the partnership experiences of immigrants have investigated the timing and type of union formation as well as union dissolution comparing the experiences of the first and second generation to those of native women across several industrialised countries. Often the focus is on marriage and divorce, but many studies also explore cohabitation, separation, and repartnering among immigrants and their descendants (Kulu & Hannemann, 2016a). Most

studies have compared the partnership behaviours of the first and second generation to those of the native population in the host country, although some have compared the behaviours of immigrants to those of non-immigrants in their home country.

In the UK, Berrington (1994, 1996) showed more than two decades ago that the partnership formation of South Asian immigrants was characterised by early and universal marriage; cohabitation and separation were very rare. By contrast, Caribbean immigrants married later, had lower marriage rates, and higher cohabitation and separation rates. For the second generation, she found that the partnership patterns converged towards those of natives. More recently, Hannemann and Kulu (2015) found that direct marriage is still the most prevalent form of union formation and cohabitation remains rare among immigrants and their descendants from India, Pakistan and Bangladesh. Although divorce rates are low among these groups, those few who do cohabit are more likely to separate and less likely to marry. Caribbean immigrants and their descendants have high cohabitation, low marriage, and high divorce rates. Immigrants from Western Europe exhibit partnership patterns similar to those of UK natives.

Studies conducted in other European countries generally found similar trends for immigrants and their descendants from different origin groups. First, immigrants from countries with conservative patterns of partnership formation have high marriage rates and low cohabitation as well as separation rates (Kulu & Hannemann, 2016a). These patterns have been observed for immigrants and their descendants from the Middle East, Iran, Turkey, and Southeast Asia in Sweden (Andersson et al., 2015), Turkish and ethnic German immigrants in Germany (Kuhnt & Krapf, 2020), and Turkish and North African immigrants in France (Pailhé, 2015). Interestingly, in Sweden, some of these groups exhibited higher rates of divorce and remarriage compared to the native Swedes (Andersson et al., 2015). A recent comparative study across the UK, France, Spain, and Estonia showed that the partnership patterns of

immigrants from countries with conservative patterns are similar across the destination countries (Hannemann et al., 2020).

Second, there is more diversity in partnership formation and dissolution among migrants from Sub-Saharan Africa, Latin America, and Europe (Kulu & Hannemann, 2016a). For example, immigrants from Latin America in Spain are more likely than the Spanish natives to cohabit and experience union dissolution (González-Ferrer et al., 2016). Eastern Europeans in Spain are also more likely to marry, whereas those from Western and Southern Europe have higher union dissolution rates than Spanish natives (González-Ferrer et al., 2016). Immigrant women from Sub-Saharan Africa in France have lower risks of direct marriage as well as of cohabitation, whereas men have higher risks of direct marriage and cohabitation than native French women and men, respectively (Pailhé, 2015). Descendants of Sub-Saharan African migrants are equally likely to marry, but less likely to cohabit than their native counterparts. Southern Europeans in Sweden have lower risks of marriage, divorce and repartnering than Swedish natives (Andersson et al., 2015). However, in France, immigrants from Southern Europe have higher direct marriage rates and men also have higher cohabitation rates than the native French (Pailhé, 2015). Men of Southern European origin have lower direct marriage rates and women have lower cohabitation rates than their native counterparts.

Fertility of immigrants and their descendants in Europe

There is a vast literature on the fertility of immigrants and their descendants across Europe (Kulu & Milewski, 2007; Kulu & González-Ferrer, 2014; Adsera & Ferrer, 2015; Kulu et al., 2019). We highlight the most recent and most relevant findings. Previous studies found significant heterogeneity in the fertility behaviour of immigrants and their descendants across Europe (Kulu et al., 2019). In the UK, Kulu and Hannemann (2016b) showed that immigrants from Pakistan and Bangladesh have higher first birth rates than the natives, whereas European

and other immigrants have lower first birth risks. Among the second generation, there are few differences in first-birth risks compared to the natives. However, Pakistani and Bangladeshi women and their descendants still have relatively high fertility levels. By contrast, descendants of Caribbean immigrants have lower second-birth risks and similar third-birth risks as British natives. The authors attributed high fertility among women of Pakistani and Bangladeshi descent to cultural factors as the patterns persisted even after controlling for level of education and employment. Wilson and Kuha (2018) found that fertility levels of immigrants' descendants are more similar to that of natives if they have grown up in an area which is less residentially segregated. Residential segregation explained some high fertility among women of Pakistani and Bangladeshi descent providing indirect evidence for the importance of cultural factors.

Similar patterns were found across Europe. First, overall fertility levels of non-Western immigrants are higher than that of natives (Kulu et al., 2017). For example, Turkish and Sub-Saharan African immigrants in France; Turkish, Moroccan and Italian immigrants in Belgium; Turkish immigrants in Germany; immigrants from Latin America and the Maghreb region in Spain; and Albanian, Moroccan, and Romanian immigrants in Italy all have higher first birth rates than their native counterparts (Milewski, 2007; Garssen & Nicolaas, 2008; Milewski, 2010b; Mussino & Strozza, 2012a, 2012b; González-Ferrer et al., 2017; Kulu et al., 2017; Pailhé, 2017; Van Landschoot et al., 2017). These patterns persist after controlling for educational differences between the groups. The risk of a second and third birth is relatively high among immigrants from the Maghreb region and Turkey in France, from Morocco and Turkey in Belgium (Kulu et al., 2017), and from the Maghreb region in Spain (González-Ferrer et al., 2017). Interestingly, immigrant women (except those from high-income countries) in Spain have lower second-birth rates than native Spanish women (González-Ferrer et al., 2017).

Second, although fertility differences tend to be smaller between the descendants of immigrants and natives, significant differences persist in most European countries. Among the second generation in Europe, first-birth rates are either similar to or somewhat lower than that of the natives (Kulu et al., 2017; Puur et al., 2017). In Sweden, descendants of immigrants from most origin groups have depressed first- and second-birth rates compared to Swedish natives; however, the risk of a third birth is high among many groups (Andersson et al., 2017). The patterns are somewhat different in Switzerland: immigrants have higher first-birth risks than the natives, whereas second-birth risks are lower among both immigrants and their descendants from all origin countries (Rojas et al., 2018).

Finally, there are fewer differences between the fertility levels of natives and immigrants and their descendants from other European and Western countries. The descendants of European immigrants in Sweden have similar or lower first-birth levels as Swedish women (Scott & Stanfors, 2011). Immigrants from Southern Europe in Germany have similar levels of fertility to that of native Germans (Milewski, 2007, 2010b), whereas second-generation Southern European women in Belgium have lower second- and third-birth rates than the natives (Van Landschoot et al., 2017).

To summarise, existing evidence on the competing explanations on why immigrants' partnership and fertility behaviour may differ from that of the natives is mixed. Immigrants from European and Western countries exhibit partnership and fertility patterns similar to that of the natives. This might either be because partnership and fertility patterns are also similar in their country of origin, supporting the socialisation hypothesis, or because many of them are married to natives (who influence their partnership and fertility behaviours) supporting the adaptation hypothesis. When comparing immigrants from countries with conservative family patterns to the natives (e.g., Turkey, South Asia and North Africa), most studies have found that immigrants from these countries have higher fertility, higher marriage rates, and lower

rates of cohabitation and separation than the natives supporting the socialisation hypothesis. The evidence is less clear when studying the family behaviours of immigrants from other non-European countries (e.g., countries of Africa, Latin America, and the Caribbean).

Regarding the partnership and fertility behaviours of the second generation, studies have shown that the descendants of European immigrants exhibit family behaviours similar to the natives. By contrast, for Turkish, South Asian, and North African groups, patterns of union formation and fertility among the second-generation are more similar to that of the first-generation than to that of natives, supporting the minority subculture hypothesis. At the same time, divorce levels of the second-generation groups were in-between that of the first-generation and the natives (Pailhé, 2015; Hannemann et al., 2020) providing partial support for the adaptation (or assimilation) hypothesis.

The UK context

The economic recovery and growth during the 1950s and 1960s attracted immigrants from the New Commonwealth countries such as the Caribbean as well as India, Pakistan, and Bangladesh (Dale & Ahmed, 2011; Dubuc, 2012). Due to the introduction of severe restrictions on entry to Britain from the Asian subcontinent in 1962, many immigrants decided to settle in the UK (Dale & Ahmed, 2011) and the migration flows of the 1960s were characterised by family reunification (Coleman & Dubuc, 2010; Dale & Ahmed, 2011; Dubuc, 2012). In the 1970s, immigration from the Caribbean countries started to decline, whereas immigration from the Sub-Saharan African region increased (Coleman & Dubuc, 2010; Dubuc, 2012). More recently, many migrants have arrived from China and from the newly joined countries of the European Union, especially Poland (Dubuc, 2012; Waller et al., 2014; Robards & Berrington, 2016).

The share of ethnic minorities has also increased considerably over time. In the 1991 Census, 7% of the population declared that their ethnicity was non-White. The largest groups identified themselves as being of Indian, Caribbean, Pakistani, Chinese, and Bangladeshi origin. By 2011, the share of ethnic minorities has increased to 20%. In 2020, most non-UK-born individuals were from India, Poland, Pakistan, Romania, and the Republic of Ireland (Office for National Statistics, 2020).

Partnership formation and dissolution patterns have changed remarkably over the last few decades across high-income countries, including the UK, and so have fertility levels and timing. This implies that the interrelationship between partnership and fertility has also changed over time. For example, an increasing share of first unions start as cohabitation (Ermisch & Francesconi, 2000), more children are born to cohabiting parents (Perelli-Harris et al., 2010), and divorce and repartnering rates have increased leading to the emergence of multi-partner fertility and complex families (Thomson et al., 2012; Thomson, 2014). Family behaviour in the origin countries of many immigrants differ from that in the UK (Hannemann & Kulu, 2015). For example, South Asian countries are still characterised by very high levels of marriage and low levels of extra-marital childbearing (Alexander et al., 2006). By contrast, in the Caribbean region, low marriage rates and high repartnering rates are prevalent and childbearing often precedes union formation (Berrington, 1994; Miner, 2003).

There is also considerable variation in partnership and fertility behaviours across European countries. For example, while Northern and Western European countries have often been the forerunners of new demographic behaviours, Southern European countries are characterised by low divorce rates, high marriage rates, and low fertility (Billari & Kohler, 2004). However, overall, partnership and fertility patterns across Europe are more similar to the patterns in the UK than to those in many non-European countries (Hannemann & Kulu, 2015).

Expectations

First, we expect that the link between partnerships and fertility among immigrants and their descendants from culturally similar origin countries (Europe and Western countries) will be similar to that among UK natives. We expect similar propensities of having children whilst unpartnered and within cohabitation or marriage, as well as similar levels of cohabitation, marriage (both direct marriage and marriage preceded by cohabitation), and separation.

Second, we expect that the link between partnerships and fertility among immigrants and their descendants from more conservative countries (South Asia) will be stronger than among the natives. This means very little cohabitation, extra-marital childbearing, separation, and higher levels of fertility within marriage than among the natives.

Third, we expect that the link between partnerships and fertility among immigrants and their descendants from the Caribbean region will be weaker than among the natives. This implies higher levels of extra-marital childbearing, cohabitation, and separation, than among the natives.

Fourth, when comparing the family and fertility behaviours of the first and second generation, we expect to observe a convergence to the behaviour of the natives. More precisely, we expect that the link between the partnerships and fertility behaviours of second-generation immigrants will be in-between that of natives and immigrants. We expect this to be especially the case for immigrants from culturally similar countries (e.g., Europe and Western countries) and to a smaller extent among those from culturally dissimilar countries (e.g., South Asia).

Finally, the link between the partnership and fertility histories of individuals is expected to be weaker among younger than older birth cohorts. Younger birth cohorts of all origin groups are expected to be more likely to experience non-traditional partnership and family behaviours, such as cohabitation, separation, and childbearing within cohabitation. We expect to observe

some changes across birth cohorts in all migrant groups and generations, although we expect this to be especially the case among the second generation.

Data and Sample

We used data from 9 waves (2009–2019) of the UK Household Longitudinal Study (UKHLS), also called Understanding Society (University of Essex, 2020b). The UKHLS is a large, nationally representative, longitudinal panel survey of households in the United Kingdom. All adult household members are interviewed annually about topics including partnerships, fertility, employment, education, income, housing, and health. The UKHLS contains retrospective partnership and fertility histories including the start and end dates (year and month) of unions and the dates (year and month) of childbirths collected in wave 1 or when respondents were interviewed for the first time (in the latter case only partial partnership histories were collected). Additionally, the panel waves provide prospective information on changes in partnership status and the birth of (additional) children since last interview (Nandi et al., 2020). We have used the Marital and Cohabitation Histories file (University of Essex, 2020a), which combines and harmonises information on partnership experiences from the retrospective histories and the panel waves.

The UKHLS provides an exceptional opportunity to study the lives of immigrants and their descendants in the United Kingdom. It contains two boost samples, where ethnic minorities were oversampled from high ethnic minority concentration areas to ensure a larger sample size than would be expected otherwise. First, the data collection in wave 1 was supplemented with an ethnic minority boost sample (EMB) of over 4,000 households. It was designed such that at least 1,000 adult interviews would be available for each of the five main ethnic groups (Indian, Pakistani, Bangladeshi, Caribbean, and African). Second, in wave 6, an additional immigrant and ethnic minority boost sample (IEMB) of around 2,900 households

was added to refresh the EMB sample and to provide a sample of immigrants from other origin groups (McFall et al., 2019). These boost samples together with ethnic minorities in the main sample allow a detailed analysis of immigrants and their descendants and comparisons across different migrant origin groups.

Employment histories are available for those respondents who have ever left full-time education albeit only for a subset of individuals. Employment histories were collected in wave 1 for those who were interviewed in months 1-6 of the 24-month data collection period and in wave 5 for those who were interviewed in months 7-24. This means that employment histories are not available for the IEMB sample (introduced in wave 6), for those who entered the study after wave 1, and who were not eligible to provide employment histories in wave 1 but left the survey before wave 5. For individuals who never left full-time education, we assume that their employment history consists of being in full-time education since age 16. Taken together, we have information on employment histories for 67% of individuals in the analytical sample. In addition to the retrospective employment histories, the panel waves provide prospective information on changes in employment status.

UKHLS collected information on about 30,000 households corresponding to around 51,000 individuals. The analytical sample used in this study is restricted to women¹, who were born after 1940, who were at least 16 years old at the time of the interview, who were original or permanent sample members, and who completed a full interview in wave 1. We have removed women who had a first birth or first union before age 16 (549 cases), who had missing information on the year of the birth of their first child (228 cases) and for whom information on both the mother's and the father's country of origin (29 cases) was missing. The resulting sample size used in the analyses is 27,943 women. We refer to this sample as the 'full sample'.

¹ We have replicated the analyses for men (see Appendix Figures A1 to A3) and found similar patterns to that of women.

To account for the role of employment status in the analyses, we rely on a restricted sample, which we refer to as the ‘employment sample’ (18,671 women); this contains individuals for whom employment histories were collected.

Data quality

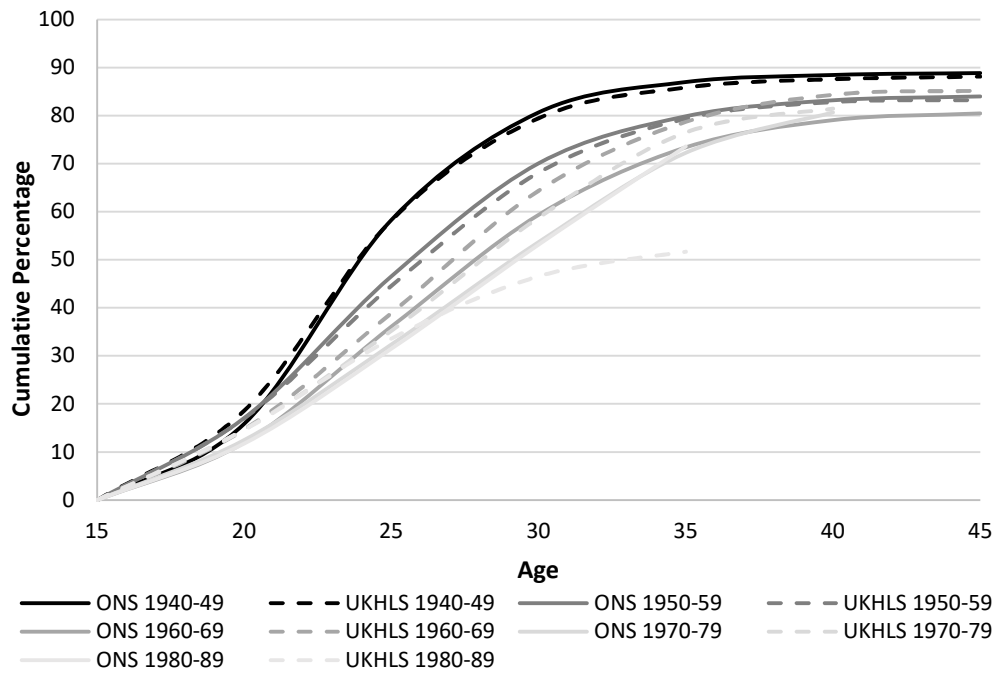
To assess the quality of the retrospective partnership and fertility histories, we have calculated basic partnership and fertility measures from UKHLS and compared these with those published by the Office for National Statistics (ONS). These measures are only calculated for England and Wales to ensure comparability with the ONS estimates. Following Hannemann and Kulu (2015) and Kulu and Hannemann (2016b), we calculated the following measures: the cumulative percentage of ever married, ever cohabiting, ever divorced, and ever repartnered women by age and birth cohort (marriage cohort in case of divorce); and the cumulative percentage of women who ever had a child as well as the mean number of children by age and birth cohort. The estimates from UKHLS are weighted using the first available cross-sectional weight for each individual. The results of these comparisons are shown in Appendix Table A1. We highlight the results on the cumulative percentage of women who ever had a child (Figure 1) and of ever married women (Figure 2).

Comparing the fertility indicators from the UKHLS with those provided by the ONS, we find that the estimates are highly comparable for all cohorts except the youngest cohort (1980-89) for which the UKHLS substantially underestimates both the cumulative proportion of women who ever had a child and the average number of children after age 25 and age 30, respectively. More detailed investigation (now shown) revealed that the estimates are comparable up to age 30 for those born between 1980-84 and up to age 25 for those born between 1985-89.

Similarly, comparing data from the UKHLS and ONS on indicators of partnership formation and dissolution reveals that the estimates from the two data sources are highly comparable. There are some inconsistencies among the youngest marriage cohort (1995-2004); the UKHLS substantially underestimates the proportion of ever divorced women in this marriage cohort after about 10 years of marriage. The ONS does not provide official statistics on the proportion of women who ever cohabited. Therefore, we compare our estimates to those from previously published studies. For example, Murphy (2000) reported for Britain that by age 45, 18% of women born between 1940-49 have ever cohabited whereas this proportion was 38% among those born between 1950-59. Our estimates are 20% and 42%, respectively. Furthermore, Murphy (2000) calculated that by age 30, 45% of women born between 1960-64 and 60% of those born between 1965-69 have ever cohabited. On average, this means that 53% of women born in the 1960s have experienced a cohabitation by age 30; our estimate is 54%.

To summarise, the quality of both partnership and fertility histories in the UKHLS is very high; our weighted estimates from UKHLS are comparable to and consistent with those provided by the ONS and previous studies (where ONS data are not available). We account for the detected inconsistencies among the youngest (marriage) cohort by censoring observations at younger ages in the analyses (see Methods and Analytical Strategy section).

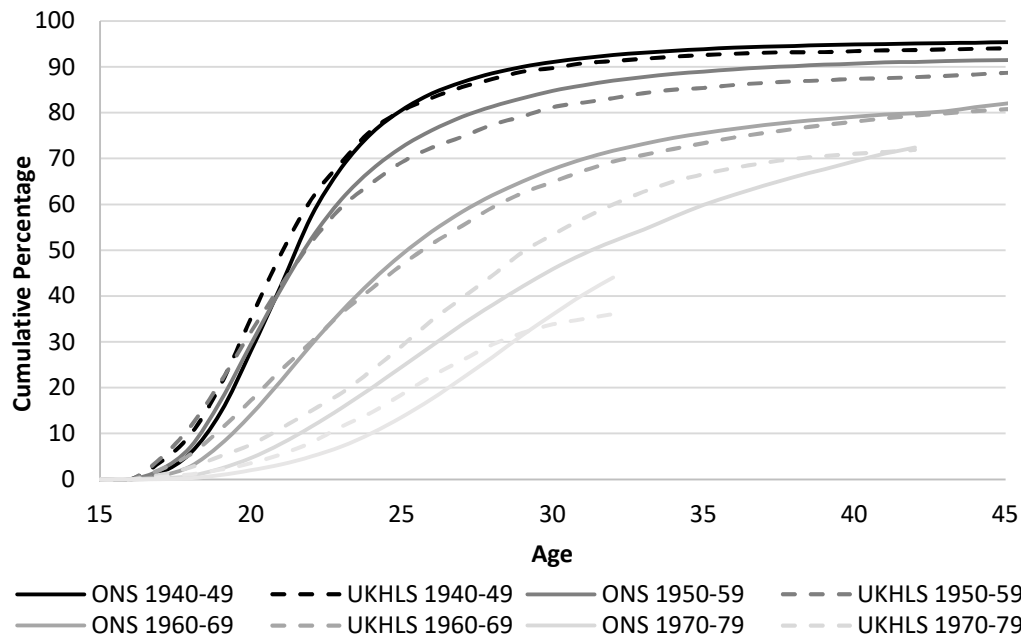
Figure 1. Cumulative percentage of women who ever had a child in England and Wales by age and birth cohort: comparison of weighted UKHLS and ONS data



Notes: The estimates from UKHLS are weighted using the first available cross-sectional weight for each individual.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS) and Office for National Statistics (www.ons.gov.uk) fertility records.

Figure 2. Cumulative percentage of ever married women in England and Wales by age and birth cohort: comparison of weighted UKHLS and ONS data



Notes: The estimates from UKHLS are weighted using the first available cross-sectional weight for each individual.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS) and Office for National Statistics (www.ons.gov.uk) marriage records.

Methods and Analytical Strategy

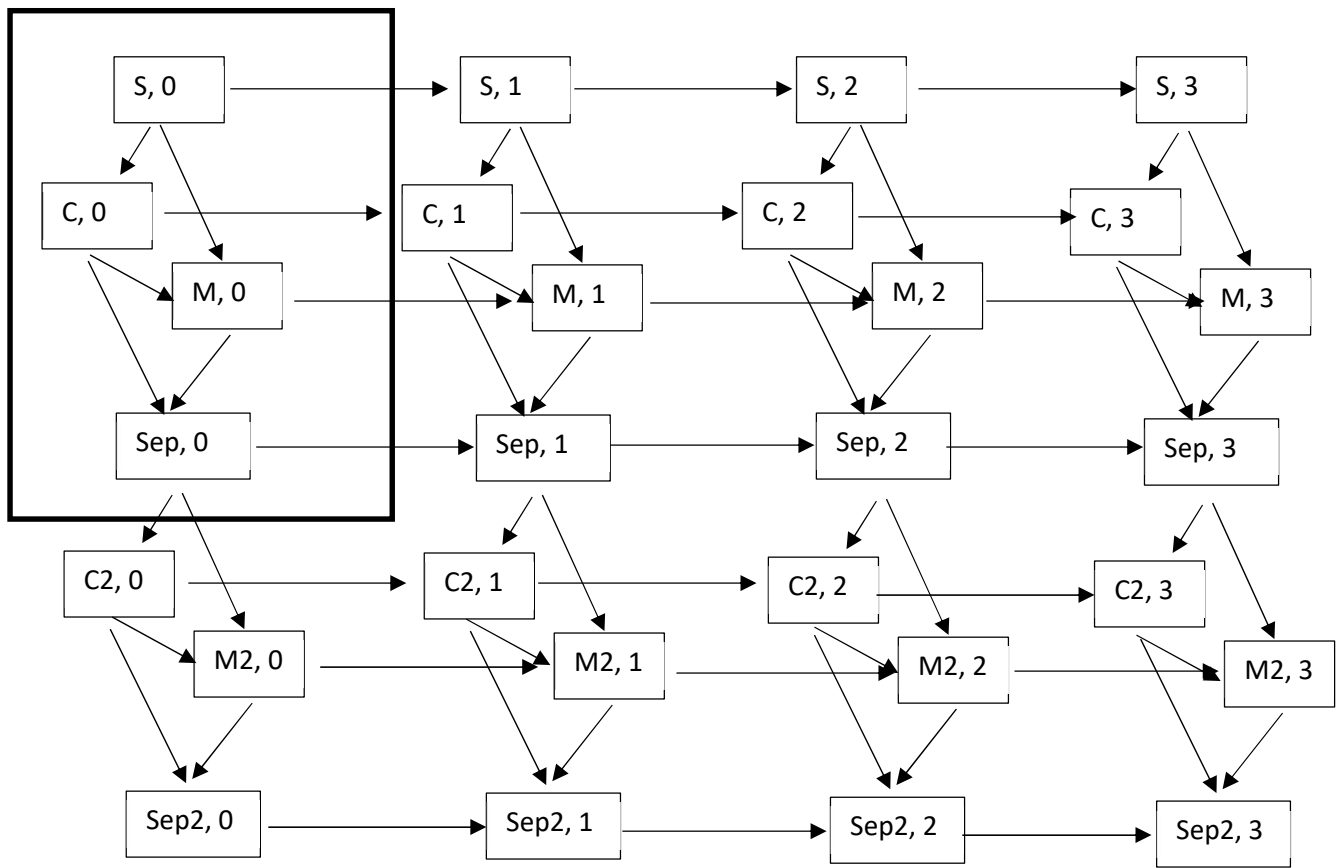
To study changes in partnership status and parity simultaneously across individuals' life courses, we estimate multi-state event history models. These models are an extension of conventional event history models: rather than analysing a single partnership or fertility transition, individuals move among different states as they age (Putter, 2011; Mikolai & Lyons-Amos, 2017; Mikolai et al., 2018). Figure 3 shows the state space (boxes) and the possible transitions (arrows) between the states. Each box shows a combination of partnership status and parity. For example, the state 'S,0' represents never partnered childless individuals; the state 'C2,3' represents individuals who are in a second union which is a cohabitation and have three children.

We start observing individuals at age 16 when they are never partnered (i.e., single) and childless (see box in the upper left corner of Figure 3). Single and childless (S, 0) individuals can either form a cohabiting relationship ($S, 0 \rightarrow C, 0$), marry directly ($S, 0 \rightarrow M, 0$), or have a first child ($S, 0 \rightarrow S, 1$). Once cohabiting, individuals can either marry their partner ($C, 0 \rightarrow M, 0$), separate ($C, 0 \rightarrow \text{Sep}, 0$), or have a child ($C, 0 \rightarrow C, 1$). Finally, married individuals can either separate from their spouse ($M, 0 \rightarrow \text{Sep}, 0$) or have a child ($M, 0 \rightarrow M, 1$).

These transitions can be repeated; for example, women who had a child can have additional children and those who experienced separation can form a new (cohabiting or marital) relationship. The remaining parts of Figure 3 (i.e., outside the box) show these repeated transitions². Moving to the right from the box in the upper left corner of Figure 3, we depict transitions to higher order births, whereas moving downwards, we depict transitions to higher order unions.

² Figure A4 in the Appendix shows the number of women who experienced each transition on Figure 3 in the analytical sample.

Figure 3. Schematic representation of repeated partnership and fertility transitions



Notes: S – never partnered; C – cohabitation; M – marriage; Sep – separation; C2 – second union which is cohabitation; M2 – second union which is marriage; Sep2 – second separation; the numbers 0–3 represent women’s parity (i.e., 0 child, 1 child, 2 children, and 3 children).

Given that individuals can experience many transitions, we face three key challenges to jointly analyse partnership and fertility transitions among natives, immigrants, and their descendants: 1) how to model several types of partnership and fertility outcomes, 2) how to account for repeated partnership and fertility transitions, and 3) how to include both the role of age and time since previous partnership and/or fertility transition in the models. Below, we outline how our innovative multi-state modelling strategy solves these challenges.

First, to study the risk of several types of partnership and fertility outcomes, we estimate three sets of competing-risks models for the outcomes of: 1) never partnered, 2) cohabiting, and 3) married women. These models have the following specification:

$$\ln \mu_i^k(t) = \ln \mu_0(t) + \sum_j \alpha_j x_{ij} + \sum_l \beta_l w_{il}(t) + \gamma z_i \quad (1)$$

where μ_i^k is the risk of experiencing a transition of type k for individual i . Among single women, this refers to the risk of experiencing a cohabitation, marriage, or childbirth; among cohabiting women, it refers to the risk of marriage, separation, or childbirth; and among married women, it denotes the risk of separation or childbirth. $\ln \mu_0(t)$ is the baseline log-hazard, which is specified as piecewise constant. x_{ij} represents time-constant and w_{il} time-varying variables. These models could be estimated separately for each outcome by estimating an event history model where individuals are censored if they experience a competing event. However, this would not only lead to the estimation of many models, but it would also be difficult to directly compare the risk of each competing outcome to each other and to assess their relative importance. Therefore, we model competing outcomes simultaneously using an extended dataset where each individual has k records, corresponding to the number of competing transitions in each set of competing risks models (Cleves et al., 2016). z_i denotes an interaction term between migrant origin and the type of partnership/fertility transition and γ is the parameter to measure its effect. The model assumes a common baseline (or age pattern) for all partnership and fertility transitions, but the risk of each transition can vary by migrant origin. This allows us to estimate the risk of each partnership/fertility transition for individuals from different migrant origins. For all transitions, the baseline is an individuals' age in months.

Second, individuals can experience these competing partnership and fertility transitions several times across their life course. To model such repeated transitions, it is possible to estimate separate models for each set of transitions of each order. However, this would lead to many models and inefficient estimates for higher order unions and births due to small risk populations and number of events. Instead, we extend the competing-risks model (Equation 1)

to a multi-level setup to analyse repeated partnership and fertility transitions. The multi-level competing-risks event history model is specified in the following way:

$$\ln \mu_{im}^k(t) = \ln \mu_0(t) + \sum_j \alpha_j x_{ijm} + \sum_l \beta_l w_{ilm}(t) + \gamma z_{im} + \varepsilon_i \quad (2)$$

where μ_{im}^k is the risk of experiencing a transition of type k of order m (first or higher order) for individual i ; ε_i is the individual-level random effect to adjust for the nested structure of the data (transitions are nested within individuals). Thus, we have developed a multi-level multi-state event history model, where we analyse the outcomes of: 1) unpartnered (denoting both never partnered and separated single individuals), 2) cohabiting, and 3) married women controlling for time-varying union/separation order and parity.

Third, most applications of multi-state models in demography only use one ‘clock’ (usually age). But for life events such as separation or second and subsequent births and unions, union duration or time since previous event (i.e., separation or birth) are critical in addition to individuals’ age. In our modelling strategy, we use individuals’ age in months as the baseline, but we also account for other ‘clocks’ (i.e., for transitions out of cohabitation and marriage, we include cohabitation/marriage duration respectively, and for second and higher order union/parity transitions, we include time since separation/previous birth). The model then becomes as follows:

$$\ln \mu_{im}^k(t) = \ln \mu_0(t) + \sum_j \alpha_j x_{ijm} + \sum_l \beta_l w_{ilm}(t) + \delta u_{im}(t) + \tau y_{im}(t) + \gamma z_{im} + \varepsilon_i \quad (3)$$

where $u_{im}(t)$ denotes a time-varying variable of union order, which also includes categories to measure time since separation or union duration and y_{im} denotes an equivalent variable for birth order and time since previous birth.

To summarise, we have developed a multi-level multi-state event history model to analyse competing transitions out of three key states (unpartnered, cohabitation, and marriage) repeatedly whilst controlling for union order and parity as well as union duration and time since separation/previous birth. In our application, we simplify the proposed multi-level multi-state model: we correct standard errors of the parameter estimates to account for the nested structure of the data instead of including an individual-level random effect in the model.

Individuals are observed from age 16 until age 50, widowhood, the time of a twin birth, or the time of their last interview. Given some data quality issues for the youngest cohort, individuals born between 1980-84 are censored at age 30, those born between 1985-1989 at age 25 and those born after 1990 at age 20 if they are older than 20 at the time of the interview.

In the first part of the analysis, we estimate four models stepwise. First, we fit the three sets of competing risks models with age, birth cohort, migrant origin, and the relevant duration and union/birth order variables³ (Model 1). Then, we control for level of education (Model 2a). These two models are estimated using the full sample. To also control for employment status, we re-estimate Model 2a on the employment sample (Model 2b) and then control for employment status (Model 3). In the main body of the paper, we present results from Model 2a, and briefly discuss the robustness of our results when also controlling for employment status (Models 2b and 3). These results are available in the Appendix (Tables A3-A5).

In the second part of the analysis, we re-estimate Model 2a but instead of controlling for birth cohort, we estimate three-way interaction effects between type of transition, migrant origin, and birth cohort to study whether and how the link between partnership and fertility has changed across birth cohorts among the first and second generation.

³ We have also explored whether the risk of first and higher order partnership and fertility transitions is the same across different migrant origin groups by including interaction effects between union order and migrant origin as well as between birth order and migrant origin (results not shown). We found that the patterns of the effect of union order and birth order on the risk of the analysed partnership and fertility transitions is the same across different migrant origin groups. Thus, we concluded that repeated partnership and fertility transitions can be analysed by allowing for repeated events within individuals and controlling for union order and birth order.

The UKHLS has a complex sample design and the minority boost samples come from areas with high ethnic minority concentration. Therefore, it is important to use weights and to account for the sampling strategy to provide unbiased population estimates (McFall et al., 2019). However, the use of cross-sectional or longitudinal weights is not possible in event history analysis where retrospective and prospective information is combined. Additionally, it is not currently possible to incorporate clustered standard errors at both the individual level (which is essential as we study repeated events) and the level of the primary sampling unit (i.e., area). For all these reasons, we present unweighted results. Nonetheless, we have conducted additional analyses using the first available cross-sectional weight for each individual provided in the UKHLS (see Appendix Figures A11-A13) and explored models where we have adjusted the standard errors for clustering within primary sampling units (results not shown). Although standard errors become larger in the weighted analyses as expected, the patterns and the conclusions of the study remain identical.

Variables

To determine the *migrant origin* of individuals, we use information on their own as well as their mothers' country of birth. If information on individuals' (5 cases) or their mother's (54 cases) country of birth is missing, we impute these using information from their self-reported ethnicity. If the mother is UK-born (1693 cases), or if the mother's country of birth is missing (17 cases), we use information from the father's country of birth. If the respondent is UK-born and information on the country of birth of both parents is missing (57 cases) or it is only available for one UK-born parent (1156 cases), we use information on individuals' own ethnicity.

We define natives as those who were born in the UK and whose parents were also born in the UK. Immigrants are those who were born outside the UK. Descendants of immigrants

(i.e., the second generation) are those who were born in the UK but at least one of their parents was born outside the UK. We also distinguish between different origin groups. We compare the experiences of groups from Europe and other Western nations (Australia, New Zealand, Canada, USA), India, Pakistan, Bangladesh, Caribbean, African countries, and other countries (including China, Sri Lanka, and other countries).

Age is the baseline and is categorised in 5-year age groups: 16-19, 20-24 (reference), 25-29, 30-34, 35-39, 40-44, and 45-49. In addition, we adjust the analysis for *union order and duration* as well as *birth order and duration*. The specification of these variables varies across the three sets of competing risks models. For the first model (outcomes of unpartnered individuals), we control for time since previous separation (no separation (reference), 0-1 year, 1-3 years, 3-5 years, and 5 or more years) and the order of separation (separated once (reference) vs. separated two or more times). To model the outcomes of cohabitations and marriages, we control for cohabitation and marriage duration, respectively (0-1 year (reference), 1-3 years, 3-5 years, and 5 or more years) as well as union order (first union (reference) vs. second or higher order union). All three competing risks models are also adjusted for time since previous birth (no birth (reference), 0-1 year, 1-3 years, 3-5 years, and 5 or more years) and birth order (less than two children (reference) vs. two or more children).

In addition, we control the analysis for several other factors. *Birth cohort* is divided into three groups: those born between 1940 and 1959 (reference); between 1960 and 1979, and between 1980 and 2003. To control for the *level of education*, we created a time-varying categorical variable measured as high (university degree), medium (A level or higher degrees), or low (less than completed A levels or higher degrees) (reference) level of education. Using information on the age at which respondents left school and full-time education, we calculate the time at which individuals' level of education has changed. If this information is not available, following Kulu and Hannemann (2016b) and in line with the British educational

system, we have imputed the age of completion of medium level of education as age 18 and of high level of education as age 21.

Employment status is a time varying variable and is measured using the following categories: full-time employed (reference), part-time employed, self-employed, in full-time education, unemployed, and other (retired, maternity/paternity leave, looking after family or home, long-term sick or disabled, on a government training scheme). The time of change in employment status is reported by the respondents in the employment histories as well as panel waves. As mentioned before, retrospective employment histories are only available for 67% of the analytical sample.

Results

Descriptive results

Table 1 shows the number and proportion of person-months, and partnership and fertility events by migrant origin among women in the UK. Appendix Table A2 shows these statistics by the categories of all other variables included in the analysis. Natives contribute the largest share of person-months and the largest number of events across all three sets of competing risks models. Nonetheless, we have a sufficient number of events within each migrant group to conduct detailed analyses on their partnership and fertility transitions. Among unpartnered women of Bangladeshi origin, very few experience cohabitation and, consequently, even fewer experience any of the three cohabitation outcomes. To ensure that we have a sufficient number of events among all groups, we have merged women of Pakistani and Bangladeshi origin into one group when analysing the outcomes of cohabitations.

Table 1 Numbers and proportions of person-months, and partnership and fertility events in the UK by migrant origin and generation, women

Outcomes of unpartnered women			
Person-months	Cohabitation	Marriage	Birth

	N	%	N	%	N	%	N	%
<i>Natives</i>	2008893	61.3	11581	75.5	7395	60.2	3512	57.6
<i>Immigrants</i>								
Europe and Western countries	135508	4.1	709	4.6	401	3.3	158	2.6
India	74967	2.3	49	0.3	584	4.8	74	1.2
Pakistan	64905	2.0	18	0.1	580	4.7	104	1.7
Bangladesh	32842	1.0	5	0.0	396	3.2	57	0.9
Caribbean countries	43938	1.3	119	0.8	78	0.6	214	3.5
African countries	103129	3.1	222	1.4	366	3.0	271	4.4
Other countries	338400	10.3	987	6.4	1176	9.6	762	12.5
<i>Descendants of immigrants</i>								
Europe and Western countries	121874	3.7	635	4.1	354	2.9	214	3.5
India	54549	1.7	105	0.7	271	2.2	54	0.9
Pakistan	47891	1.5	28	0.2	302	2.5	75	1.2
Bangladesh	24815	0.8	10	0.1	74	0.6	19	0.3
Caribbean countries	74788	2.3	282	1.8	63	0.5	270	4.4
African countries	40351	1.2	119	0.8	77	0.6	65	1.1
Other countries	112458	3.4	473	3.1	166	1.4	243	4.0
<i>Total</i>	3279306	100	15342	100	12283	100	6092	100

Outcomes of cohabiting women

	Person-months		Marriage		Separation		Birth	
	N	%	N	%	N	%	N	%
<i>Natives</i>	553634	76.8	5810	77.2	4054	72.8	4221	77.6
<i>Immigrants</i>								
Europe and Western countries	28262	3.9	330	4.4	278	5.0	136	2.5
India	1536	0.2	28	0.4	12	0.2	14	0.3
Pakistan	693	0.1	8	0.1	<5	0.1	<5	0.1
Bangladesh	152	0.0	<5	0.1	<5	0.0	<5	0.0
Caribbean countries	5486	0.8	63	0.8	41	0.7	67	1.2
African countries	8963	1.2	109	1.4	77	1.4	97	1.8
Other countries	39467	5.5	474	6.3	357	6.4	297	5.5
<i>Descendants of immigrants</i>								
Europe and Western countries	31859	4.4	311	4.1	221	4.0	220	4.0
India	4581	0.6	47	0.6	53	1.0	23	0.4
Pakistan	1165	0.2	12	0.2	16	0.3	13	0.2
Bangladesh	250	0.0	8	0.1	<5	0.0	<5	0.0
Caribbean countries	16214	2.2	87	1.2	167	3.0	169	3.1
African countries	5068	0.7	44	0.6	62	1.1	35	0.6
Other countries	23529	3.3	189	2.5	221	4.0	143	2.6
<i>Total</i>	720859	100	7524	100	5565	100	5442	100

Outcomes of married women

	Person-months		Separation		Birth	
	N	%	N	%	N	%
<i>Natives</i>	2347500	69.1	4042	75.0	18453	63.0
<i>Immigrants</i>						
Europe and Western countries	110306	3.2	143	2.7	982	3.4
India	117030	3.4	54	1.0	1051	3.6
Pakistan	111493	3.3	75	1.4	1490	5.1
Bangladesh	76021	2.2	40	0.7	1034	3.5
Caribbean countries	22213	0.7	53	1.0	157	0.5
African countries	79238	2.3	101	1.9	746	2.5
Other countries	245888	7.2	334	6.2	2492	8.5
<i>Descendants of immigrants</i>						
Europe and Western countries	110336	3.2	231	4.3	902	3.1

India	52934	1.6	49	0.9	544	1.9
Pakistan	35600	1.0	73	1.4	528	1.8
Bangladesh	9129	0.3	11	0.2	133	0.5
Caribbean countries	17541	0.5	51	0.9	138	0.5
African countries	14907	0.4	28	0.5	157	0.5
Other countries	48123	1.4	107	2.0	463	1.6
<i>Total</i>	3398258	100	5392	100	29270	100

Notes: Unpartnered women refer to never partnered and/or separated women. Following Office for National Statistics guidelines for statistical disclosure, we do not disclose the number of events where this is less than 5.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Table 2 shows the number and proportion of women by migrant origin in the full and the employment sample for the outcomes of unpartnered, cohabiting, and married women. First, natives represent the largest share of the sample; we also have a sufficient number of observations for each migrant group. Additionally, comparing the distribution of different migrant groups in the two samples, we find that these are comparable for all three sets of outcomes.

Table 2 Number and proportion of women by migrant origin and generation in the full sample and the employment sample for each set of competing risks models

	Outcomes of unpartnered women				Outcomes of cohabiting women				Outcomes of married women			
	Full sample		Employment sample		Full sample		Employment sample		Full sample		Employment sample	
	N	%	N	%	N	%	N	%	N	%	N	%
<i>Natives</i>	17576	62.9	12984	69.5	8644	75.1	6201	78.9	11220	65.0	8303	73.1
<i>Immigrants</i>												
Europe and Western countries	1101	3.9	587	3.1	535	4.6	278	3.5	665	3.9	353	3.1
India	698	2.5	317	1.7	45	0.4	23	0.3	583	3.4	263	2.3
Pakistan	657	2.4	223	1.2	18	0.2	9	0.1	550	3.2	195	1.7
Bangladesh	445	1.6	160	0.9	<5	0.0	<5	0.0	392	2.3	164	1.4
Caribbean countries	223	0.8	103	0.6	99	0.9	51	0.6	126	0.7	54	0.5
African countries	688	2.5	351	1.9	184	1.6	92	1.2	437	2.5	212	1.9
Other countries	2560	9.2	1286	6.9	776	6.7	408	5.2	1520	8.8	718	6.3
<i>Descendants of immigrants</i>												
Europe and Western countries	911	3.3	654	3.5	464	4.0	328	4.2	569	3.3	418	3.7
India	511	1.8	307	1.6	84	0.7	53	0.7	290	1.7	161	1.4
Pakistan	625	2.2	375	2.0	26	0.2	19	0.2	279	1.6	125	1.1
Bangladesh	337	1.2	250	1.3	10	0.1	5	0.1	80	0.5	42	0.4
Caribbean countries	425	1.5	248	1.3	198	1.7	113	1.4	130	0.8	75	0.7
African countries	344	1.2	220	1.2	81	0.7	50	0.6	109	0.6	57	0.5
Other countries	842	3.0	606	3.2	345	3.0	223	2.8	313	1.8	222	2.0
<i>Total</i>	27943	100	18671	100	11513	100	7855	100	17263	100	11362	100

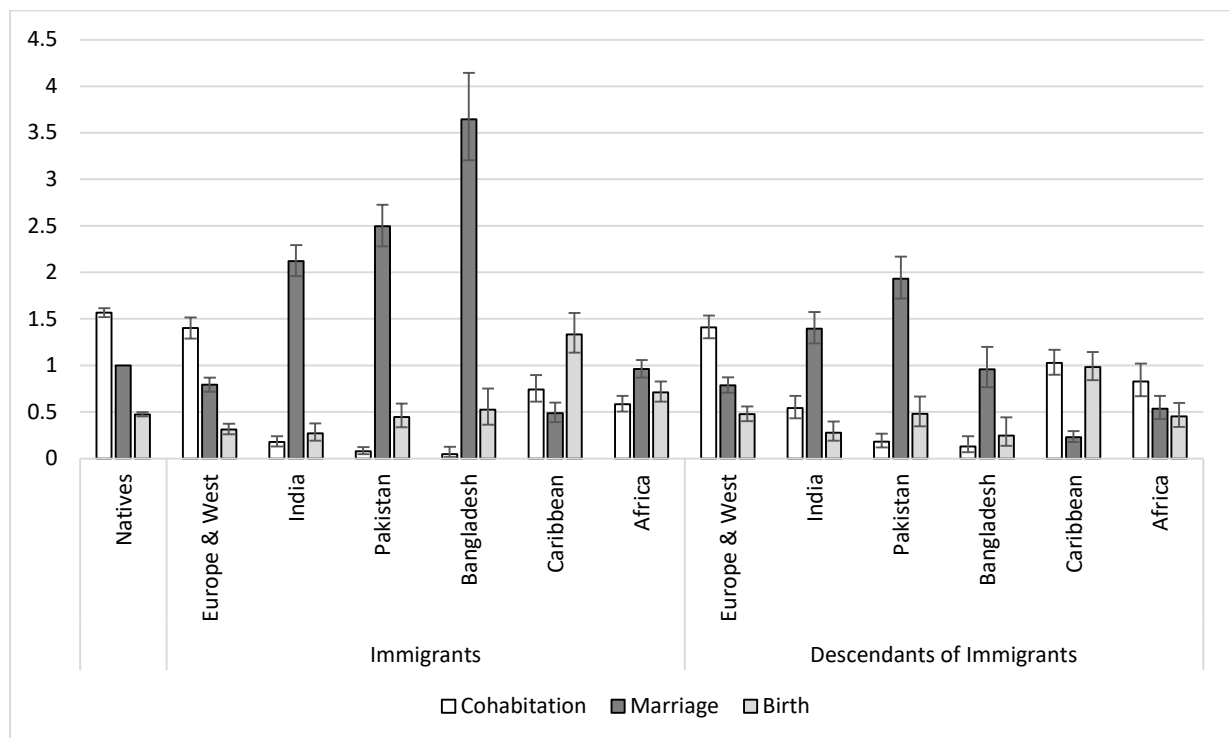
Notes: Unpartnered women refer to never partnered and/or separated women. Following Office for National Statistics guidelines for statistical disclosure, we do not disclose the number of individuals where this is less than 5.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Multivariate results: Outcomes of never partnered, cohabiting, and married women

Figures 4-6 show the relative risks of the competing events among unpartnered, cohabiting, and married women, respectively. We present interaction effects between migrant origin and the type of transition from Model 2a where we control for age, birth cohort, level of education, and the relevant duration and order variables for each process. We do not present results for the ‘Other’ category on the Figures to ease readability. The results of the full models are shown in the Appendix Tables A3-A5⁴.

Figure 4 Outcomes of unpartnered women: Relative risks of cohabitation, marriage, or childbirth in the UK by migrant origin and generation



Notes: Unpartnered women refer to never partnered and/or separated women. Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to marry). The analysis is controlled for age, birth cohort, time since separation, order of separation, time since previous birth, parity, and level of education. Results of the full model are shown in the Appendix (M2a in Table A3).

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

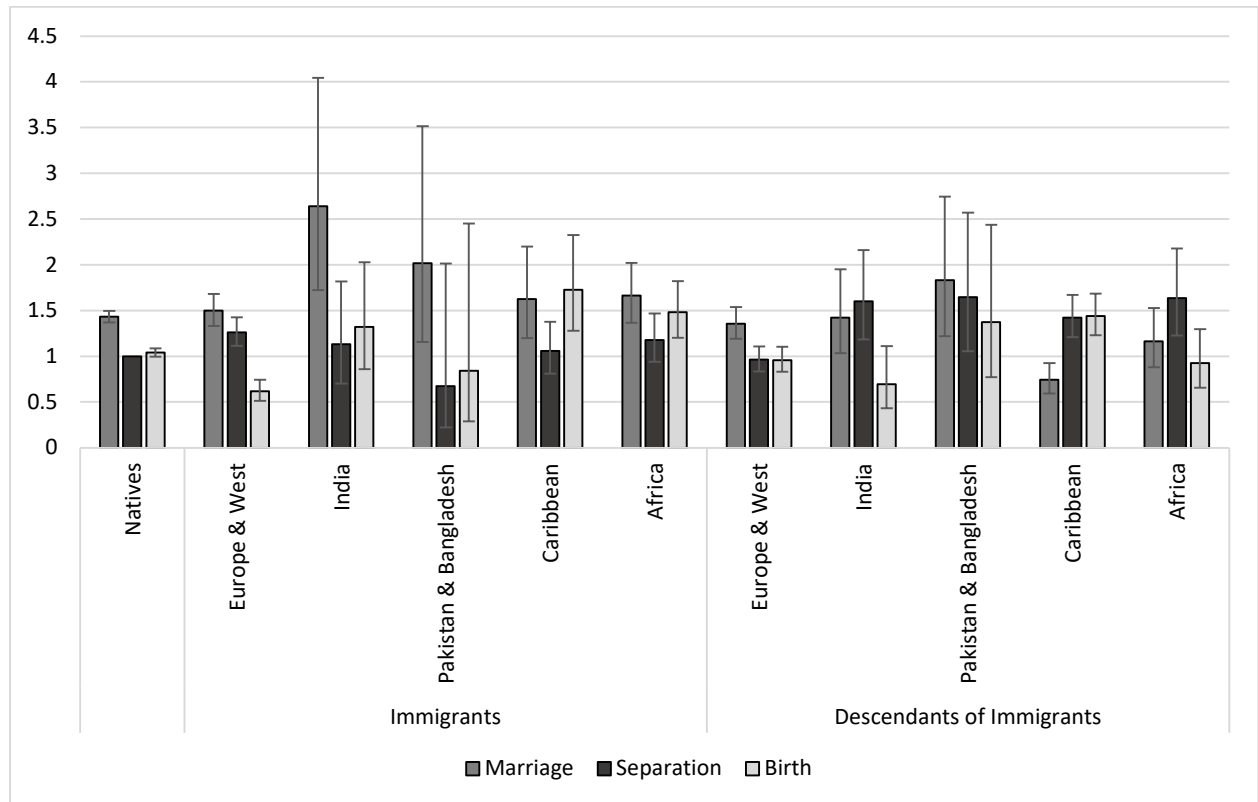
⁴ We present results from Model 2a because compared to Model 1 (which does not yet include level of education), the results are almost unchanged, and the conclusions of the analyses remain the same. For comparison, see Appendix Tables A3-A5.

Figure 4 shows the relative risks of cohabitation, marriage, or childbearing among unpartnered women by migrant origin. The reference category is the hazard of unpartnered natives to marry (denoted by 1); all other hazards are compared to this. Among unpartnered native women, the risk of cohabitation is the highest, followed by the risk of marriage and childbirth. We find similar patterns among women from Europe and Western countries (for both immigrants and descendants). Among South Asian immigrants (India, Pakistan, Bangladesh), a different pattern emerges; women in this group predominantly marry; this is followed by childbirth and cohabitation; the latter is a rare event among immigrant women from these countries. Interestingly, these patterns also hold among the descendants of immigrants. However, we note two differences. First, among second-generation South Asians, the relative risk of marriage has declined compared to that of the first generation. Second, among second-generation Indian women the relative risk of cohabitation is higher compared to that of the first generation. Unpartnered immigrant women from the Caribbean region are most likely to have children, followed by cohabitation and marriage. Among the second generation, the risk of cohabitation is as high as that of childbirth, whereas the risk of marriage is low. The patterns among unpartnered African women change the most across migrant generations. Among immigrants, marriage was the most common outcome, but among the descendants, cohabitation has become the most prevalent.

Figure 5 shows the outcomes of cohabitation (marriage, separation, or childbirth) by migrant origin. The reference category is separation risks for native cohabiting women. Among cohabiting native women, marriage is the most likely outcome followed by childbirth, and separation. Similarly, cohabiting immigrants from European and Western countries tend to marry, followed by separation, and childbirth. Among South Asian immigrants it is not possible to detect any clear patterns; the confidence intervals are large because only very few of these women cohabit in the first place. Nonetheless, marriage seems to be the most common outcome

followed by childbirth and separation. Caribbean and African cohabiting women tend to either marry or have a child; their risk of separation is the lowest.

Figure 5 Outcomes of cohabiting women: Relative risks of marriage, separation, or childbirth in the UK by migrant origin and generation

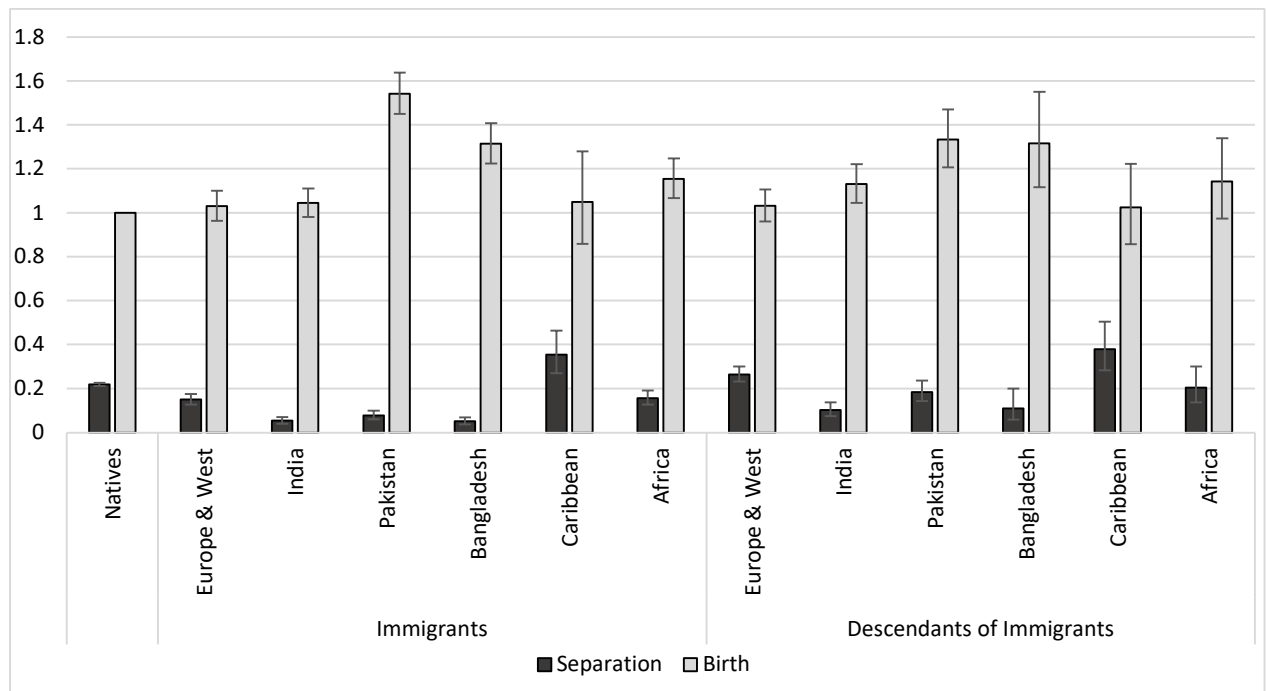


Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to separate). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education. Results of the full model are shown in the Appendix (M2a in Table A4).

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

The patterns are somewhat different among the descendants of immigrants. While second-generation European (and Western) women follow the same trends as their first-generation counterparts, second-generation Indian cohabiting women are most likely to separate (although note the large confidence intervals). Second generation women of Caribbean and African origin also tend to separate, followed by marriage and birth (those from the Caribbean region are equally likely to separate or have a child).

Figure 6 Outcomes of married women: Relative risks of separation or a childbirth in the UK by migrant origin and generation



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to have a child). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education. Results of the full model are shown in the Appendix (M2a in Table A5).

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Finally, Figure 6 shows the relative risks of separation or childbirth among married women by migrant origin and generation. The reference category is the risk to have a(n additional) child among native married women. Generally, married women have the highest risk of childbirth and are considerably less likely to separate among all migrant groups. However, there are some differences in the magnitude of separation and birth rates across migrant groups. Married immigrants from Pakistan and Bangladesh are more likely to have a(n additional) child than married women from all other groups. The birth rates of immigrants from African countries are also somewhat higher than those of natives and European/Western immigrants. However, the birth risks of second-generation African women are comparable to those of other groups of descendants of immigrants. There are also differences in the separation risks. They are the lowest among South Asian immigrants and their descendants, whereas they

are the highest among Caribbean women. Interestingly, separation risks among second-generation South Asian women are higher than among immigrants.

We have estimated an additional model to also adjust the analysis for employment status. As explained earlier, information on employment histories is only available for two-thirds of the analytical sample. To assess whether our findings are robust to controlling for employment status, we first re-estimated Model 2a on the restricted employment sample (Model 2b) and then controlled for employment status (Model 3). Overall, the results of the analysis are very similar to what is presented in Figures 4-6 and the patterns and conclusions remain unchanged after controlling for employment status. For more details on Models 2b and 3, see Appendix Tables A3-A5.

Multivariate results: Change across birth cohorts

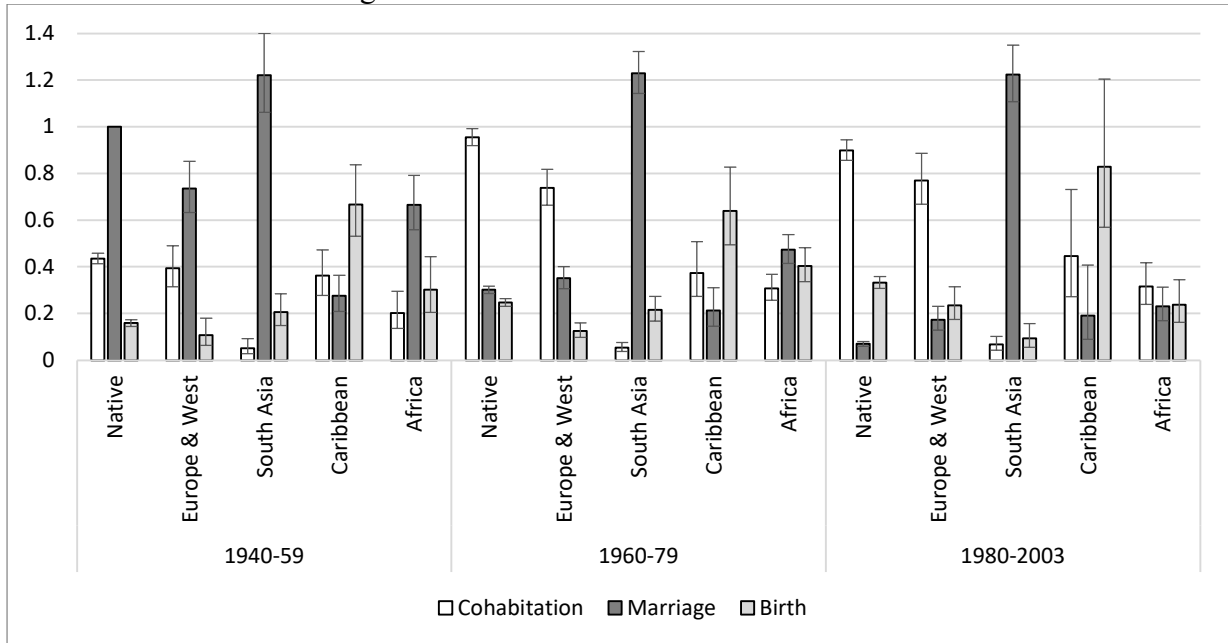
Next, we study whether and how interrelated partnership and fertility patterns of immigrants and their descendants have changed across birth cohorts. We have included a three-way interaction term in the model between type of transition, migrant origin, and birth cohort. To ensure a sufficient number of events across migrant groups and birth cohorts, we have grouped together Indian, Pakistani, and Bangladeshi women, referred to as South Asian countries.

Among unpartnered women, the largest change took place among native women. While among the oldest cohort marriage was the dominant type of first union, among those born in the 1980s and later, cohabitation is the primary way of union formation and direct marriage is rare (Figure 7). These patterns are in line with what we know from the literature. We observe similar patterns among immigrants and their descendants from European and other Western countries. However, and surprisingly, we find very little change across birth cohorts and among women from all other migrant groups. Although direct marriage remains the most common outcome among South Asian women, we observe declining marriage rates among the youngest

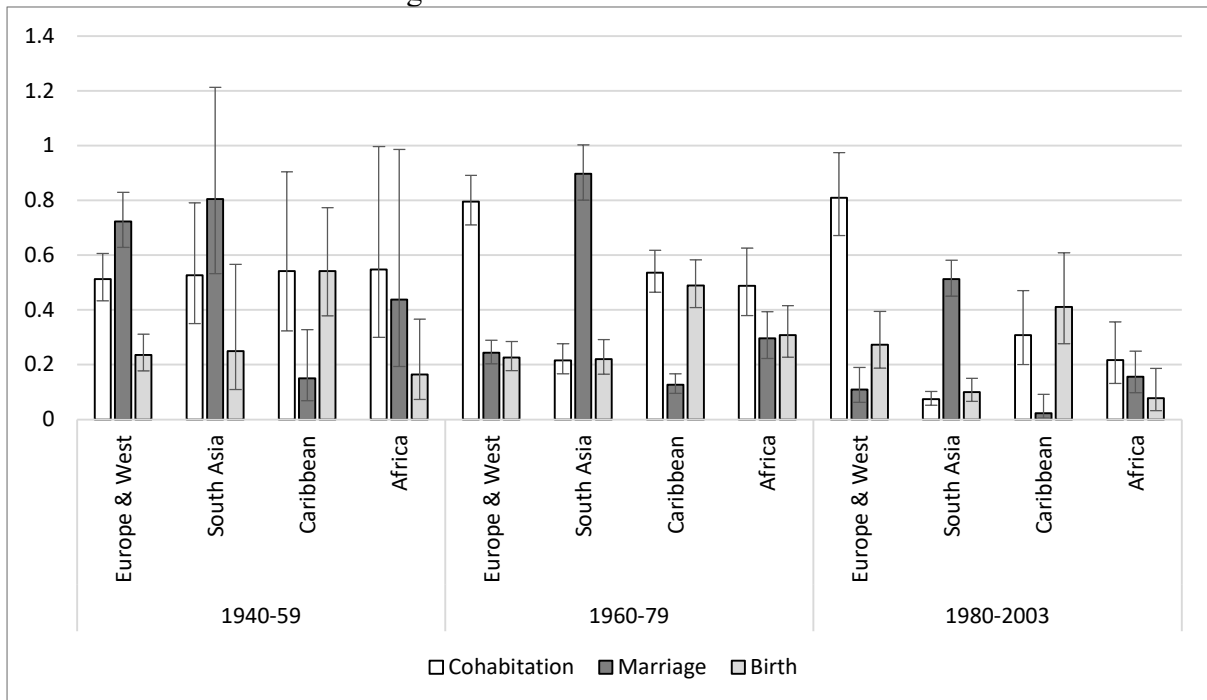
(1980-2003) birth cohort of second generation South Asian women suggesting the postponement of marriage among this group.

Figure 7 Outcomes of unpartnered women: Relative risks of cohabitation, marriage, or childbirth in the UK by migrant origin, migrant generation, and birth cohort

Panel a – Natives and immigrants



Panel b – Descendants of immigrants



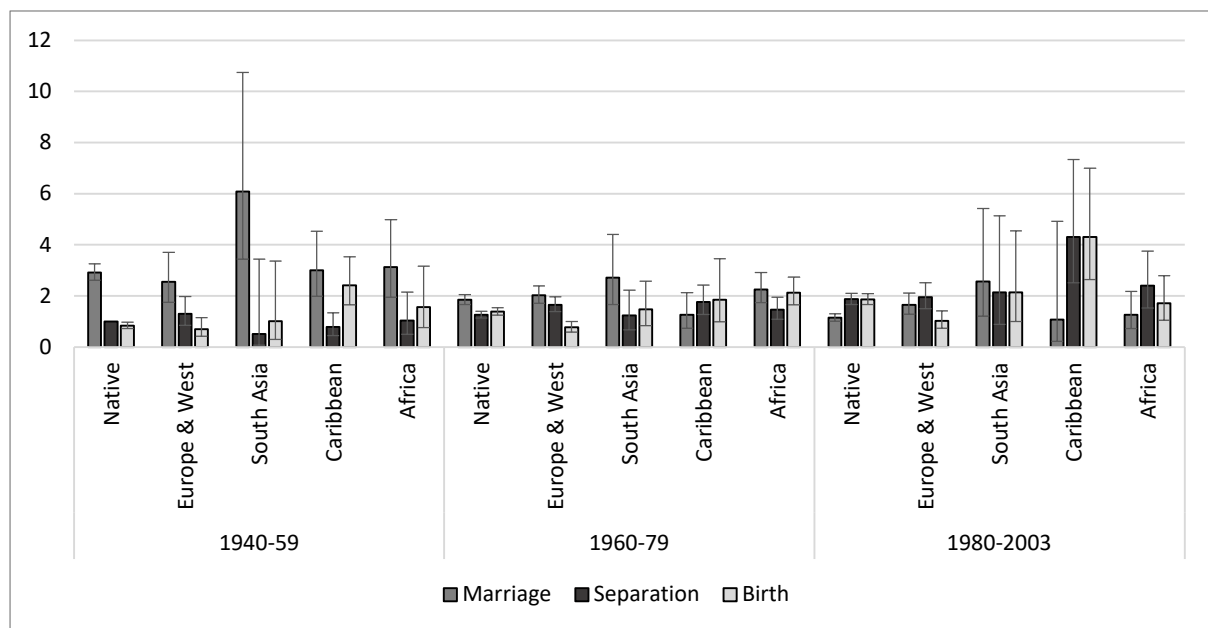
Notes: Unpartnered women refer to never partnered and/or separated women. Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives born between 1940-59 to marry). The analysis is controlled for age, time since separation, order of separation, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

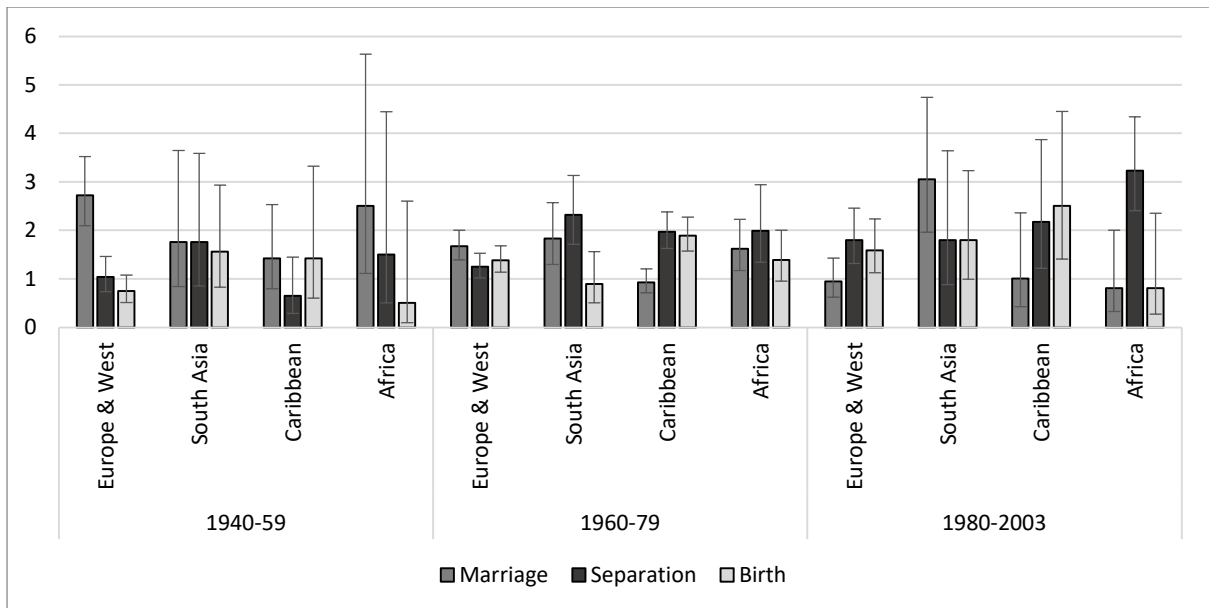
Among native cohabiting women, marriage used to be the most likely outcome, but marriage rates have declined over time and separation rates have increased (Figure 8). Among the youngest cohort, separation and birth are equally likely outcomes of cohabitation and marriage is the least likely. Among cohabiting immigrants and their descendants from European and other Western countries, the risks of marriage have also declined over time. It is difficult to detect any changes over time in the outcomes of cohabitation among women from all other migrant groups mainly due to the limited number of cohabitations that occur in the first place.

Figure 8 Outcomes of cohabiting women: Relative risks of marriage, separation, or childbirth in the UK by migrant origin, migrant generation, and birth cohort

Panel a – Natives and immigrants



Panel b – Descendants of immigrants

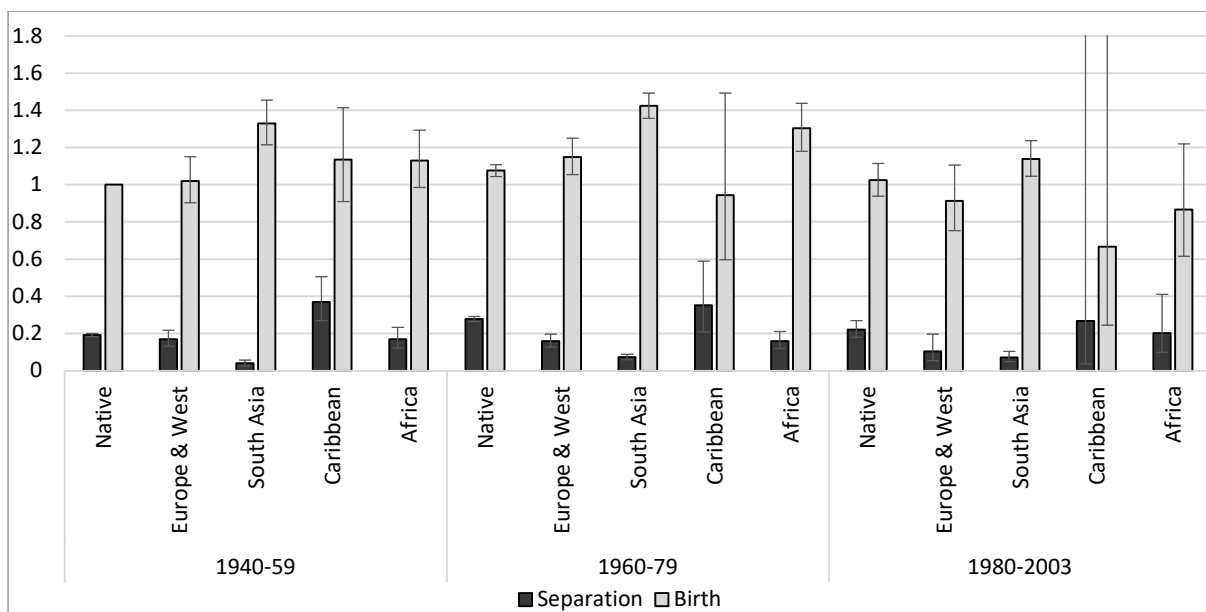


Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives born between 1940-59 to separate). The analysis is controlled for age, duration of marriage, union order, time since previous birth, parity, and level of education.
Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

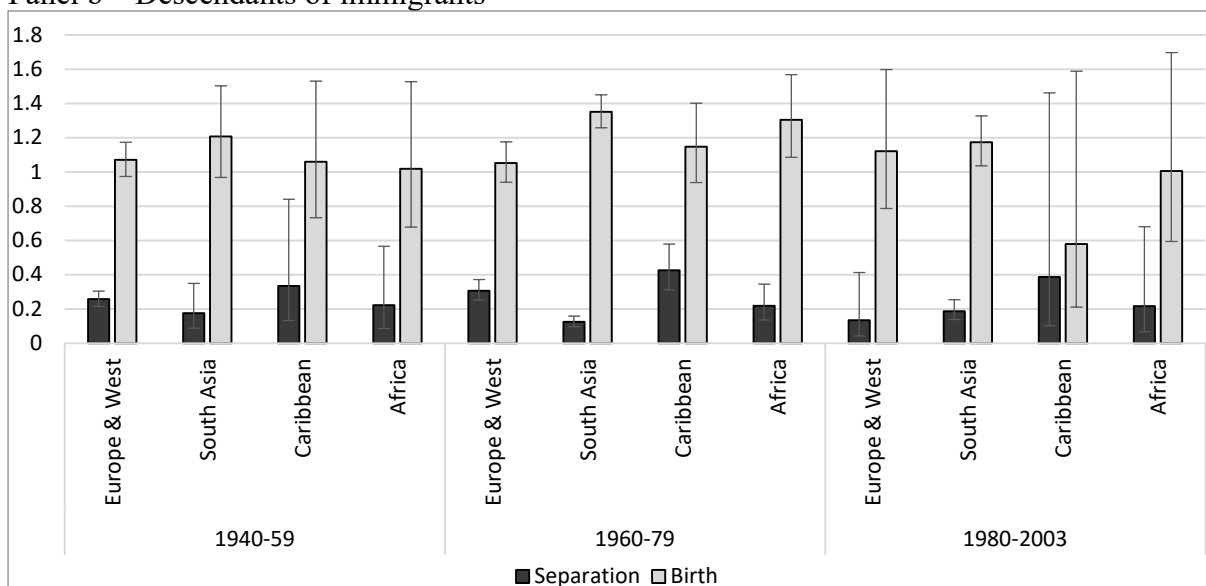
Patterns of separation or birth among married women have remained stable across birth cohorts among native women as well as women from all migrant groups (Figure 9). South Asian immigrants from the youngest birth cohort are less likely to have a child than their counterparts born earlier, which may indicate the postponement of childbearing, but also declining family size. We do not detect any other significant changes in the outcomes of marriages across birth cohorts.

Figure 9 Outcomes of married women: Relative risks of separation or a childbirth in the UK by migrant origin, migrant generation, and birth cohort

Panel a – Natives and immigrants



Panel b – Descendants of immigrants



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives born between 1940-59 to have a child). The analysis is controlled for age, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Conclusion and Discussion

We investigated the interrelationship between partnership and childbearing pathways of immigrants and their descendants in the UK using longitudinal data and an innovative analytical strategy that allowed us to jointly analyse repeated fertility and partnership transitions and account for the role of multiple 'clocks'.

First, we analysed the outcomes of unpartnered (single or separated) women by migrant origin and generation. Among British and European/Western unpartnered women, cohabitation was the most common outcome, followed by marriage and childbirth. Unpartnered women of South Asian origin predominantly marry, whereas those of Caribbean descent are most likely to have children. Second, we studied the outcomes of cohabiting women. Among cohabiting native and European/Western women, marriage is the most likely outcome followed by childbirth, and/or separation. Caribbean and African cohabiting women tend to either marry or have a child and their risk of separation is the lowest. Among South Asians, cohabitation is a rare outcome in the first place, which means that it is not possible to detect any consistent patterns. Third, we investigated the outcomes of married women and found that among married native women as well as immigrants and their descendants from all origin groups, childbirth was a far more likely outcome than separation.

These findings are in line with our expectations. The link between the partnership and fertility behaviours of immigrants and their descendants from geographically close (and culturally similar) countries (Europe and Western countries) is comparable to that of natives, whereas those from conservative countries (South Asia) display a close link between partnership and family transitions. This link is the weakest among women from the Caribbean region. Contrary to our expectations, we did not find overwhelming evidence for significant changes across migrant generations. We expected that the patterns of the second-generation would be in-between those of the natives and immigrants. We did find some evidence for convergence but only among unpartnered women. For example, second-generation South Asian women are less likely to marry than South Asian immigrants. However, this only indicates slight changes in the partnership behaviours of South Asians, namely postponement of marriage, but not a weakening link between partnerships and fertility. We also found some convergence to the native patterns among unpartnered African immigrants.

Our findings thus support the socialisation hypothesis: we found overwhelming evidence of partnership and family formation patterns among immigrants (especially from South Asia and the Caribbean) that resemble those in their origin countries. Regarding the behaviour of the second generation, we showed that their levels of union formation (both marriage and cohabitation) and separation from marriage are in-between those of natives and immigrants, providing some evidence for the adaptation hypothesis. However, their family trajectories are still often similar to those of immigrants, which supports the minority subculture hypothesis.

We also analysed whether and how the partnership and fertility patterns of immigrants and their descendants have changed across birth cohorts. We found the largest change among native unpartnered women: among older cohorts, marriage was the most common outcome whereas among younger cohorts, cohabitation has become dominant. We did not detect any changes across birth cohorts among different migrant groups. This finding indicates that the interrelationship between the fertility and partnership experiences of immigrants and their descendants in the UK have remained stable over time. Among South Asian women, conservative family formation patterns persist even among the youngest cohorts. Similarly, the high risks of separation and unpartnered births among Caribbean women is typical across migrant generations and birth cohorts. These findings challenge our expectation that the youngest birth cohorts across all migrant groups and generations have experienced a significant change in the link between partnership and fertility behaviours.

These findings also challenge previous research that suggested that the behaviour of the second generation (rapidly) converges to that of natives in the UK (Berrington, 1994, 1996). Although partnership formation is postponed among the youngest cohort (those born after 1980), the persistence of pathways similar to those of immigrants suggests that their values and preferences remain different from those of the natives of the same age. It is important to note

that the partnership and fertility histories of the youngest birth cohort are incomplete and thus it remains for future research to establish whether and to what extent their partnership and family formation trajectories converge to those of the natives. A recent study shows that the descendants of Indian immigrants have higher expectations for cohabitation and lower expectations for marriage than women of Pakistani or Bangladeshi origin (Berrington, 2020).

The risk of a birth among unpartnered women was higher than expected among immigrants from India, Pakistan, and Bangladesh. We conducted additional analyses (not shown) to find out whether this pattern is related to data issues. For example, we excluded individuals from the analyses for whom information on the start date of their first or second unions was imputed. Additionally, we dropped different ethnic minority subsamples to determine if any of these might be driving the results. The results remained robust to these sensitivity analyses.

We have conducted a range of further robustness checks. First, we re-estimated the models using information on the time of conceptions rather than births (not shown) to assess whether pre-marital or pre-union conceptions might drive some of the results. We found virtually no change in the results except that unpartnered immigrants from Bangladesh are slightly more likely to experience a first conception than a first birth indicating that ‘shotgun’ marriages might be more common among this group than among other groups. Second, we distinguished between immigrants who arrived in the UK as children, i.e., between the ages 0 and 14, (so called 1.5 generation) and those who arrived as adults (i.e., after age 15; see Appendix Figures A5 to A7). We found that the patterns observed among the 1.5 generation were very similar to those of the first generation.

Third, all respondents have been observed since age 16 using retrospective information on their partnerships and fertility. We thus also utilised information on the life experiences of immigrants before they migrated to the UK. Although this strategy could be criticized as

anticipatory (Hoem & Kreyenfeld, 2006), we aimed to use all available information on immigrants' family lives. To ensure that this decision does not bias our results, we replicated the analyses only keeping post-migration episodes of immigrants (see Appendix Figures A8 to A10). Although the coefficients changed slightly, the patterns remained identical to what is shown in the results section for all three outcomes.

This study has some limitations. First, there might be some heterogeneity among the second generation which our study cannot detect. Due to sample size limitations, we were not able to disaggregate the second generation by whether one or both of their parents were immigrants. Similarly, we were not able to analyse the role of the origin of the partner as this information is only available for partners that are present during the panel waves but not for partners in the retrospective histories. Second, there might be geographical differences in the experiences of immigrants and their descendants. For example, the partnership and fertility patterns of those who live in an ethnically dense area may differ from those who live in areas where the proportion of ethnic minorities is low. However, it is not possible to study this issue with the data at hand firstly because only a few individuals belong to the same area; secondly because the ethnic minority boost samples come from ethnically dense areas; and thirdly because we do not have retrospective information on individuals' place of residence. Third, it is possible that there are unobserved characteristics that jointly influence individuals' partnership and fertility decisions. Future research should explore this using simultaneous equations models.

To summarise, we developed an innovative analytical strategy to analyse entire partnership and fertility trajectories of immigrants and their descendants in the UK from different countries, migrant generations, and across birth cohorts. We found distinct patterns among immigrants from different countries supporting significant heterogeneity in family trajectories among immigrants and their descendants in the UK.

Acknowledgements

This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 834103). We are grateful for the opportunity to use data from the UK Household Longitudinal Study, hosted and managed by the UK Data Service.

References

- Adsera, A., & Chiswick, B. R. (2007). Are there gender and country of origin differences in immigrant labor market outcomes across European destinations? *Journal of Population Economics*, 20(3), 495-526.
- Adsera, A., & Ferrer, A. (2015). Immigrants and Demography: Marriage, Divorce, and Fertility. In B. R. Chiswick & P. W. Miller (Eds.), *Handbook of the Economics of International Migration* (pp. 315-374): Elsevier.
- Alexander, M., Garda, L., Kanade, S., Jejeebhoy, S., & Ganatra, B. (2006). Romance and Sex: Pre-Marital Partnership Formation among Young Women and Men, Pune District, India. *Reproductive Health Matters*, 14(28), 144-155.
- Andersson, G. (2004). Childbearing after migration: fertility patterns of foreign-born women in Sweden. *International Migration Review*, 38(2), 747-775.
- Andersson, G., Obućina, O., & Scott, K. (2015). Marriage and divorce of immigrants and descendants of immigrants in Sweden. *Demographic Research*, 33, 31-64.
- Andersson, G., Persson, L., & Obućina, O. (2017). Depressed fertility among descendants of immigrants in Sweden. *Demographic Research*, 36, 1149-1184.
- Baykara-Krumme, H., & Milewski, N. (2017). Fertility patterns among Turkish women in Turkey and abroad: The effects of international mobility, migrant generation, and family background. *European Journal of Population*, 33, 409-436.
- Berrington, A. (1994). Marriage and family formation among the white and ethnic minority populations in Britain. *Ethnic and Racial Studies*, 17(3), 517-546. doi:10.1080/01419870.1994.9993837
- Berrington, A. (1996). Marriage patterns and inter-ethnic unions. In D. Coleman & J. Salt (Eds.), *Ethnicity in the 1991 Census, Volume One: Demographic Characteristics of the Ethnic Minority Populations* (pp. 178-212). London, UK: HMSO, Office for National Statistics.
- Berrington, A. (2020). Expectations for family transitions in young adulthood among the UK second generation. *Journal of Ethnic and Migration Studies*, 46(5), 913-935. doi:10.1080/1369183X.2018.1539276
- Billari, F., & Kohler, H.-P. (2004). Patterns of low and lowest-low fertility in Europe. *Population Studies*, 58(2), 161-176.
- Castles, S., & Miller, M. J. (2009). *The age of migration: International population movements in the modern world* (4th ed.). New York: Guilford Press.
- Cleves, M., Gould, W., & Marchenko, Y. V. (2016). *An introduction to survival analysis using STATA*. College Station, TX: Stata Press.
- Coleman, D. A., & Dubuc, S. (2010). The fertility of ethnic minorities in the UK, 1960s-2006. *Population Studies*, 64(1), 19-41. doi:10.1080/00324720903391201

- Dale, A., & Ahmed, S. (2011). Marriage and employment patterns amongst UK-raised Indian, Pakistani, and Bangladeshi women. *Ethnic and Racial Studies*, 34(6), 902-924. doi:10.1080/01419870.2011.564058
- Dubuc, S. (2012). Immigration to the UK from High-Fertility Countries: Intergenerational Adaptation and Fertility Convergence. *Population and Development Review*, 38(2), 353-368. doi:10.1111/j.1728-4457.2012.00496.x
- Ermisch, J., & Francesconi, M. (2000). Cohabitation in Great Britain: not for long but here to stay. *Journal of Royal Statistical Society Series A*, 163(2), 153-171.
- Garssen, J., & Nicolaas, H. (2008). Fertility of Turkish and Moroccan women in the Netherlands: Adjustment to native level within one generation. *Demographic Research*, 19, 1249-1280.
- Glick, J. E., Ruf, S. D., White, M. J., & Goldscheider, F. (2006). Educational Engagement and Early Family Formation: Differences by Ethnicity and Generation. *Social Forces*, 84(3), 1391-1415.
- González-Ferrer, A., Castro-Martín, T., Kraus, E. K., & Eremenko, T. (2017). Childbearing patterns among immigrant women and their daughters in Spain. Over-adaptation or structural constraints? *Demographic Research*, 37, 599-634.
- González-Ferrer, A., Hannemann, T., & Castro-Martín, T. (2016). Partnership formation and dissolution among immigrants in the Spanish context. *Demographic Research*, 35, 1-28.
- Gungor, D., Fleischmann, F., & Phalet, K. (2011). Religious identification, beliefs, and practices among Turkish Belgian and Moroccan Belgian Muslims: Intergenerational continuity and acculturative change. *Journal of Cross-Cultural Psychology*, 42(8), 135.
- Hannemann, T., & Kulu, H. (2015). Union formation and dissolution among immigrants and their descendants in the United Kingdom. *Demographic Research*, 33, 273-312.
- Hannemann, T., Kulu, H., González-Ferrer, A., Pailhé, A., Rahnu, L., & Puur, A. (2020). Partnership dynamics among immigrants and their descendants in four European countries. *Population, Space and Place*, 26(5), e2315. doi:10.1002/psp.2315
- Hoem, J. M., & Kreyenfeld, M. (2006). Anticipatory analysis and its alternatives in life-course research. Part 1: The role of education in the study of first childbearing. *Demographic Research*, 15, 461-484.
- Kogan, I. (2007). A study of immigrants' employment careers in West Germany using the sequence analysis technique. *Social Science Research*, 36(2), 491-511. doi:<https://doi.org/10.1016/j.ssresearch.2006.03.004>
- Kristen, C., Reimer, D., & Kogan, I. (2008). Higher Education Entry of Turkish Immigrant Youth in Germany. *International Journal of Comparative Sociology*, 49(2-3), 127-151. doi:10.1177/0020715208088909
- Kuhnt, A., & Krapf, S. (2020). Partnership living arrangements of immigrants and natives in Germany. *Frontiers in Sociology*, 5(538977).
- Kulu, H. (2005). Migration and Fertility: Competing Hypotheses Re-examined. *European Journal of Population / Revue européenne de Démographie*, 21(1), 51-87. doi:10.1007/s10680-005-3581-8
- Kulu, H., & González-Ferrer, A. (2014). Family Dynamics Among Immigrants and Their Descendants in Europe: Current Research and Opportunities. *European Journal of Population*, 30(4), 411-435. doi:10.1007/s10680-014-9322-0
- Kulu, H., & Hannemann, T. (2016a). Introduction to research on immigrant and ethnic minority families in Europe. *Demographic Research*, 35, 31-46.
- Kulu, H., & Hannemann, T. (2016b). Why does fertility remain high among certain UK-born ethnic minority women? *Demographic Research*, 35, 1441-1488.
- Kulu, H., Hannemann, T., Pailh, xe, Ariane, Neels, K., . . . Andersson, G. (2017). Fertility by Birth Order among the Descendants of Immigrants in Selected European Countries. *Population and Development Review*, 43(1), 31-60.
- Kulu, H., & Milewski, N. (2007). Family change and migration in the life course: An introduction. *Demographic Research*, 17, 567-590.

- Kulu, H., Milewski, N., Hannemann, T., & Mikolai, J. (2019). A decade of life-course research on fertility of immigrants and their descendants in Europe. *Demographic Research*, *40*, 1345-1374.
- McFall, S., Nandi, A., & Platt, L. (2019). *Understanding Society: UK Household Longitudinal Study: User Guide to ethnicity and immigration research*. Retrieved from Colchester:
- Mikolai, J., Berrington, A., & Perelli-Harris, B. (2018). The role of education in the intersection of partnership transitions and motherhood in Europe and the United States. *Demographic Research*, *39*, 753-794.
- Mikolai, J., & Lyons-Amos, M. (2017). Longitudinal methods for life course research: A comparison of sequence analysis, latent class growth models, and multistate event history models for studying partnership transitions. *Longitudinal and Life Course Studies*, *8*(2), 191-208.
- Milewski, N. (2007). First child of immigrant workers and their descendants in West Germany: Interrelation of events, disruption, or adaptation? *Demographic Research*, *17*, 859-896.
- Milewski, N. (2010a). *Fertility of immigrants. A two-generational approach in Germany*. Hamburg: Springer.
- Milewski, N. (2010b). Immigrant fertility in West Germany: Is there a socialization effect in transitions to second and third births? *European Journal of Population / Revue européenne de Démographie*, *26*(3), 297-323. doi:10.1007/s10680-010-9211-0
- Miner, D. C. (2003). Jamaican families. *Holistic Nursing Practice*, *17*(1), 27-35.
- Murphy, M. (2000). The evolution of cohabitation in Britain, 1960-95. *Population Studies*, *54*(1), 43-56. doi:<https://doi.org/10.1080/713779062>
- Mussino, E., & Strozza, S. (2012a). Does citizenship still matter? Second birth risks of migrants from Albania, Morocco, and Romania in Italy. *European Journal of Population*, *28*, 269-302.
- Mussino, E., & Strozza, S. (2012b). The fertility of immigrants after arrival: The Italian case. *Demographic Research*, *26*, 99-130.
- Nandi, A., Menon, S., & Smith, R. (2020). *Understanding Society: Marital and Cohabitation Histories, 1991-2018. User Guide*. Retrieved from Colchester:
- Office for National Statistics. (2019). Population of the UK by country of birth and nationality: 2019. *Statistical bulletin*.
- Office for National Statistics. (2020). Population of the UK by country of birth and nationality: year ending June 2020. *Statistical bulletin*.
- Pailhé, A. (2015). Partnership dynamics across generations of immigration in France: Structural vs. cultural factors. *Demographic Research*, *33*, 451-498.
- Pailhé, A. (2017). The convergence of second-generation immigrants' fertility patterns in France: The role of sociocultural distance between parents' and host country. *Demographic Research*, *36*, 1361-1398.
- Perelli-Harris, B., Sigle-Rushton, W., Kreyenfeld, M., Lappegård, T., Keizer, R., & Berghammer, C. (2010). The educational gradient of childbearing within cohabitation in Europe. *Population and Development Review*, *36*(4), 775-801. doi:10.1111/j.1728-4457.2010.00357.x
- Poston, D. L., Chang, C. F., & Dan, H. (2006). Fertility differences between the majority and minority nationality groups in China. *Population Research and Policy Review*, *25*(1), 67-101.
- Putter, H. (2011). Tutorial in biostatistics: Competing risks and multi-state models. Analyses using the mstate package.
- Puur, A., Rahnu, L., Abuladze, L., Sakkeus, L., & Zakharov, S. (2017). Childbearing among first- and second-generation Russians in Estonia against the background of the sending and host countries. *Demographic Research*, *36*, 1209-1254.
- Rendall, M. S., Tsang, F., Rubin, J. K., Rabinovich, L., & Janta, B. (2010). Contrasting Trajectories of Labor-Market Integration Between Migrant Women in Western and Southern Europe. *European Journal of Population*, *26*(4), 383-410. doi:10.1007/s10680-010-9214-x
- Robards, J., & Berrington, A. (2016). The fertility of recent migrants to England and Wales. *Demographic Research*, *34*, 1037-1052.

- Rojas, E. A. G., Bernardi, L., & Schmid, F. (2018). First and second births among immigrants and their descendants in Switzerland. *Demographic Research*, 38, 247-286.
- Scott, K., & Stanfors, M. (2011). The transition to parenthood among the second generation: Evidence from Sweden, 1990–2005. *Advances in Life Course Research*, 16(4), 190-204. doi:<https://doi.org/10.1016/j.alcr.2011.09.003>
- Shankley, W., & Finney, N. (2020). Ethnic minorities and housing in Britain. In B. Byrne, C. Alexander, O. Khan, J. Nazroo, & W. Shankley (Eds.), *Ethnicity, Race and Inequality in the UK. State of the Nation*. (pp. 149-166): Policy Press.
- Thomson, E. (2014). Family complexity in Europe. *The ANNALS of the American Academy of Political and Social Science*, 654(1), 245-258.
- Thomson, E., Winkler-Dworak, M., Spielauer, M., & Prskawetz, A. (2012). Union instability as an engine of fertility? A microsimulation model for France. *Demography*, 49(1), 175-195. doi:10.1007/s13524-011-0085-5
- University of Essex, I. f. S. a. E. R. (2020a). *Understanding Society: Marital and Cohabitation Histories, 1991-2018. [data collection]. 2nd Edition. UK Data Service. SN: 8473*, <http://doi.org/10.5255/UKDA-SN8473-2>
- University of Essex, I. f. S. a. E. R. (2020b). *Understanding Society: Waves 1-10, 2009-2019 and Harmonised BHPS: Waves 1-18, 1991-2009: Special Licence Access. [data collection]. 12th Edition. UK Data Service. SN: 6931*, <http://doi.org/10.5255/UKDA-SN-6931-11>.
- Van Landschoot, L., de Valk, H. A. G., & Van Bavel, J. (2017). Fertility among descendants of immigrants in Belgium: The role of the partner. *Demographic Research*, 36, 1827-1858.
- Waller, L., Berrington, A., & Raymer, J. (2014). New insights into the fertility patterns of recent Polish migrants in the United Kingdom. *Journal of Population Research*, 31(2), 131-150. doi:10.1007/s12546-014-9125-5
- Wilson, B., & Kuha, J. (2018). Residential segregation and the fertility of immigrants and their descendants. *Population, Space and Place*, 24(3), e2098. doi:10.1002/psp.2098

Appendix

Table A1 Comparison of estimates from Office for National Statistics (ONS) data and weighted Understanding Society (UKHLS) data on fertility, partnership formation, and partnership dissolution indicators for women in England and Wales

Cumulative percentage of women who ever had a child by age and birth cohort										
	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS
	1940-49		1950-59		1960-69		1970-79		1980-89	
Age										
20	15.9	18.6	17.1	17.0	12.0	14.7	12.5	14.7	11.8	14.6
25	58.3	58.3	46.6	44.6	36.1	39.0	32.4	35.3	31.5	33.6
30	80.7	79.5	70.1	68.2	59.4	64.4	53.7	58.8	53.2	46.6
35	87.0	85.9	79.9	79.4	73.4	78.7	72.3	76.5	73.6	51.7
40	88.5	87.6	83.2	82.8	79.1	84.4	80.7	81.5		
45	88.9	88.2	84.0	83.3	80.5	85.2				
Average number of children by age and birth cohort										
	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS
	1940-49		1950-59		1960-69		1970-79		1980-89	
Age										
20	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2
25	1.0	1.1	0.8	0.8	0.6	0.7	0.5	0.6	0.5	0.5
30	1.8	1.7	1.4	1.4	1.2	1.3	1.0	1.1	1.0	0.9
35	2.1	2.1	1.8	1.9	1.7	1.8	1.5	1.6	1.6	1.0
40	2.2	2.2	2.0	2.1	1.9	2.0	1.8	1.8		
45	2.2	2.2	2.0	2.1	1.9	2.1	1.9	1.9		
Cumulative percentage of ever married women by age and birth cohort										
	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS
	1940-49		1950-59		1960-69		1970-79		1980-89	
Age										
20	28.0	35.2	29.5	32.2	14.1	17.3	4.7	7.6	2.0	3.6
25	80.6	80.4	72.5	69.2	49.1	46.8	24.6	29.2	13.6	18.6
30	91.1	89.8	84.8	81.2	67.7	64.9	45.9	53.4	36.0	33.9
35	93.9	92.6	89.0	85.4	75.6	73.4	59.9	66.6		
40	94.9	93.4	90.7	87.4	79.1	78.1	69.4	71.1		
45	95.4	94.1	91.5	88.7	82.0	80.8				
Cumulative percentage of ever divorced women by marriage duration and marriage cohort										
	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS		
	1965-74		1975-84		1985-94		1995-2004			
Marriage duration										
1	0.0	0.3	0.0	0.6	0.0	1.8	0.0	0.7		
3	0.2	2.7	1.3	4.1	4.4	6.5	3.9	4.7		
5	4.1	5.8	8.6	10.1	10.9	11.2	10.0	9.3		
10	13.8	13.5	20.4	20.9	23.8	21.1	23.1	17.8		
15	20.7	20.6	28.1	27.2	32.1	29.4	31.4	23.0		
20	25.6	25.8	33.3	32.5	37.6	34.9	37.5	24.8		
25	29.3	28.8	37.1	37.3	41.2	38.4				
30	31.6	31.5	39.4	40.4	42.9	39.2				
Cumulative percentage of ever remarried women by age and birth cohort										
	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS	ONS	UKHLS
	1940-49		1950-59		1960-69		1970-79		1980-89	
Age										
25	1.0	1.0	2.1	2.1	1.3	1.4	0.5	0.5	0.2	0.4

30	4.7	3.8	7.2	6.2	4.8	4.7	2.1	2.1	1.0	1.4
35	9.1	7.7	12.0	10.2	8.9	8.2	4.8	4.6		
40	13.0	11.0	15.8	13.6	12.4	11.5	8.7	7.0		
45	16.1	14.4	18.7	16.2	15.8	14.6				
50	18.5	16.5	21.1	18.9	19.5	16.8				
Cumulative percentage of ever cohabiting women by age and birth cohort (UKHLS only)										
	1940-49	1950-59	1960-69	1970-79	1980-89					
Age										
20	1.7	7.8	17.0	21.5	23.9					
25	6.3	20.8	41.3	51.3	51.5					
30	10.0	29.6	53.9	65.3	59.6					
35	13.6	34.9	59.7	70.0	61.0					
40	16.6	39.2	63.1	71.7						
45	19.8	42.1	64.7	72.3						

Notes: The estimates from UKHLS are weighted using the first available cross-sectional weight for each individual.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Table A2 Numbers and proportions of person-months, and partnership and fertility events among women in the UK by categories of variables

	Outcomes of unpartnered women							
	Person-months		Cohabitation		Marriage		Birth	
	N	%	N	%	N	%	N	%
<i>Age</i>								
16-19	1188585	36.2	2968	19.3	3264	26.6	1403	23.0
20-24	849842	25.9	5419	35.3	5461	44.5	1993	32.7
25-29	398296	12.1	3170	20.7	2026	16.5	1349	22.1
30-34	259357	7.9	1673	10.9	683	5.6	789	13.0
35-39	231354	7.1	1034	6.7	396	3.2	431	7.1
40-44	196360	6.0	664	4.3	280	2.3	112	1.8
45-49	155512	4.7	414	2.7	173	1.4	15	0.2
<i>Birth cohort</i>								
1940-1959	981944	29.9	2804	18.3	6266	51.0	1312	21.5
1960-1979	1623837	49.5	9165	59.7	4870	39.6	3391	55.7
1980-2003	673525	20.5	3373	22.0	1147	9.3	1389	22.8
<i>Time since separation</i>								
0-1 year	115598	3.5	1366	8.9	261	2.1	529	8.7
1-3 years	173112	5.3	1699	11.1	282	2.3	459	7.5
3-5 years	120480	3.7	919	6.0	222	1.8	248	4.1
5+ years	288475	8.8	1467	9.6	445	3.6	373	6.1
<i>Order of separation</i>								
Never partnered	2581642	78.7	9891	64.5	11073	90.1	4483	73.6
Separated once	540061	16.5	4193	27.3	1023	8.3	1336	21.9
Separated two or more times	157604	4.8	1258	8.2	187	1.5	273	4.5
<i>Time since previous birth</i>								
0-1 year	69707	2.1	567	3.7	306	2.5	134	2.2
1-3 years	124391	3.8	737	4.8	267	2.2	1143	18.8
3-5 years	100704	3.1	623	4.1	210	1.7	630	10.3
5+ years	472990	14.4	2178	14.2	720	5.9	768	12.6
<i>Parity</i>								
No child	2511515	76.6	11237	73.2	10780	87.8	3417	56.1
One child	314444	9.6	1956	12.7	763	6.2	1505	24.7
Two or more children	453347	13.8	2149	14.0	740	6.0	1170	19.2
<i>Level of education</i>								
Low	1713303	52.2	6494	42.3	6663	54.2	3893	63.9
Medium	1150590	35.1	5869	38.3	3891	31.7	1787	29.3
High	415413	12.7	2979	19.4	1729	14.1	412	6.8
<i>Total</i>	3279306	100	15342	100	12283	100	6092	100
<i>Employment status (subsample)</i>								
Full-time employed	982513	46.5	6325	59.4	5210	68.6	857	25.1
Part-time employed	156901	7.4	996	9.4	382	5.0	215	6.3
Self-employed	35149	1.7	254	2.4	126	1.7	30	0.9
In full-time education	670366	31.7	1509	14.2	831	10.9	379	11.1
Unemployed	61615	2.9	338	3.2	168	2.2	249	7.3
Other	205441	9.7	1228	11.5	883	11.6	1691	49.4
<i>Total</i>	2111984	100	10650	100	7600	100	3421	100
Outcomes of cohabiting women								
	Person-months		Marriage		Separation		Birth	
	N	%	N	%	N	%	N	%
<i>Age</i>								

16-19	43097	6.0	360	4.8	518	9.3	632	11.6
20-24	180453	25.0	1943	25.8	1701	30.6	1784	32.8
25-29	179357	24.9	2411	32.0	1347	24.2	1527	28.1
30-34	116411	16.1	1330	17.7	828	14.9	887	16.3
35-39	89260	12.4	737	9.8	568	10.2	478	8.8
40-44	66355	9.2	443	5.9	402	7.2	130	2.4
45-49	45926	6.4	300	4.0	201	3.6	4	0.1
<i>Birth cohort</i>								
1940-1959	139338	19.3	1876	24.9	664	11.9	594	10.9
1960-1979	471261	65.4	4768	63.4	3519	63.2	3585	65.9
1980-2003	110260	15.3	880	11.7	1382	24.8	1263	23.2
<i>Duration of cohabitation</i>								
0-1 year	230059	31.9	2877	38.2	1745	31.4	1608	29.5
1-3 years	182229	25.3	2338	31.1	1756	31.6	1761	32.4
3-5 years	103400	14.3	1070	14.2	820	14.7	888	16.3
5+ years	205171	28.5	1239	16.5	1244	22.4	1185	21.8
<i>Union order</i>								
First union	460257	63.8	4942	65.7	3467	62.3	3829	70.4
Second or higher order union	260602	36.2	2582	34.3	2098	37.7	1613	29.6
<i>Time since previous birth</i>								
0-1 year	60278	8.4	574	7.6	442	7.9	90	1.7
1-3 years	85454	11.9	751	10.0	572	10.3	1209	22.2
3-5 years	50989	7.1	387	5.1	382	6.9	677	12.4
5+ years	165604	23.0	1285	17.1	1071	19.2	731	13.4
<i>Parity</i>								
No child	358535	49.7	4527	60.2	3098	55.7	2735	50.3
One child	149388	20.7	1331	17.7	1148	20.6	1682	30.9
Two or more children	212936	29.5	1666	22.1	1319	23.7	1025	18.8
<i>Level of education</i>								
Low	321611	44.6	2966	39.4	2270	40.8	2943	54.1
Medium	252401	35.0	2726	36.2	2191	39.4	1861	34.2
High	146847	20.4	1832	24.3	1104	19.8	638	11.7
<i>Total</i>	720859	100	7524	100	5565	100	5442	100
<i>Employment status (subsample)</i>								
Full-time employed	270051	53.7	3297	61.6	1996	52.3	832	22.9
Part-time employed	75806	15.1	696	13.0	445	11.6	360	9.9
Self-employed	17732	3.5	166	3.1	128	3.4	64	1.8
In full-time education	30088	6.0	226	4.2	417	10.9	155	4.3
Unemployed	15928	3.2	115	2.1	187	4.9	177	4.9
Other	93600	18.6	850	15.9	647	16.9	2043	56.3
<i>Total</i>	503205	100	5350	100	3820	100	3631	100

Outcomes of married women

	Person-months		Separation		Birth	
	N	%	N	%	N	%
<i>Age</i>						
16-19	58683	1.7	140	2.6	1499	5.1
20-24	406510	12.0	851	15.8	7778	26.6
25-29	645004	19.0	1193	22.1	9844	33.6
30-34	663607	19.5	1180	21.9	6731	23.0
35-39	637114	18.7	979	18.2	2889	9.9
40-44	545176	16.0	663	12.3	500	1.7
45-49	442165	13.0	386	7.2	29	0.1
<i>Birth cohort</i>						
1940-1959	1826094	53.7	2477	45.9	13537	46.2

1960-1979	1471813	43.3	2680	49.7	14020	47.9
1980-2003	100350	3.0	235	4.4	1713	5.9
<i>Duration of marriage</i>						
0-1 year	350798	10.3	695	12.9	4447	15.2
1-3 years	397426	11.7	791	14.7	7589	25.9
3-5 years	357227	10.5	725	13.4	6246	21.3
5+ years	2292807	67.5	3181	59.0	10988	37.5
<i>Union order</i>						
First union	3008737	88.5	4409	81.8	26973	92.2
Second or higher order union	389521	11.5	983	18.2	2333	8.0
<i>Time since previous birth</i>						
0-1 year	339790	10.0	464	8.6	634	2.2
1-3 years	552898	16.3	913	16.9	9232	31.5
3-5 years	356046	10.5	655	12.1	4347	14.9
5+ years	1431906	42.1	2099	38.9	2872	9.8
<i>Parity</i>						
No child	717256	21.1	1261	23.4	12185	41.6
One child	688394	20.3	1170	21.7	10455	35.7
Two or more children	1992608	58.6	2961	54.9	6630	22.7
<i>Level of education</i>						
Low	1793515	52.8	2803	52.0	15240	52.1
Medium	1034296	30.4	1833	34.0	8921	30.5
High	570447	16.8	756	14.0	5109	17.5
<i>Total</i>	3398258	100	5392	100	29270	100
<i>Employment status (subsample)</i>						
Full-time employed	888584	39.4	1763	46.7	4189	22.6
Part-time employed	518044	23.0	724	19.2	1672	9.0
Self-employed	92546	4.1	126	3.3	466	2.5
In full-time education	53459	2.4	116	3.1	542	2.9
Unemployed	31538	1.4	88	2.3	323	1.7
Other	671097	29.8	961	25.4	11384	61.3
<i>Total</i>	2255267	100	3778	100	18576	100

Notes: Unpartnered women refer to never partnered and/or separated women.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Table A3 Outcomes of unpartnered women: Relative risks of cohabitation, marriage, and childbirth in the UK

	Full sample				Employment sample			
	Model 1		Model 2a		Model 2b		Model 3	
	RR	Sig	RR	Sig	RR	Sig	RR	Sig
<i>Constant</i>	0.01	***	0.01	***	0.01	***	0.01	***
<i>Age</i>								
16-19	0.44	***	0.43	***	0.39	***	0.53	***
20-24 (ref)	1		1		1		1	
25-29	0.99		0.97	*	0.96	*	0.86	***
30-34	0.68	***	0.67	***	0.66	***	0.59	***
35-39	0.45	***	0.44	***	0.44	***	0.40	***
40-44	0.30	***	0.29	***	0.30	***	0.27	***
45-49	0.22	***	0.21	***	0.21	***	0.19	***
<i>Birth cohort</i>								
1940-1959 (ref)	1		1		1		1	
1960-1979	0.94	***	0.95	***	0.95	**	0.98	
1980-2003	0.78	***	0.79	***	0.71	***	0.81	***
<i>Migrant origin x type of transition</i>								
Native x cohabitation	1.57	***	1.57	***	1.56	***	1.56	***
1G Europe & Western x cohabitation	1.39	***	1.40	***	1.44	***	1.65	***
1G India x cohabitation	0.18	***	0.18	***	0.21	***	0.25	***
1G Pakistan x cohabitation	0.08	***	0.08	***	0.16	***	0.16	***
1G Bangladesh x cohabitation	0.05	***	0.05	***	0.08	**	0.09	**
1G Caribbean x cohabitation	0.74	**	0.74	**	1.07		1.22	
1G Africa x cohabitation	0.57	***	0.58	***	0.65	***	0.79	*
1G Other x cohabitation	0.79	***	0.79	***	0.92		1.12	
2G Europe & Western x cohabitation	1.4	***	1.41	***	1.44	***	1.48	***
2G India x cohabitation	0.53	***	0.54	***	0.61	***	0.64	**
2G Pakistan x cohabitation	0.18	***	0.18	***	0.25	***	0.25	***
2G Bangladesh x cohabitation	0.13	***	0.13	***	0.13	***	0.14	***
2G Caribbean x cohabitation	1.02		1.03		1.12		1.19	
2G Africa x cohabitation	0.82		0.83		1.00		1.16	
2G Other x cohabitation	1.15	*	1.16	**	1.14	*	1.21	**
Native x marriage (ref)	1		1		1		1	
1G Europe & Western x marriage	0.79	***	0.79	***	0.76	***	0.88	
1G India x marriage	2.12	***	2.12	***	2.13	***	2.48	***
1G Pakistan x marriage	2.52	***	2.49	***	2.49	***	2.52	***
1G Bangladesh x marriage	3.69	***	3.65	***	3.68	***	3.90	***
1G Caribbean x marriage	0.48	***	0.49	***	0.52	***	0.59	**
1G Africa x marriage	0.95		0.96		0.93		1.14	
1G Other x marriage	0.94	*	0.95		0.87	*	1.06	
2G Europe & Western x marriage	0.78	***	0.79	***	0.80	***	0.82	**
2G India x marriage	1.38	***	1.40	***	1.30	**	1.36	***
2G Pakistan x marriage	1.93	***	1.93	***	1.70	***	1.77	***
2G Bangladesh x marriage	0.95		0.96		0.81		0.87	
2G Caribbean x marriage	0.23	***	0.23	***	0.24	***	0.25	***
2G Africa x marriage	0.53	***	0.54	***	0.46	***	0.54	**
2G Other x marriage	0.41	***	0.41	***	0.44	***	0.46	***
Native x birth	0.47	***	0.47	***	0.43	***	0.43	***
1G Europe & Western x birth	0.31	***	0.31	***	0.27	***	0.31	***
1G India x birth	0.27	***	0.27	***	0.14	***	0.17	***
1G Pakistan x birth	0.45	***	0.45	***	0.31	***	0.32	***
1G Bangladesh x birth	0.53	**	0.52	**	0.25	*	0.27	*

1G Caribbean x birth	1.33	**	1.33	***	1.33	*	1.52	**
1G Africa x birth	0.7	***	0.71	***	0.67	***	0.82	
1G Other x birth	0.61	***	0.61	***	0.52	***	0.63	***
2G Europe & Western x birth	0.47	***	0.48	***	0.39	***	0.40	***
2G India x birth	0.27	***	0.28	***	0.22	***	0.23	***
2G Pakistan x birth	0.48	***	0.48	***	0.44	***	0.46	***
2G Bangladesh x birth	0.25	***	0.25	***	0.15	***	0.16	***
2G Caribbean x birth	0.98		0.98		0.94		1.00	
2G Africa x birth	0.45	***	0.45	***	0.49	***	0.57	**
2G Other x birth	0.59	***	0.60	***	0.53	***	0.56	***
<i>Time since separation</i>								
No separation (ref)	1		1		1		1	
0-1 year	1.65	***	1.66	***	1.69	***	1.61	***
1-3 years	1.33	***	1.33	***	1.32	***	1.28	***
3-5 years	1.26	***	1.27	***	1.28	***	1.24	***
5+ years	1.29	***	1.29	***	1.26	***	1.22	***
<i>Order of separation</i>								
Separated less than twice (ref)	1		1		1		1	
Separated two or more times	1.19	***	1.19	***	1.14	***	1.16	***
<i>Time since previous birth</i>								
No birth (ref)	1		1		1		1	
0-1 year	1.21	***	1.20	***	1.24	***	0.85	**
1-3 years	1.35	***	1.33	***	1.27	***	0.94	
3-5 years	1.16	***	1.15	***	1.12	*	0.89	
5+ years	1.01		1.01		1.00		0.90	**
<i>Parity</i>								
Less than two children (ref)	1		1		1		1	
Two or more children	0.80	***	0.80	***	0.79	***	0.80	***
<i>Level of education</i>								
Low (ref)			1		1		1	
Medium			0.87	***	0.858	***	0.99	
High			0.99		0.99		1.10	*
<i>Employment status</i>								
Full-time employed (ref)							1	
Part-time employed							1.01	
Self-employed							1.12	*
In full-time education							0.37	***
Unemployed							1.13	**
Other							1.71	***
ln-L	-67988.9		-67923.3		-42815.7		-41229.5	
N	27943		27943		18671		18671	

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001. Unpartnered women refer to never partnered and/or separated women. Ref indicates the reference category. RR refers to relative risks. Model 2a – Model 1 + education; Model 2b – same as Model 1 but estimated on the restricted sample for whom retrospective employment histories are available; Model 3 – Model 2b + employment.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Table A4 Outcomes of cohabiting women: Relative risks of marriage, separation, or childbirth in the UK

	Full sample				Employment sample			
	Model 1		Model 2a		Model 2b		Model 3	
	RR	Sig	RR	Sig	RR	Sig	RR	Sig
<i>Constant</i>	0.01	***	0.01	***	0.01	***	0.01	***
<i>Age</i>								
16-19	1.18	***	1.16	***	1.16	***	1.11	**
20-24 (ref)	1		1		1		1	
25-29	1.04		1.05	*	1.08	**	1.08	**
30-34	0.96		0.98		1.01		1.02	
35-39	0.75	***	0.77	***	0.80	***	0.84	***
40-44	0.56	***	0.57	***	0.58	***	0.61	***
45-49	0.41	***	0.43	***	0.43	***	0.45	***
<i>Birth cohort</i>								
1940-1959 (ref)	1		1		1		1	
1960-1979	0.96		0.96		0.97		0.95	
1980-2003	1.03		1.04		1.08	*	1.06	
<i>Migrant origin x type of transition</i>								
Native x marriage	1.43	***	1.43	***	1.48	***	1.48	***
1G Europe & Western x marriage	1.48	***	1.50	***	1.45	***	1.46	***
1G India x marriage	2.61	***	2.64	***	2.34	**	2.26	**
1G Pakistan & Bangladesh x marriage	2.00	*	2.02	*	2.02		2.42	**
1G Caribbean x marriage	1.63	**	1.62	**	1.59		1.87	**
1G Africa x marriage	1.65	***	1.66	***	1.74	***	1.76	***
1G Other x marriage	1.61	***	1.62	***	1.69	***	1.75	***
2G Europe & Western x marriage	1.36	***	1.35	***	1.42	***	1.42	***
2G India x marriage	1.41	*	1.42	*	1.69	**	1.63	*
2G Pakistan & Bangladesh x marriage	1.83	**	1.83	**	1.37		1.21	
2G Caribbean x marriage	0.74	**	0.74	**	0.75	*	0.82	
2G Africa x marriage	1.14		1.16		1.09		1.09	
2G Other x marriage	1.11		1.13		1.22	*	1.26	*
Native x separation (ref)	1		1		1		1	
1G Europe & Western x separation	1.25	***	1.26	***	1.20	*	1.21	*
1G India x separation	1.12		1.13		0.94		0.90	
1G Pakistan & Bangladesh x separation	0.67		0.67		0.58		0.69	
1G Caribbean x separation	1.06		1.06		1.27		1.50	*
1G Africa x separation	1.16		1.18		1.30		1.32	
1G Other x separation	1.21	**	1.22	**	1.19	*	1.23	*
2G Europe & Western x separation	0.96		0.96		1.04		1.04	
2G India x separation	1.58	**	1.60	**	1.59	*	1.53	*
2G Pakistan & Bangladesh x separation	1.64	*	1.65	*	1.71	*	1.52	
2G Caribbean x separation	1.43	***	1.42	***	1.45	**	1.57	***
2G Africa x separation	1.61	**	1.64	**	1.78	**	1.77	**
2G Other x separation	1.30	***	1.32	***	1.30	**	1.34	**
Native x birth	1.04		1.04		1.00		1.00	
1G Europe & Western x birth	0.61	***	0.62	***	0.59	***	0.60	***
1G India x birth	1.30		1.32		1.41		1.35	
1G Pakistan & Bangladesh x birth	0.83		0.84		0.58		0.69	
1G Caribbean x birth	1.73	***	1.73	***	1.80	**	2.12	***
1G Africa x birth	1.47	***	1.48	***	1.39	*	1.40	*
1G Other x birth	1.01		1.02		1.06		1.10	
2G Europe & Western x birth	0.96		0.96		0.93		0.93	
2G India x birth	0.69		0.70		0.97		0.94	

2G Pakistan & Bangladesh x birth	1.37		1.37		1.14		1.01	
2G Caribbean x birth	1.44	***	1.44	***	1.46	***	1.58	***
2G Africa x birth	0.91		0.92		0.69		0.69	
2G Other x birth	0.84		0.85		0.86		0.89	
<i>Duration of cohabitation</i>								
0-1 year (ref)	1		1		1		1	
1-3 years	1.12	***	1.12	***	1.06	**	1.05	*
3-5 years	0.96		0.96		0.93	*	0.92	**
5+ years	0.77	***	0.77	***	0.74	***	0.71	***
<i>Union order</i>								
First union (ref)	1		1		1		1	
Second or higher order union	1.14	***	1.14	***	1.14	***	1.13	***
<i>Time since previous birth</i>								
No birth (ref)	1		1		1		1	
0-1 year	0.69	***	0.68	***	0.71	***	0.46	***
1-3 years	1.19	***	1.17	***	1.18	***	0.86	***
3-5 years	1.26	***	1.23	***	1.24	***	0.96	***
5+ years	1.05		1.03		1.05		0.92	*
<i>Parity</i>								
Less than two children (ref)	1		1		1		1	
Two or more children	0.80	***	0.80	***	0.79	***	0.75	***
<i>Level of education</i>								
Low (ref)			1		1		1	
Medium			0.98		0.98		1.07	**
High			0.91	***	0.90	***	1.00	***
<i>Employment status</i>								
Full-time employed (ref)							1	
Part-time employed							1.13	***
Self-employed							1.09	
In full-time education							0.99	
Unemployed							1.55	***
Other							2.29	***
ln-L	-15975.4		-15965.2		-10806.0		-10248.0	
N	11513		11513		7855		7855	

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001. RR refers to relative risks. Ref indicates the reference category. Model 2a – Model 1 + education; Model 2b – same as Model 1 but estimated on the restricted sample for whom retrospective employment histories are available; Model 3 – Model 2b + employment.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Table A5 Outcomes of married women: Relative risks of separation or childbirth in the UK

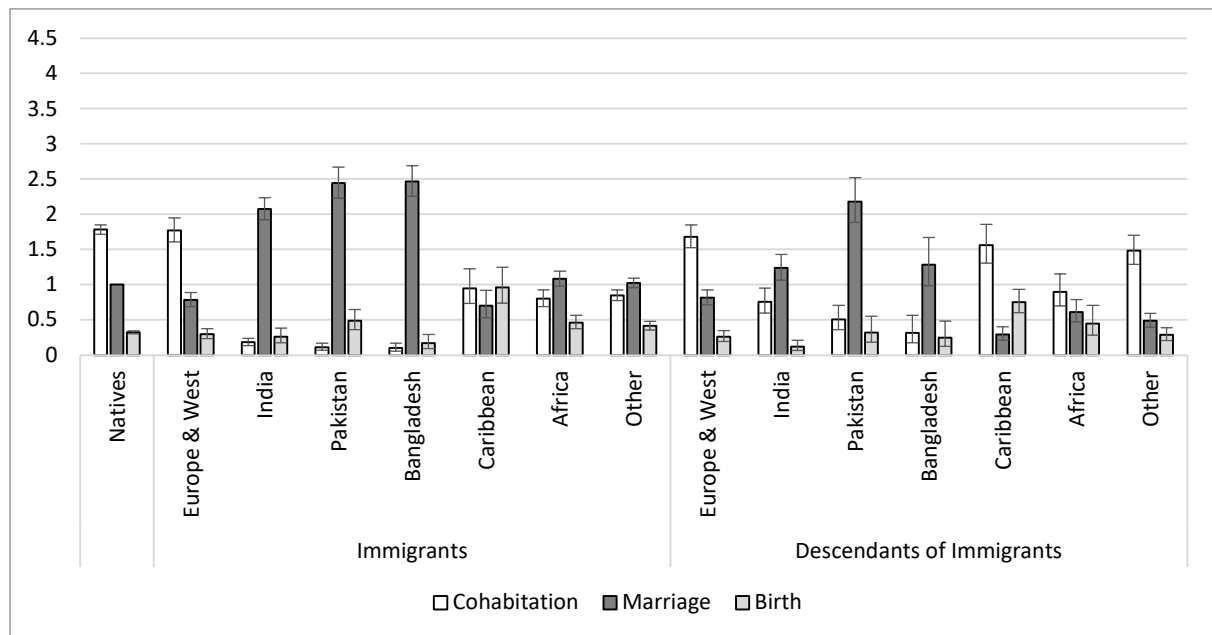
	Full sample				Employment sample			
	Model 1		Model 2a		Model 2b		Model 3	
	RR	Sig	RR	Sig	RR	Sig	RR	Sig
<i>Constant</i>	0.01	***	0.02	***	0.01	***	0.01	***
<i>Age</i>								
16-19	1.41	***	1.41	***	1.61	***	1.44	***
20-24 (ref)	1		1		1		1	
25-29	0.92	***	0.92	***	0.94	**	0.97	
30-34	0.77	***	0.77	***	0.80	***	0.84	***
35-39	0.46	***	0.46	***	0.48	***	0.52	***
40-44	0.18	***	0.18	***	0.19	***	0.21	***
45-49	0.09	***	0.09	***	0.10	***	0.10	***
<i>Birth cohort</i>								
1940-1959 (ref)	1		1		1		1	
1960-1979	1.11	***	1.12	***	1.10	***	1.24	***
1980-2003	0.94	*	0.95	*	0.98		1.02	
<i>Migrant origin x type of transition</i>								
Native x separation	0.22	***	0.22	***	0.218	***	0.22	***
1G Europe & Western x separation	0.15	***	0.15	***	0.183	***	0.18	***
1G India x separation	0.05	***	0.05	***	0.071	***	0.06	***
1G Pakistan x separation	0.08	***	0.08	***	0.118	***	0.07	***
1G Bangladesh x separation	0.05	***	0.05	***	0.09	***	0.06	***
1G Caribbean x separation	0.35	***	0.35	***	0.47	***	0.64	**
1G Africa x separation	0.16	***	0.16	***	0.20	***	0.18	***
1G Other x separation	0.15	***	0.15	***	0.17	***	0.15	***
2G Europe & Western x separation	0.26	***	0.26	***	0.25	***	0.25	***
2G India x separation	0.10	***	0.10	***	0.13	***	0.11	***
2G Pakistan x separation	0.18	***	0.18	***	0.24	***	0.18	***
2G Bangladesh x separation	0.11	***	0.11	***	0.12	***	0.09	***
2G Caribbean x separation	0.38	***	0.38	***	0.44	***	0.52	***
2G Africa x separation	0.20	***	0.20	***	0.24	***	0.26	***
2G Other x separation	0.27	***	0.27	***	0.29	***	0.29	***
Native x birth (ref)	1		1		1		1	
1G Europe & Western x birth	1.03		1.03		1.04		1.04	
1G India x birth	1.05		1.04		1.05		0.82	**
1G Pakistan x birth	1.55	***	1.54	***	1.60	***	0.98	
1G Bangladesh x birth	1.32	***	1.31	***	1.18	**	0.74	***
1G Caribbean x birth	1.05		1.05		1.00		1.35	*
1G Africa x birth	1.15	***	1.15	***	1.16	*	1.05	
1G Other x birth	1.13	***	1.13	***	1.09	*	0.95	
2G Europe & Western x birth	1.03		1.03		1.04		1.07	
2G India x birth	1.13	**	1.13	**	1.23	***	1.07	
2G Pakistan x birth	1.33	***	1.33	***	1.33	***	1.00	
2G Bangladesh x birth	1.32	**	1.32	**	1.24		0.96	
2G Caribbean x birth	1.02		1.02		1.06		1.25	
2G Africa x birth	1.14		1.14		1.15		1.25	
2G Other x birth	1.15	**	1.16	**	1.15	*	1.17	*
<i>Duration of marriage</i>								
0-1 year (ref)	1		1		1		1	
1-3 years	1.40	***	1.40	***	1.38	***	1.38	***
3-5 years	1.36	***	1.35	***	1.39	***	1.38	***
5+ years	1.00		1.00		1.00		0.97	
<i>Union order</i>								

First union (ref)	1		1		1		1	
Second or higher order union	1.39	***	1.39	***	1.38	***	1.37	***
<i>Time since previous birth</i>								
No birth (ref)	1		1		1		1	
0-1 year	0.22	***	0.22	***	0.21	***	0.10	***
1-3 years	1.45	***	1.45	***	1.50	***	0.83	***
3-5 years	1.58	***	1.57	***	1.67	***	1.07	*
5+ years	0.86	***	0.86	***	0.92	**	0.73	***
<i>Parity</i>								
Less than two children (ref)	1		1		1		1	
Two or more children	0.45	***	0.45	***	0.41	***	0.38	***
<i>Level of education</i>								
Low (ref)			1		1		1	
Medium			0.96	***	0.98		1.13	***
High			0.98		1.02		1.25	***
<i>Employment status</i>								
Full-time employed (ref)							1	
Part-time employed							1.41	***
Self-employed							1.68	***
In full-time education							1.53	***
Unemployed							2.49	***
Other							4.61	***
ln-L	-21947.9		-21941.1		-14515.0		-10335.4	
N	17263		17263		11362		11362	

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001. RR refers to relative risks. Ref indicates the reference category. Model 2a – Model 1 + education; Model 2b – same as Model 1 but estimated on the restricted sample for whom retrospective employment histories are available; Model 3 – Model 2b + employment.

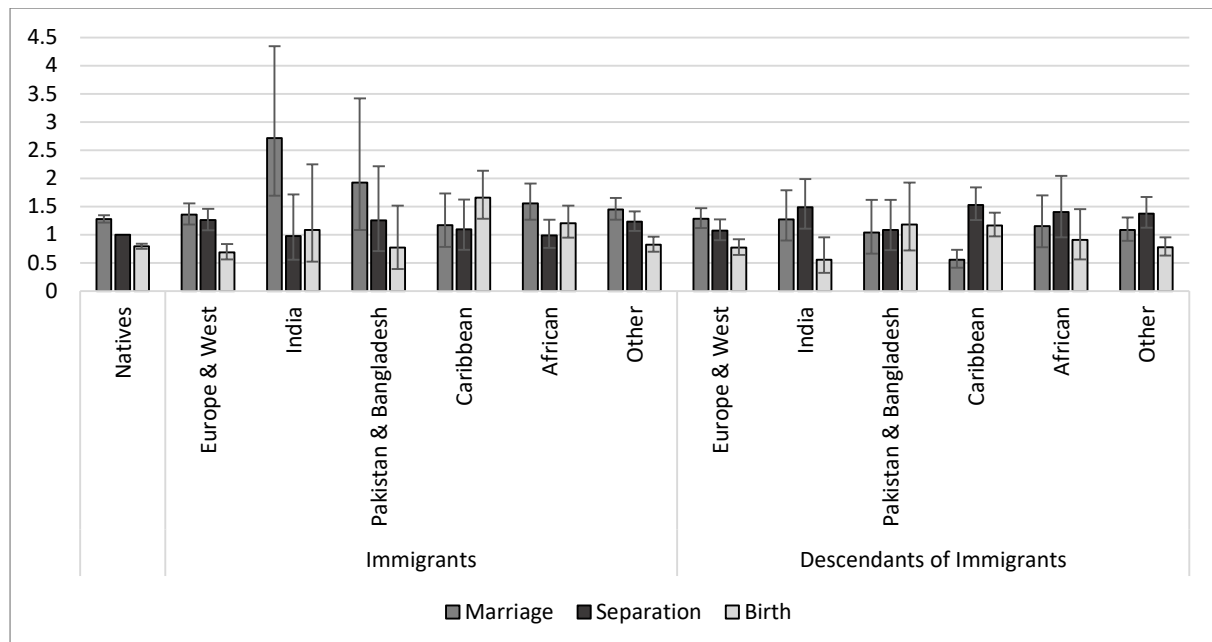
Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Appendix Figure A1 Outcomes of unpartnered men: Relative risks of cohabitation, marriage, or childbirth in the UK by migrant origin and generation



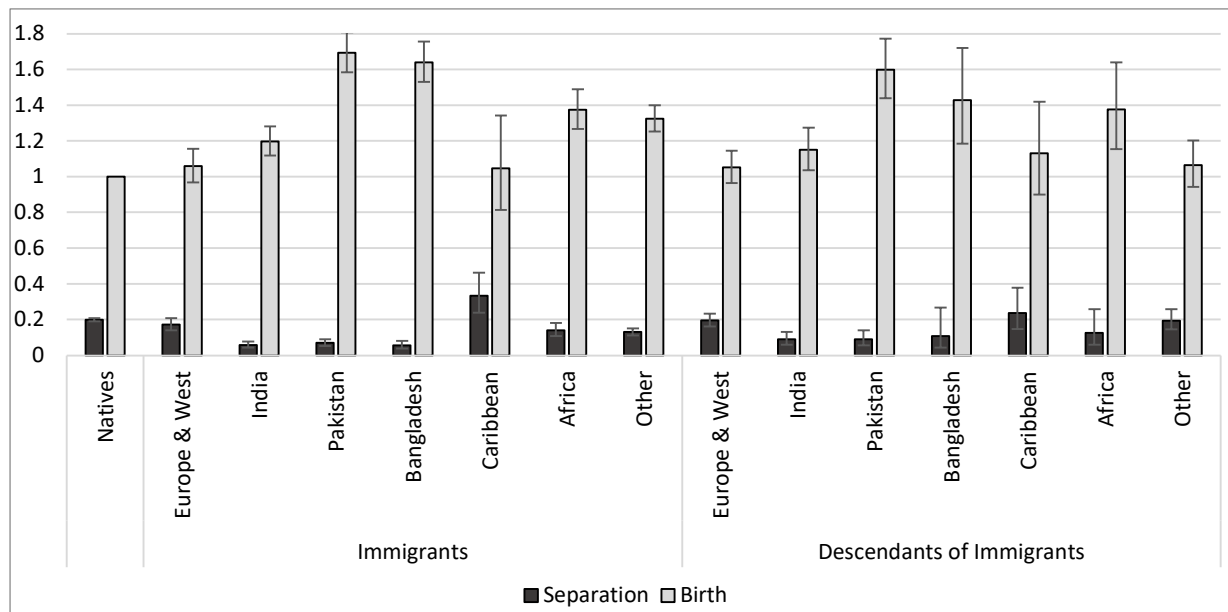
Notes: Unpartnered men refer to never partnered and/or separated men. Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to marry). The analysis is controlled for age, birth cohort, time since separation, order of separation, time since previous birth, parity, and level of education. Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Appendix Figure A2 Outcomes of cohabiting men: Relative risks of marriage, separation, or childbirth in the UK by migrant origin and generation



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to separate). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education. Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

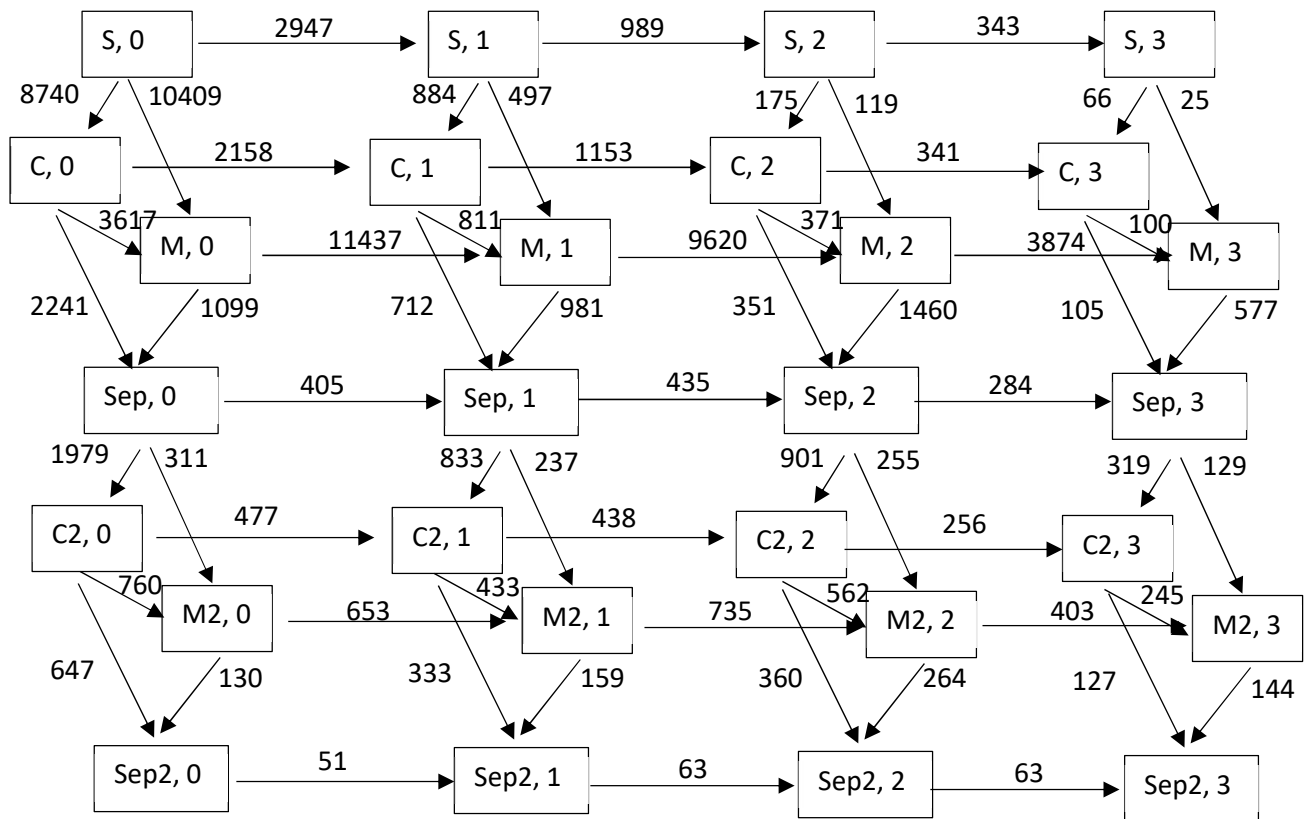
Appendix Figure A3 Outcomes of married men: Relative risks of separation or a childbirth in the UK by migrant origin and generation



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to have a child). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

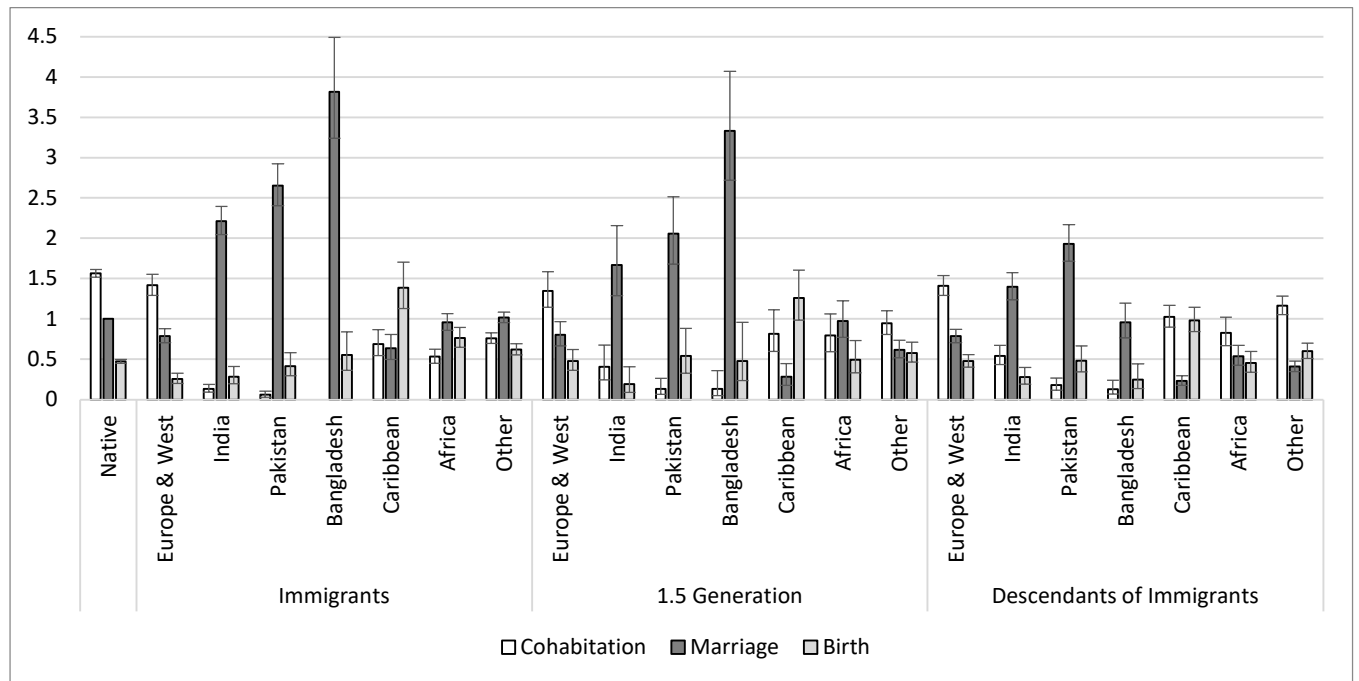
Appendix Figure A4. Number of women in the analytical sample who experienced each transition



Notes: S – never partnered; C – cohabitation; M – marriage; Sep – separation; C2 – second union which is cohabitation; M2 – second union which is marriage; Sep2 – second separation; the numbers 0–3 represent women’s parity (i.e., 0 child, 1 child, 2 children, and 3 children).

Source: Authors’ calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

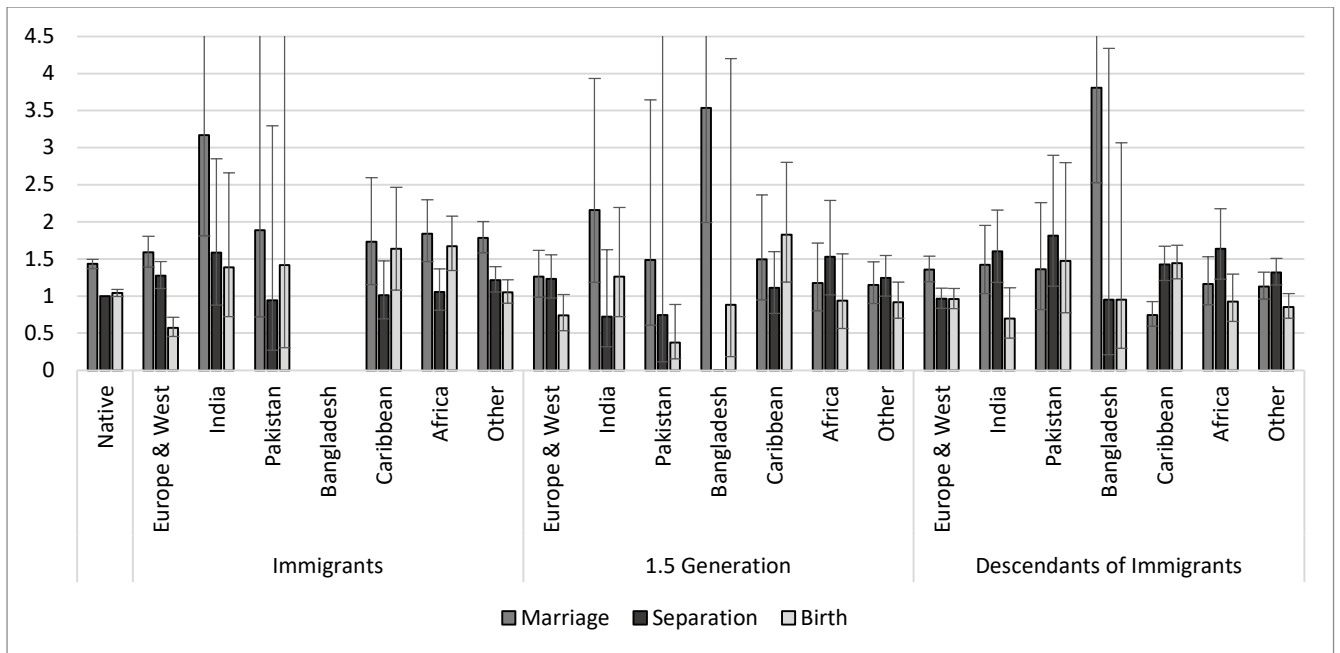
Appendix Figure A5 Outcomes of unpartnered women: Relative risks of cohabitation, marriage, or childbirth in the UK by migrant origin and generation. Distinguishing between the 1.5 generation (those who arrived in the UK aged 0-14) and first-generation immigrants (those who arrived ages 15 or over).



Notes: Unpartnered women refer to never partnered and/or separated women. Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to marry). The analysis is controlled for age, birth cohort, time since separation, order of separation, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

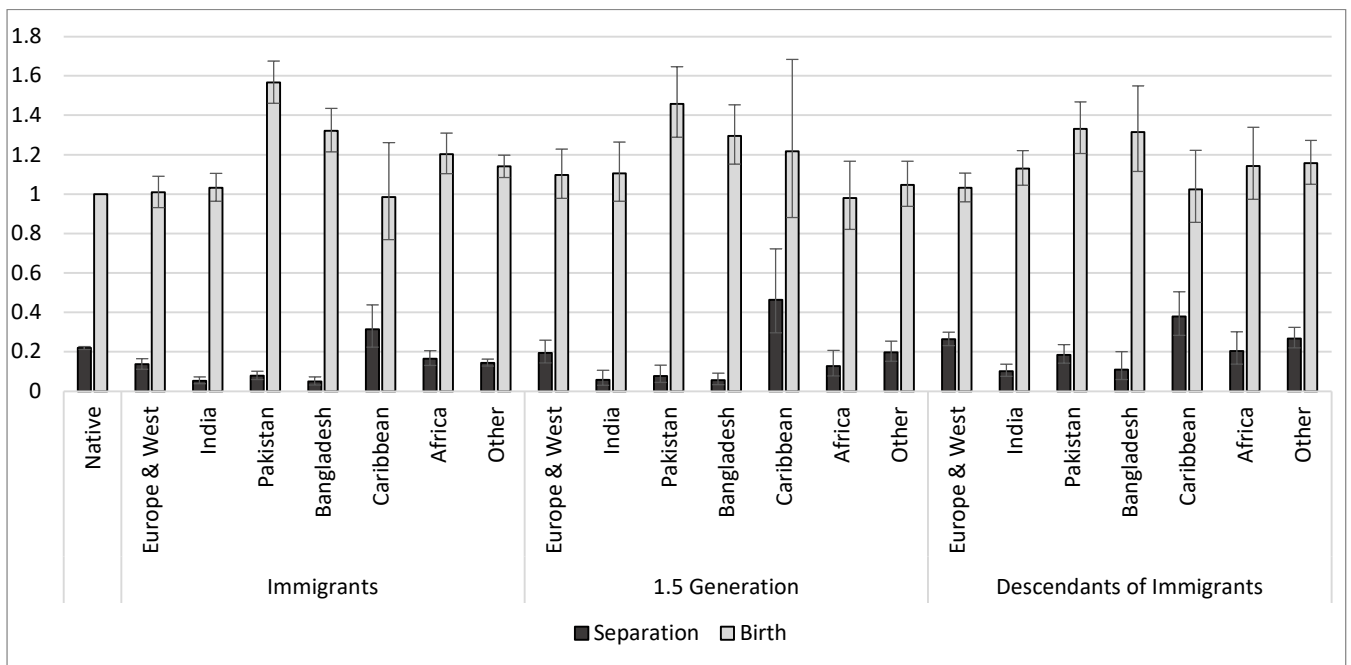
Appendix Figure A6 Outcomes of cohabiting women: Relative risks of marriage, separation, or childbirth in the UK by migrant origin and generation. Distinguishing between the 1.5 generation (those who arrived in the UK aged 0-14) and first-generation immigrants (those who arrived ages 15 or over).



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to separate). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

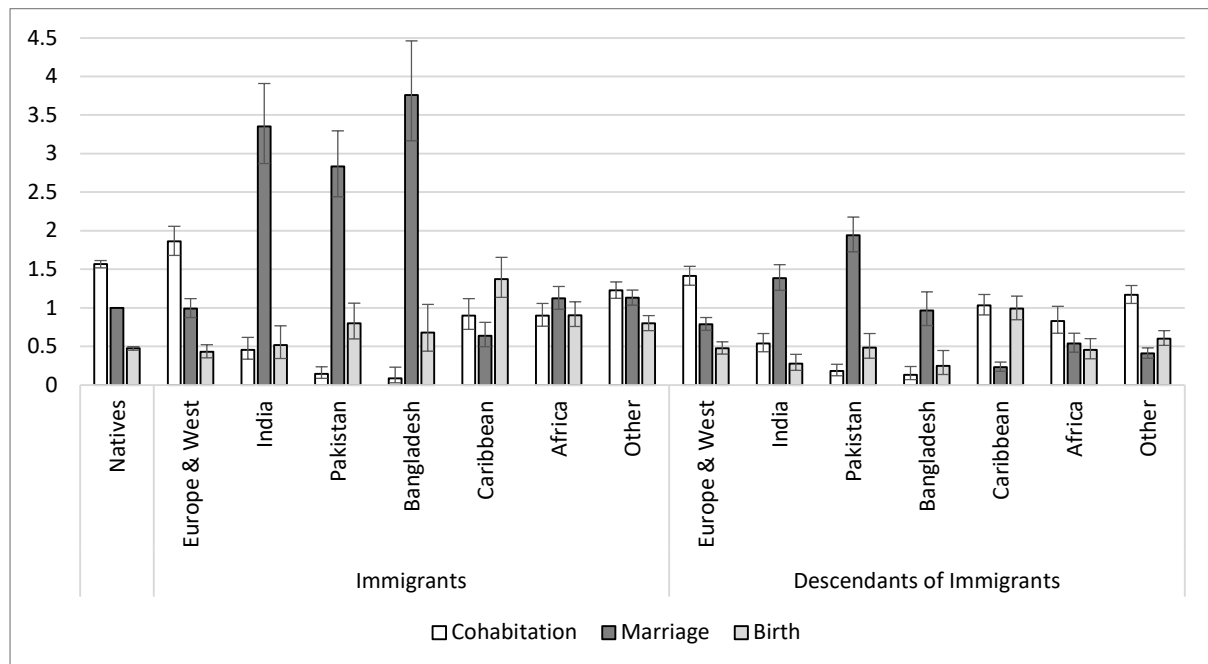
Appendix Figure A7 Outcomes of married women: Relative risks of separation or a childbirth in the UK by migrant origin and generation. Distinguishing between the 1.5 generation (those who arrived in the UK aged 0-14) and first-generation immigrants (those who arrived ages 15 or over).



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to have a child). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

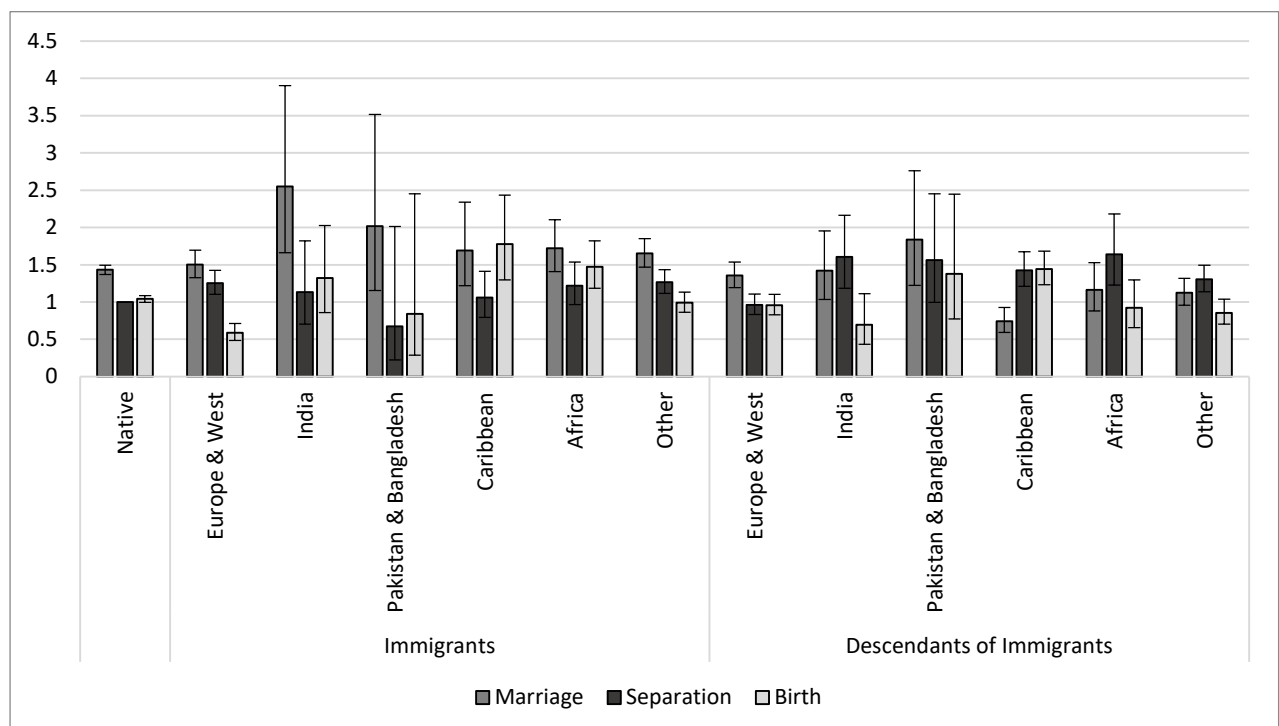
Appendix Figure A8 Outcomes of unpartnered women: Relative risks of cohabitation, marriage, or childbirth in the UK by migrant origin and generation. Excluding pre-migration episodes.



Notes: Unpartnered women refer to never partnered and/or separated women. Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to marry). The analysis is controlled for age, birth cohort, time since separation, order of separation, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

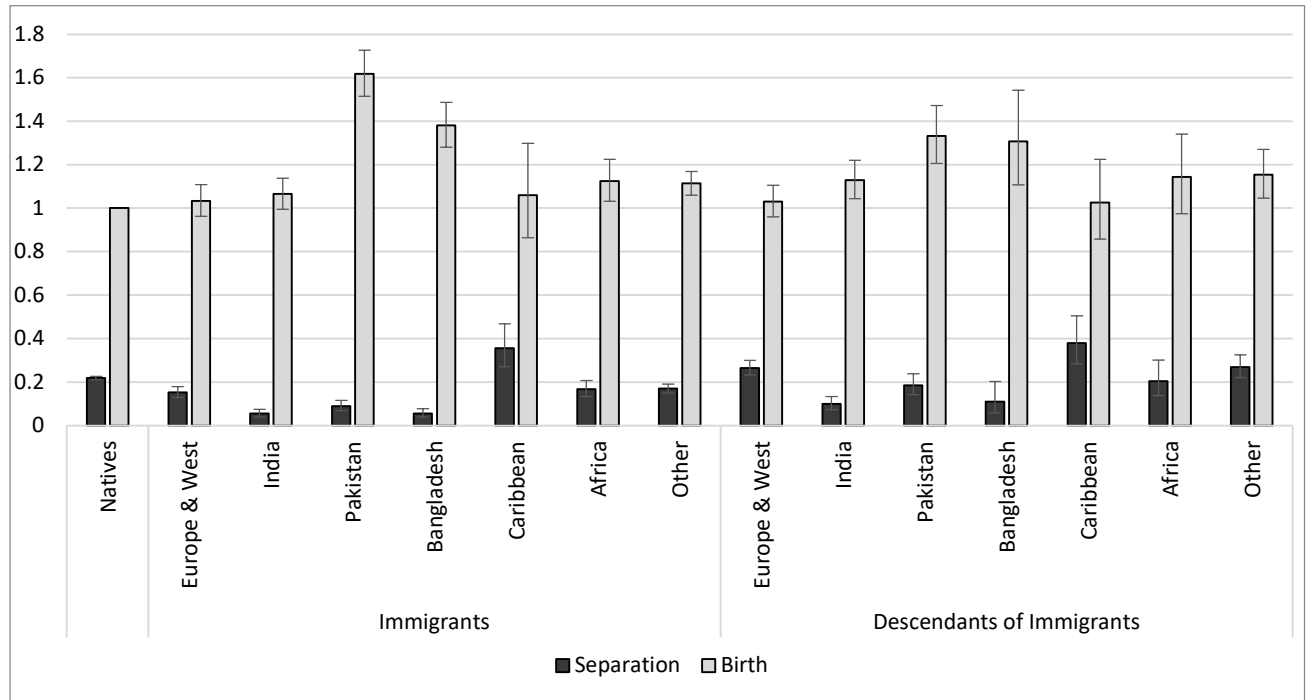
Appendix Figure A9 Outcomes of cohabiting women: Relative risks of marriage, separation, or childbirth in the UK by migrant origin and generation. Excluding pre-migration episodes.



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to separate). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

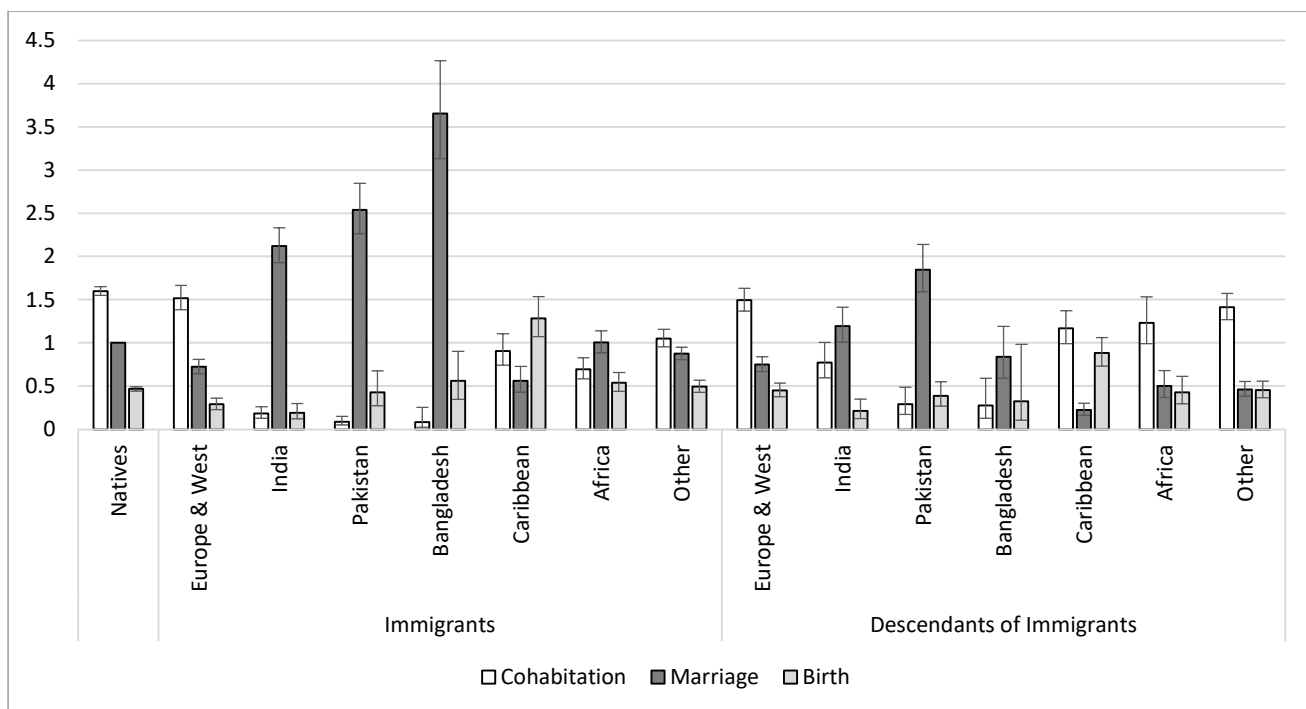
Appendix Figure A10 Outcomes of married women: Relative risks of separation or a childbirth in the UK by migrant origin and generation. Excluding pre-migration episodes.



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to have a child). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

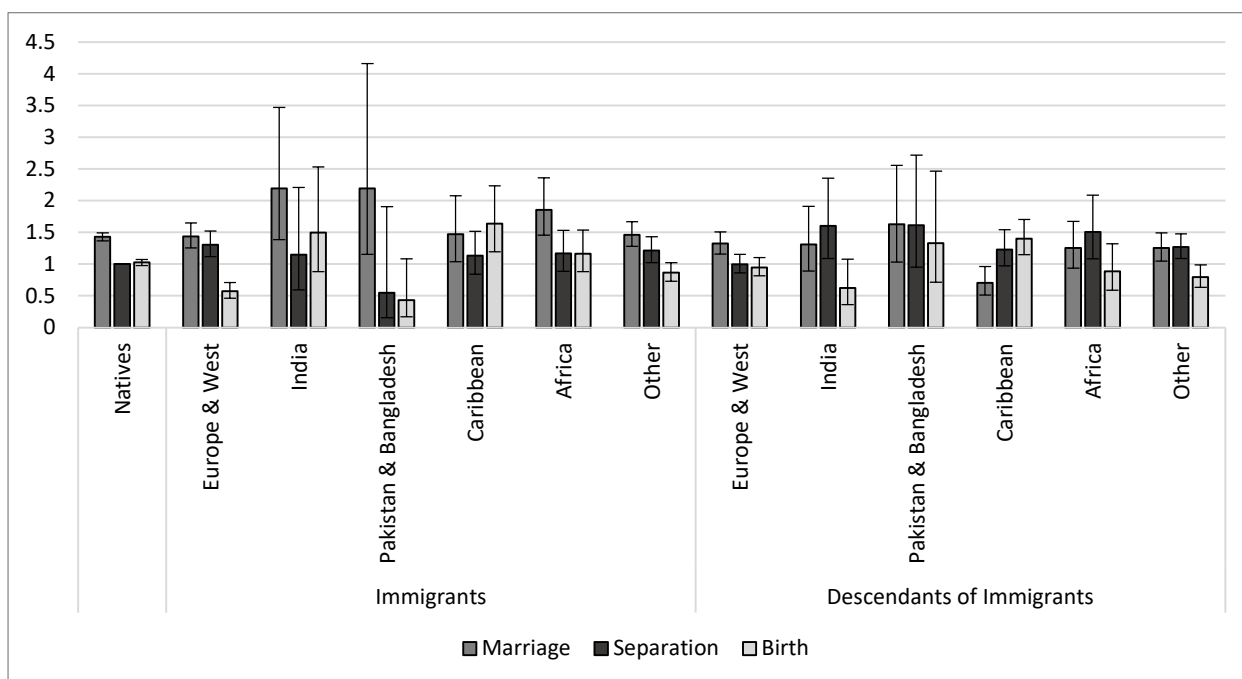
Appendix Figure A11 Outcomes of unpartnered women: Relative risks of cohabitation, marriage, or childbirth in the UK by migrant origin and generation, weighted results.



Notes: Unpartnered women refer to never partnered and/or separated women. Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to marry). The analysis is controlled for age, birth cohort, time since separation, order of separation, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

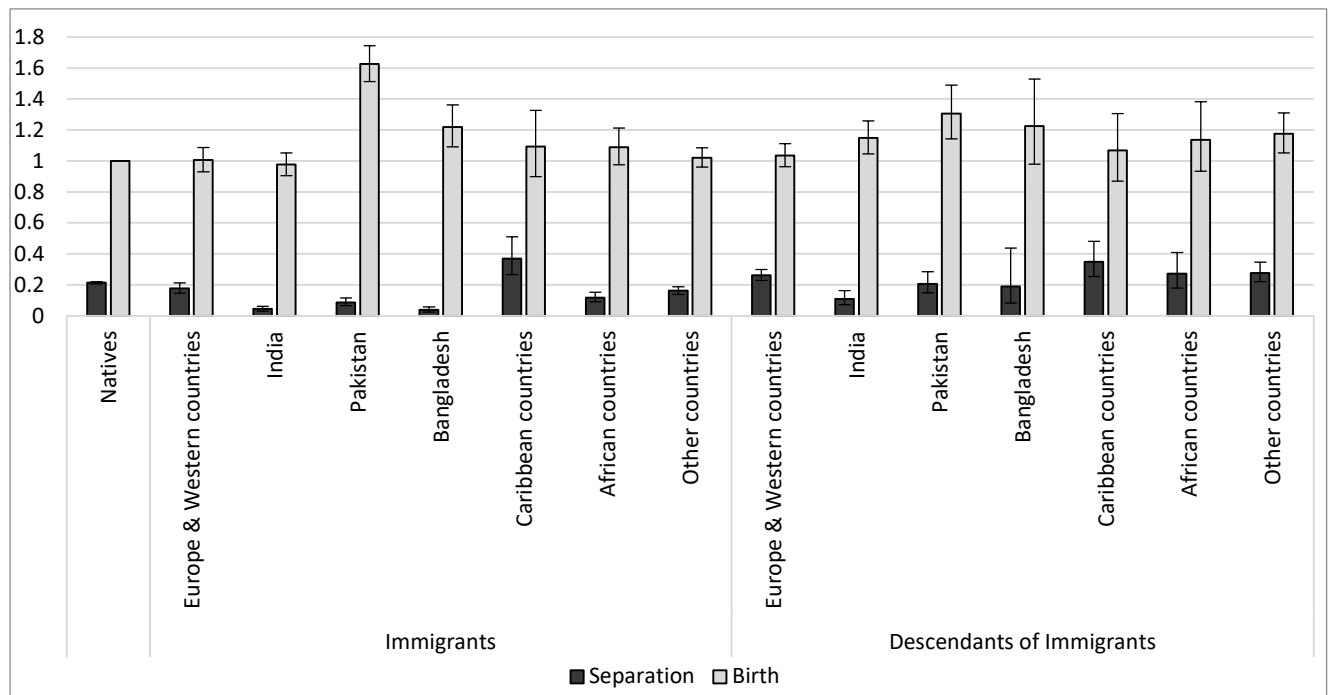
Appendix Figure A12 Outcomes of cohabiting women: Relative risks of marriage, separation, or childbirth in the UK by migrant origin and generation, weighted results.



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to separate). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.

Appendix Figure A13 Outcomes of married women: Relative risks of separation or a childbirth in the UK by migrant origin and generation, weighted results.



Notes: Whiskers indicate 95 per cent confidence intervals compared with the reference category (the risks of natives to have a child). The analysis is controlled for age, birth cohort, duration of marriage, union order, time since previous birth, parity, and level of education.

Source: Authors' calculations based on data from the UK Household Longitudinal Study (UKHLS), 2009–2019.