ISSN 2042-4116

ESRC Centre for Population Change • Working Paper 65• June 2015

CPC

centre for population change

The fertility of recent migrants to England and Wales: interrelationships between migration and birth timing

James Robards
Ann Berrington

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

ABSTRACT

Estimates of fertility for the overseas-born based on the period Total Fertility Rate (TFR) suggest that levels of childbearing are significantly higher among foreign-born women than women born in the UK. However, the inter-relationship between migration and subsequent family formation means that aggregate measures of fertility based on period TFRs may not be a useful indicator of the likely completed family size that migrant women will have at the end of their reproductive lives. The aim of this paper is to quantify levels of childbearing in the period before and after migration and hence to examine the inter-relationship between the migration event and the timing of childbearing, and whether this relationship differs by country of birth. Data from the Office for National Statistics Longitudinal Study, a 1% sample of the England and Wales population, are used to identify the reported date of arrival in the UK and to estimate childbearing prior to, and subsequent from, arrival in England and Wales. The data show that migrant groups experience low fertility rates prior to arrival (especially those arriving at young ages). Fertility rates peak in the first one to four years subsequent to arrival, especially for migrants from lower income countries. Migrants from high income countries show a delay in fertility after migration to England and Wales, and lower fertility rates, as compared to those from low income countries. We speculate that our finding of differing fertility profiles by country of birth groupings are likely to relate to the reason for migrating. Higher fertility rates for migrants from lower income countries may relate to family-related migration, whereas lower fertility among migrants originating in higher income countries may be due to employment related moves.

KEYWORDS

Migration; migrant; fertility; longitudinal data; life course.

EDITORIAL NOTE

Dr James Robards is a Research Fellow in the Care Life Cycle project funded by the Engineering and Physical Sciences Research Council and a Centre for Population Change Associate. James completed a PhD thesis on ‘Estimating the fertility of migrants to England and Wales using the Office for National Statistics Longitudinal Study’ in the Faculty of Social and Human Sciences at the University of Southampton (2012).

Ann Berrington is Professor of Demography and Social Statistics at the University of Southampton. Ann jointly coordinates the Fertility and Family strand of research at the Centre for Population Change, leading a number of projects on youth transitions, partnership formation and dissolution, and fertility dynamics.

Corresponding author: Dr James Robards, james.robards@soton.ac.uk.

ACKNOWLEDGEMENTS

The authors wish to acknowledge user support from Chris Marshall, Wei Xun, Rachel Stutchbury and staff at the Centre for Longitudinal Study Information and User Support (CeLSIUS) and assistance from Kevin Lynch, Nicola Rogers, Julian Buxton and the Office for National Statistics Longitudinal Study Development Team.

The permission of the Office for National Statistics to use the Longitudinal Study is gratefully acknowledged, as is the help provided by staff of the Centre for Longitudinal Study Information & User Support (CeLSIUS). CeLSIUS is supported by the ESRC Census of Population Programme (Award Ref: ES/K000365/1). The authors alone are responsible for the interpretation of the data. This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates. Clearance number LS30106.

The authors wish to acknowledge the support of colleagues in the Engineering and Physical Sciences Research Council (EPSRC) Care Life Cycle (CLC) project (grant number EP/H021698/1) and the Economic and Social Research Council (ESRC) Centre for Population Change (CPC) (grant number ES/K007394/1) at the University of Southampton.

© James Robards and Ann Berrington all rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

ESRC Centre for Population Change

The ESRC Centre for Population Change (CPC) is a joint initiative between the Universities of Southampton, St Andrews, Edinburgh, Stirling, Strathclyde, in partnership with the Office for National Statistics (ONS) and the National Records of Scotland (NRS). The Centre is funded by the Economic and Social Research Council (ESRC) grant numbers RES-625-28-0001 and ES/K007394/1.

This working paper series publishes independent research, not always funded through the Centre. The views and opinions expressed by authors do not necessarily reflect those of the CPC, ESRC, ONS or NRS.

The Working Paper Series is edited by Teresa McGowan.

Website | Email | Twitter | Facebook | Mendeley

THE FERTILITY OF RECENT MIGRANTS TO ENGLAND AND WALES: INTERRELATIONSHIPS BETWEEN MIGRATION AND BIRTH TIMING

TABLE OF CONTENTS

1. INTRODUCTION

The childbearing patterns of migrant groups have become of increased salience in many European countries due to the relatively low levels of fertility combined with an upsurge in international migration to the region over the past decade (Sobotka, 2008). In England and Wales increased international migration, especially since European enlargement in 2004, has been partly responsible for the sustained increase in the Total Fertility Rate (TFR) in England and Wales between 2001 and 2011, despite the economic downturn (Tromans et al., 2009; ONS, 2013a). Moreover the proportion of all births to foreign born women in England and Wales rose from 16.4% in 2001 to 25.5% in 2011 (Dormon, 2014) with concomitant implications for maternity provision, school places, housing and other services. Understanding the fertility of recent migrant groups is important for making assumptions about future levels of fertility for making projections and estimating population growth in developed countries including the UK. However, aggregate measures of migrant fertility that are based on the summation of period age-specific fertility rates can provide distorted measure of overall fertility due to the possible postponement of family formation prior to migration and a subsequent rise in fertility immediately following arrival (Kulu, 2005; Toulemon, 2004). Given the significance of international migration for predicting future population growth in England and Wales an understanding of these potential tempo-distortions in fertility is required. This paper provides some further steps towards understanding the interrelationship between migration and childbearing among international migrants to England and Wales.

2. BACKGROUND

2.1. THEORIES OF MIGRATION AND FERTILITY

The migration and fertility literature has focused on a number of competing but overlapping hypotheses to explain the observed fertility behaviour of migrants (Goldstein & Goldstein, 1981; Kulu, 2005). Early research tended to focus on explaining differences in the overall level of migrant and native fertility. Historically many migrants to western Europe came from low income regions where fertility tended to be higher than Europe. Interest focused on whether higher levels of fertility

would persist among migrants from the Indian sub-continent once they reached western Europe (Dubuc, 2012; Coleman & Dubuc, 2010). The 'socialisation hypothesis' stresses the importance of childhood environment and suggests that fertility would initially remain high among migrant groups, followed by generational convergence towards native born levels (Stephen and Bean, 1992). The 'adaptation hypothesis' suggests a quicker convergence to fertility patterns as a result of adaptation to the normative behaviour of the host population (Goldstein, 1973), whilst 'the selection hypothesis' (White et al., 1995) highlights that migrants are a select sub-population who may have different family building preferences than the majority population. Evidence consistent with all three hypotheses has been found, though the theories remain problematic in that it is often difficult to distinguish between them with empirical findings (Kulu, 2005; Waller et al., 2014).

More recently, attention has concentrated on the impact of migration on the timing of fertility. The 'disruption' hypothesis focuses on the fact that childbearing can be postponed in the time immediately before or after migration. This might occur in anticipation of migration, especially to a country where there may be benefits of a child's birth taking place in that country (e.g. citizenship or in relation to other life course transitions) and also perhaps as a result of disrupted income at the time of migration (Blau, 1992; Persson and Hoem, 2014; Adserà & Ferrer, 2014; Adserà & Ferrer, 2013). Related to the 'disruption hypothesis' is the 'family formation' or 'interrelationship of events' hypothesis, which emphasises the inter-connectedness of migration and family formation (Andersson, 2004).

Decisions regarding migration and family formation are often inter-connected, and jointly determined, especially for some migrant groups (Toulemon, 2004) leading to the conclusion that it is important to account for time since migration when studying the fertility of migrants (Andersson, 2004). This is particularly the case if there is an association between the timing of marriage/family reunification and the migration event. Childbearing in the period immediately subsequent to migration can lead to an overestimation of migrant fertility as measured by the period TFR (Dubuc, 2012; Milewski, 2010; Sobotka & Lutz, 2009; Toulemon, 2004). In other words the migration event causes a tempo distortion to the childbearing patterns of migrants

over the whole reproductive life course. The degree to which the TFR of migrant groups will be affected by this tempo effect will depend upon the inter-relationship between migration and family formation and thus will depend upon reasons for migration (Dormon, 2014; Mussino & Strozza, 2012).

2.2. UK MIGRATION CONTEXT 2001-2011

At the 2011 Census 13% of the usual residents of England and Wales reported themselves as born outside the UK and of these, one half stated that their year of arrival was during the period 2001-2011 (ONS, 2013b) reflecting the significant net international migration which occurred in this period. Between 2001 and 2011 established migration streams from the Indian sub-continent, Ireland, Germany and the United States continued. These groups were joined by increased numbers migrating from Africa (especially Nigeria, Somalia, Sierra Leone, Rwanda, Angola and Zimbabwe), Iraq and Afghanistan (Jivraj, 2013; ONS, 2012; ONS, 2013c). From 2004 net immigration of individuals who anticipated a stay of a year or longer (classified as Long Term International Migrants) increased further, with the most substantial contribution to the increase in migration to England and Wales coming from the eight eastern-central European countries who were admitted to the European Union in May 2004 (EU8 countries). The average annual inflow of EU citizens (excluding British citizens) for 2004-2012 was around 170,000, compared to 67,000 during 1997-2003 (Vargas Silva, 2014). Of the EU8 countries, migration from Poland was the most substantial and between the 2001 and 2011 Censuses the Polish-born population in England and Wales saw a ten-fold increase (ONS, 2013c).

Whilst the source of migrants coming to the UK may have diversified, the characteristic age distribution of migrants has persisted, with 86% of all long-term migrants to England and Wales in 2013 aged 15-44 (ONS[1]). In other words migrants tend to be concentrated in the key childbearing ages. Furthermore, the increase in the foreign-born population of women aged 20-24 during the period 2001-2007 came at a time when the size of the UK-born population in this age group was in decline (Tromans et al., 2009). As a result the proportion of children born in England and

[1] ONS 2014 Long Term International Migration Table 3.03b
http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-346438

Wales to foreign born women increased substantially over the last decade. However, the childbearing patterns of migrant groups are likely to differ according to reason for migration. In order to investigate whether the reasons for migration differ according to age and country of birth we present in Table 1 the number of female migrants of reproductive age (15-34) who arrived in the period 2001 to 2011 according to reason for migration, broken down by age at arrival and country of birth[2,3].

At all ages migration for work-related reasons is significantly more common among EU accession countries and to a lesser extent, migrants from the EU15. For example, among females arriving aged 25-29 in the period 2004-2011, 57% of migrants from the EU15 and 81% of EU8 migrants came for work-related reasons compared to 14% of those from the Indian subcontinent. Student migration is more important at younger ages, especially among those born in the EU15, and far less relevant for migrants from Eastern Europe. Migration as an accompanying family member, or migration to join a family member is far more common among young migrants from the Indian sub-Continent – a pattern consistent over many years (Peach, 2006) and thus we might expect rates of childbearing upon arrival to be much higher among women arriving from the Indian sub-continent than elsewhere.

[2] Since the UK attracts migrants from across the globe, the migrant regions of birth shown in Table 1 (EU15, EU8, EU2, Indian sub-continent) represent less than one third of all female migrants aged 15-34 as can be seen from the 'All' row.

[3] Note that reasons for migration are based on long term migrants' responses to the International Passenger Survey and hence are not precise but provide useful guidance concerning patterns (Disney, 2015).

	Reason for migration (percentage of each age group)												Total migrants (All reasons '000s)		
	Work Related (i.e. definite job and looking for work)			Accompany / join			Formal study			Other (inc. going home to live)					
	20-24	25-29	30-34	20-24	25-29	30-34	20-24	25-29	30-34	20-24	25-29	30-34	20-24	25-29	30-34
2001-2003															
EU15	62	56	67	0	13	33	32	25	0	6	6	0	34	16	3
EU8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EU2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indian Sub-Continent	8	36	17	75	55	67	17	0	0	0	9	17	12	12	7
Other	36	52	48	5	18	23	39	14	18	20	16	10	113	90	61
ALL	39	51	46	9	20	28	36	14	16	16	14	10	159	118	71
2004-2011															
EU15	41	57	52	2	6	19	49	34	4	8	2	26	61	47	27
EU8	83	81	80	4	6	13	10	2	0	3	11	7	73	57	16
EU2	67	67	100	0	0	0	33	33	0	0	0	0	5	4	2
Indian Sub-Continent	7	14	20	49	52	47	39	28	23	5	6	10	82	84	33
Other	20	36	46	10	17	25	55	30	17	15	17	12	325	224	135
ALL	29	40	45	14	22	27	46	26	15	11	12	13	546	416	213
2001-2011															
EU15	48	56	53	2	8	20	44	31	3	6	5	23	95	63	31
EU8	82	77	80	4	5	13	9	4	0	4	14	7	74	57	15
EU2	80	50	100	0	0	0	20	50	0	0	0	0	5	4	3
Indian Sub-Continent	7	16	20	52	52	50	37	24	20	4	8	10	95	97	40
Other	24	41	46	8	18	24	51	26	18	17	15	12	435	312	195
ALL	31	42	45	13	21	27	44	24	15	12	13	13	704	533	284

Table 1: Long-Term International Migration, Estimates from the International Passenger Survey, Female inflow by Country of Birth and Reason for Migration to England and Wales – 2001 to 2011

Source: Office for National Statistics (crown copyright), February 2015. Data from 'ad hoc' request 003908 05 March 2015.

Note: Totals may not add exactly due to rounding in the estimates. Prior to 2004 EU8 and EU2 migrants are not identified separately from "other". Zero values may indicate that the unrounded value is less than 500 persons.

2.3. UK MIGRANT FERTILITY

The proportion of all births to non-UK born women increased from 2001 to 2011. Table 2 shows the top six countries in terms of their contribution to births in England and Wales. Polish born mothers contribute the highest number of births, followed by Pakistani, Indian and Bangladeshi born women. The recent increase in migrants from Africa is reflected in Nigeria and Somalia taking the next two positions. The number of births according to migrant origin reflects both the number of foreign-born women of reproductive age who are living in England and Wales as well as their propensity to have children. Propensity to have children within particular migrant groups will reflect both longer term preferences for completed family size (the quantum of fertility), and tempo effects resulting from the circumstances surrounding, including reasons for, migration. For migrant groups who arrived in the 1960s and 1970s we can estimate completed family sizes since these cohorts will have reached the end of their reproductive years. In the British context we have seen significant assimilation of family sizes among many migrant groups such as the Indian ethnic group, however, women born in Pakistan and Bangladesh continue to have higher completed family sizes than UK-born women (Dubuc, 2012; ONS 2013d).

Top 10 non-UK countries of mother's birth (2011 Census)	Proportion of all births in England and Wales, 2011 (%) [1]	TFR in England & Wales, 2011 [1]	TFR in origin, around 2011 [2]
Poland	2.8	2.1	1.4
Pakistan	2.6	3.8	3.2
India	2.1	2.4	2.5
Bangladesh	1.2	3.3	2.2
Nigeria	1.0	3.3	6.0
Somalia	0.8	4.2	6.6
All foreign born (2011)	25.5	2.2	-

Table 2: Proportion of all births in England and Wales (2011), Total Fertility Rates (TFRs) in England and Wales and TFRs in country of birth for women born in the top six most common non-UK countries of birth living in England and Wales, 2011 Census.

Source: [1]Dormon (2014); [2]United Nations Population Division (2012) United Nations, Department of Economic and Social Affairs, Population Division (2013). World Fertility Patterns 2013 (ST/ESA/SER.A/340)http://www.un.org/en/development/desa/population/publications/fertility/fertility-patterns-2013.shtml Copyright © 2014 by United Nations. All rights reserved.

Whilst much previous research has focused on the level of childbearing among foreign born women in the UK (Coleman & Dubuc, 2010; Dubuc, 2012; Dormon, 2014; Zumpe et al., 2012) previous research has not identified the relationship between the timing of migration and the timing of childbearing both before and after the migration event. It is important to consider how this inter-relationship might differ according to reason for migration. Given the observed associations between country of birth and reason for migration (see Table 1), we would expect different tempo-effects on childbearing associated with migration according to country of birth. Comparing differences in fertility for all individual countries of birth is not possible; but considering fertility by countries of birth with similar characteristics necessitates some form of grouping. One way of doing this is to use a grouping of countries by international development, the United Nations Human Development Index (UN HDI) (UNDP, 2011), allowing comparison at a broad level of international development.

Migrants from the Indian sub-continent, particularly from Pakistan and Bangladesh often move for family formation/ reunification reasons (Ballard, 2008; Robinson et al. 2007). At younger ages then we would expect to see high rates of childbearing immediately after childbearing. At older ages (e.g. 30+ years), lower propensities for childbearing may be observed if the migration is associated with family reunification after childbearing in the country of origin. Indian migrants to England and Wales tend to be a heterogeneous group in terms of their socio-economic backgrounds and reasons for migration (Fargues & Lum, 2014). India has been a major source of migrants under the Highly Skilled Migrant programme, and in 2009 Indians made up more than one third of applicants for entry under Tier 1 of the new Points Based System implemented by the UK Government in 2008 (Migration Advisory Committee, 2009; Zuccotti, 2013). Most recently, there has been a recent surge in student migration from India. Since educational enrolment is associated with low propensities for childbearing, we would expect student migrants not to begin childbearing shortly after migration. Regarding migrants from the European Union, we have seen (Table 1) that a significant proportion of younger migrants are students, whilst older migrants (and those from the EU8 countries) are more likely to come to England and Wales for work purposes. In this scenario we might best see migration as a disruptive event if migration is associated with a change in job or a temporary

reduction in income. Moreover, we might expect a delay in childbearing for labour migrants since they are by definition coming to England and Wales to work and hence their opportunity cost of childbearing will be particularly high, at least in the short term.

In this paper we provide new insights into the fertility of migrants before and after migration to England and Wales by asking the following questions: What are the estimated fertility rates of migrants before migration based on the children they bring with them? How do fertility rates change over the first seven years subsequent to arrival in England and Wales? How does this pattern differ according to age at arrival and country of birth?

3. DATA AND METHOD

Estimation of fertility among immigrants before and after migration necessitates high quality longitudinal data on immigration and births (Kulu, 2005). The present study utilises newly available data from the 2011 Census data in the Office for National Statistics (ONS) Longitudinal Study (LS), which links information from the census, the National Health Service (NHS) patient registration data system from the Health and Social Care Information Centre and official birth registration data for a 1% sample of the population of England and Wales (ONS, 2015). We include in our analyses women who migrated in the inter-censal period (between April 2001 and March 2011).

3.1. IDENTIFYING DATE OF MIGRATION TO THE UK

At the 2011 Census the non-UK born were asked the year and month of their most recent permanent residence in the UK. These data provide a useful measure of the timing of migration which we compare with another proxy measure – date of first registration with a doctor in England and Wales (NHS registration). The date of migration is taken as the earliest of these two dates (the date from the NHS and the date reported at the 2011 Census). We centre our analyses of fertility rates on the date of migration. We estimate fertility for the five years before migration and the seven years subsequent to migration according to age at migration.

3.2. CALCULATING FERTILITY RATES PRIOR TO MIGRATION

To estimate the fertility of migrants to England and Wales we calculate fertility rates per 1,000 women for each year up to five years before migration. These are calculated for women in the key childbearing age groups at arrival in England and Wales (20-24, 25-29 and 30-34 years). We do not consider ages 15-19 years at arrival because this group will have insufficient time for childbearing prior to arrival in England and Wales. We do not consider women aged 35 years and above on arrival since the likelihood of some offspring having left home increases above this age. Furthermore, evidence suggests that these older mothers may be more likely to leave their children behind overseas when they migrate (Waller et al., 2014). In order to calculate fertility rates prior to arrival we reconstruct migrants' birth histories based upon the ages of children co-resident with women at the time of the 2011 Census. We assume that women are co-resident with all of their children. There has been some discussion in the literature about children being left behind by parents, for example migrating from Poland to England and Wales (White, 2011). However, an examination of the literature has failed to provide any quantitative evidence for this. In contrast there is much discussion of how recent migration streams from Eastern Europe have included all the family members (rather than a male household member migrating first) (White, 2009; Ryan and Sales, 2013). Furthermore, there is evidence that leaving children behind, at least in Poland, is not generally deemed acceptable (White, 2009). Minimising the risk of children being left in the country of origin is another key reason for only considering migrants aged 20-35 years at arrival. Whilst we cannot know how many births we are missing in the pre-migration period this bias will not affect the relationship between the timing of migration and the timing of subsequent births in England and Wales since these are captured within the England and Wales civil registration system and linked to the ONS LS.

3.3. CALCULATING FERTILITY RATES AFTER MIGRATION

Fertility rates per 1,000 women are calculated according to age at arrival and years since arrival, for up to 7 years after migration. The numerator for the birth rate is based on births which took place in England and Wales at each yearly duration since

arrival, and which are registered in the official birth registration system. The denominator is based on the number of women resident in England and Wales at mid-year for each year after the date of migration. When considering all migrants (according to HDI grouping) we examine fertility rates for up to 7 years subsequent to arrival. We note however, that the sample of women at longer durations since arrival becomes smaller and more select since only those who arrived in England and Wales in the early 2000s will have a duration of 7 years or more.[4] Since the accession related increases in immigration took place post 2004 we only observe Polish migrant fertility for up to five years post migration.

3.4. GROUPING SOURCE REGIONS

First we show analyses where we group all migrants according to their United Nations Human Development Index (UN HDI) in 2011 (UNDP, 2011). UN HDI provides a summary measure of achievement across a range of indices (life expectancy, education and standard of living). This has the benefit of allowing comparison to other analyses which have used this same grouping to differentiate between different streams of immigrants (Persson and Hoem, 2014; Lundström and Andersson, 2012) and allows consideration of all migrants to England and Wales in the 2001-2011 period since all countries can be coded into the HDI groupings (low, medium and high[5], and very high). For analyses by HDI we are able to extend the timeframe for which we follow-up on the fertility of migrant groups to 7 years after the date of migration because of the numbers in each group. Subsequently we focus on three key migrant groups to England and Wales which account for a significant proportion of UK births (Pakistan and Bangladesh, India and Poland). These countries also have relatively high period TFRs in 2011. Women born in Pakistan and Bangladesh are grouped because of the fact that their childbearing patterns are similar but each group has relatively small numbers.

[4] Note that we group years 5-7 to increase sample size.
[5] The medium and high countries are grouped in our analysis due to lack of sample size in the high group.

4. RESULTS

4.1. MIGRANT FERTILITY BY UN HDI COUNTRY GROUPINGS

Figure 1a shows fertility rates per 1,000 women for up to 5 years before migration and up to 7 years after migration for women aged 20-24 years at the time of migration to England and Wales by UN HDI country of birth. Before migration all migrant groups exhibit low fertility rates which rise only very slightly in the year prior to migration. In the first few years after the migration event we see lower fertility among migrants from high income countries and higher fertility among migrants from lower income countries. For migrants from countries classified as having medium and low levels of human development there are immediate increases in fertility rates 0-1 years from migration. However this immediate increase is not seen for women migrating from areas with very high levels of human development where there is a more modest increase in fertility rates with duration from migration.

There is clearly a strong association with migration to England and Wales and family formation among migrants from the least developed nations. Almost one in four women aged 20-24 at arrival in England and Wales from the fourth HDI (low) group have a live birth during the first year after migration, and this high level of childbearing continues for around the first five years following migration before declining slightly. Young women arriving from areas with medium levels of human development show a somewhat different picture – with fertility rates rising steadily from around one in ten women having a live birth in the first year following migration, to around 15% 5-7 years following migration. In contrast among young women arriving from regions with very high levels of human development fertility rates are very low in the first year following migration and increase more slowly.

Figure 1b shows the results for women aged 25-29 at the date of arrival. Similar findings are seen as for the younger age group with an immediate acceleration in fertility for the HDI4 (low human development) group in the first year following arrival. But the high rates of fertility in the first years subsequent to migration seen among women from the least developed regions is slightly lower than for women aged 20-24 at arrival – at around 200-210 births per 1,000 women. We also see a more pronounced decline in fertility rates at longer durations (i.e. 4 or more years)

post migration. Fertility rates among migrants from regions with very high levels of human development have very low rates of fertility in the first few years subsequent to migration. However, in the period 5-7 years post-migration these women, who are now aged between 30 and 36, are seen to have much higher fertility rates – around 15% of women will give birth each year.

Findings for women aged 30-34 years at arrival in the UK (Figure 1c) are slightly different: Older migrants are more likely to bring young children with them, as indicated by the somewhat higher levels of fertility in the pre-migration period, especially among those born in regions with the lowest level of human development. On arrival, rates of childbearing do increase as compared to the levels in the pre-migration period, but the overall level of childbearing is much lower than for young women, particularly for women born in countries classified in HDI group 4. Among women born in countries classified as having a very high level of human development, rates of childbearing are low in the years prior to migration, but drop even further in the first year following migration, before increasing to a level whereby one in ten women has a birth each year. Thus, among migrants from the most developed countries, those who arrive in England and Wales in their early thirties have raised fertility. Indeed in the period 5-7 years subsequent to migration when these women were aged 35-41, it is those who originated in countries with the highest levels of human development which have the highest fertility rates.

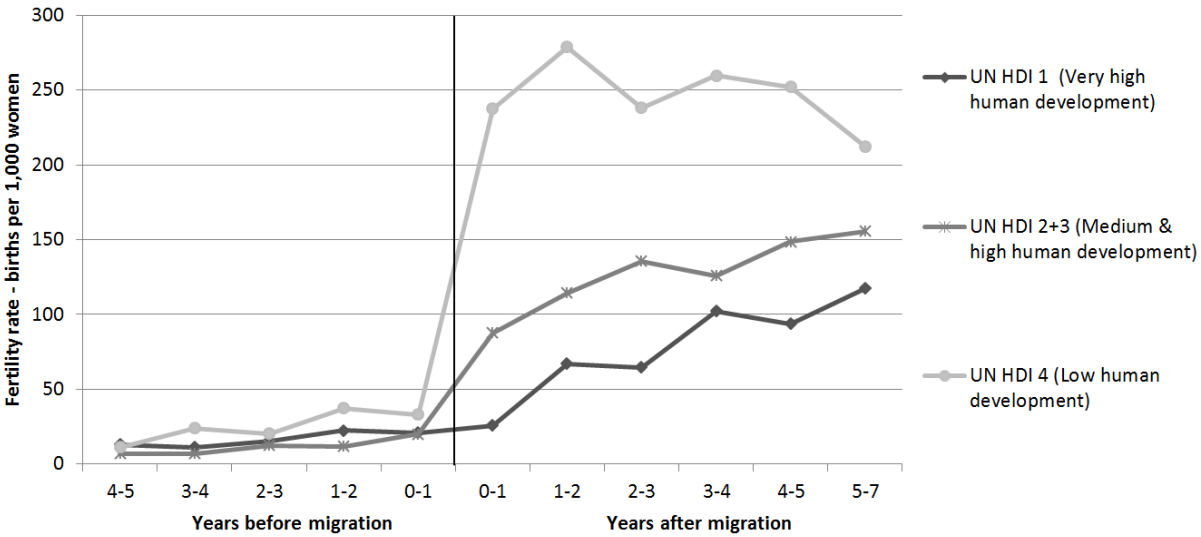

Figure 1a: Fertility rates before and after migration for female migrants to England and Wales per 1,000 women aged 20-24 years at date of migration to England and Wales by United Nations Human Development Index country of birth

Source: Authors' own analysis of ONS LS.

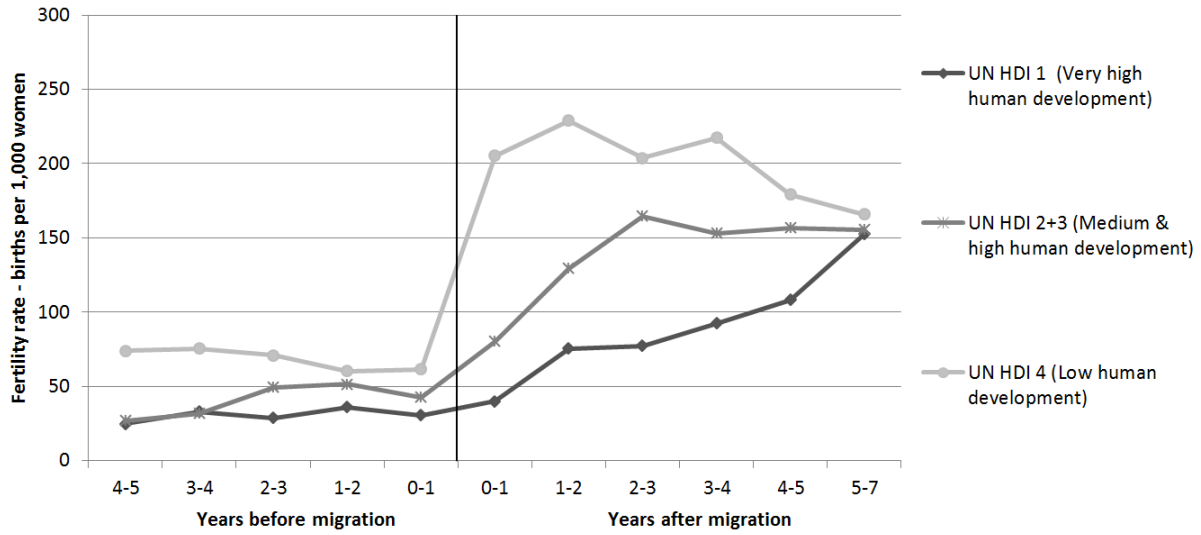

Figure 1b: Fertility rates before and after migration for female migrants to England and Wales per 1,000 women aged 25-29 years at date of migration to England and Wales by United Nations Human Development Index country of birth

Source: Authors' own analysis of ONS LS.

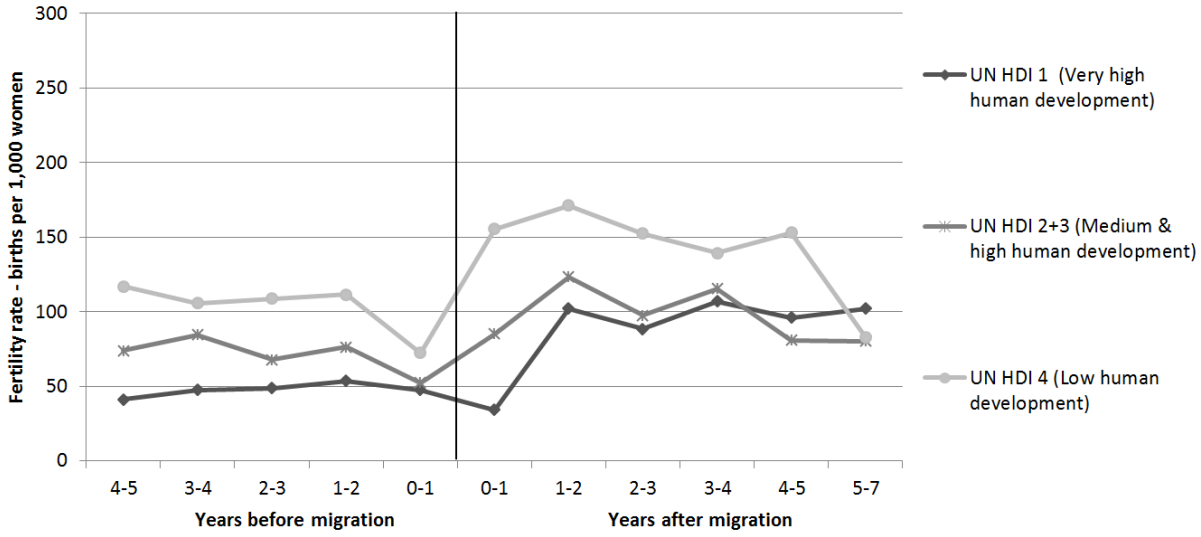

Figure 1c: Fertility rates before and after migration for female migrants to England and Wales per 1,000 women aged 30-34 years at date of migration to England and Wales by United Nations Human Development Index country of birth

Source: Authors' own analysis of ONS LS.

4.2. FERTILITY PATTERNS FOR KEY ORIGIN COUNTRIES

Given the key role that just a few source countries have played in increasing the overall proportion of births in England and Wales that occur to foreign-born women, we now consider the patterns for migrants born in India, Pakistan & Bangladesh and Poland who arrived in England and Wales between 2001 and 2011 at ages 20-24, 25-29 and 30-34 (Figures 2a-2c). It is important to consider Indian women separately from Pakistani and Bangladeshi women since past research has found significantly different fertility patterns within the South Asian group. Ideally we would like to analyse the fertility of Pakistani and Bangladeshi women separately, especially since we know that there has been a larger decline in period fertility in Bangladesh than in Pakistan. Recall in Table 1 that the 2011 TFR for Pakistan is estimated to be around 3.2 compared with around 2.2 in Bangladesh[6]. Unfortunately however, the sample sizes are not sufficient and so they are grouped together. This grouping can be defended however, on the basis that fertility rates in the UK among Pakistani and Bangladeshi born women are relatively similar, and tend to be higher than those of Indian born women (Coleman & Dubuc, 2010). Since Polish migration only really took off after the accession of Poland to the European Union in 2004, the longest

[6] We note that Pakistani and Bangladeshi migrants to the UK have traditionally come from particular rural areas and so national TFRs may not be that representative of these migrant groups.

duration which we can observe these migrants after their arrival in the UK is five years.

For all women arriving at age 20-24, fertility prior to migration (at least as measured by the number of children women brought with them) is very low (Figure 2a). Once arrived in England and Wales however, there are significant differences in the fertility behaviour of young Indian women (who have low to moderate levels of fertility) and Pakistani and Bangladeshi women (who display very high fertility rates in the first few years subsequent to migration). One third of Pakistani & Bangladeshi women had a birth in the first year following arrival. This elevated childbearing propensity is higher than the average for all countries in the HDI 4 low levels of human development group and is likely to be related to the family formation related reasons for migration among these groups of young women. For women aged in their early twenties at arrival fertility rates remain high for at least the first five years – which is not surprising given that they are in the prime childbearing age range during this period. Fertility rates among Indian-born migrants aged 20-24 at arrival are much lower, and more so among Polish-born women in the first year following migration. Fertility rates then rise slowly during the subsequent years for the Indian-born and Polish-born.

Figure 2b shows fertility rates for migrants aged 25-29 years at the time of migration. The overall pattern is fairly similar to the younger age group, with Indian and Polish born migrants having lower fertility rates than those from Pakistan and Bangladeshi. Of particular note is the way in which fertility rates for Pakistani and Bangladeshi born women start to fall in the third year following migration consistent with a close inter-relationship between the migration event and family building. There is slight evidence consistent with a reduction in fertility just prior to the migration event for female migrants born in India and Poland. This temporary reduction in fertility around the time of the migration event is more apparent for women who arrive at ages 30-34 (Figure 2c). Among those arriving in their early thirties we see a much flatter fertility profile with rates of childbearing similar or even higher in the period prior to migration. Although fertility rates do rise in the immediate year following migration for Pakistani-born and Bangladeshi-born women the rate is only

just over 200 per thousand (compared to around 350 per 1,000 for female migrants in their early 20s).

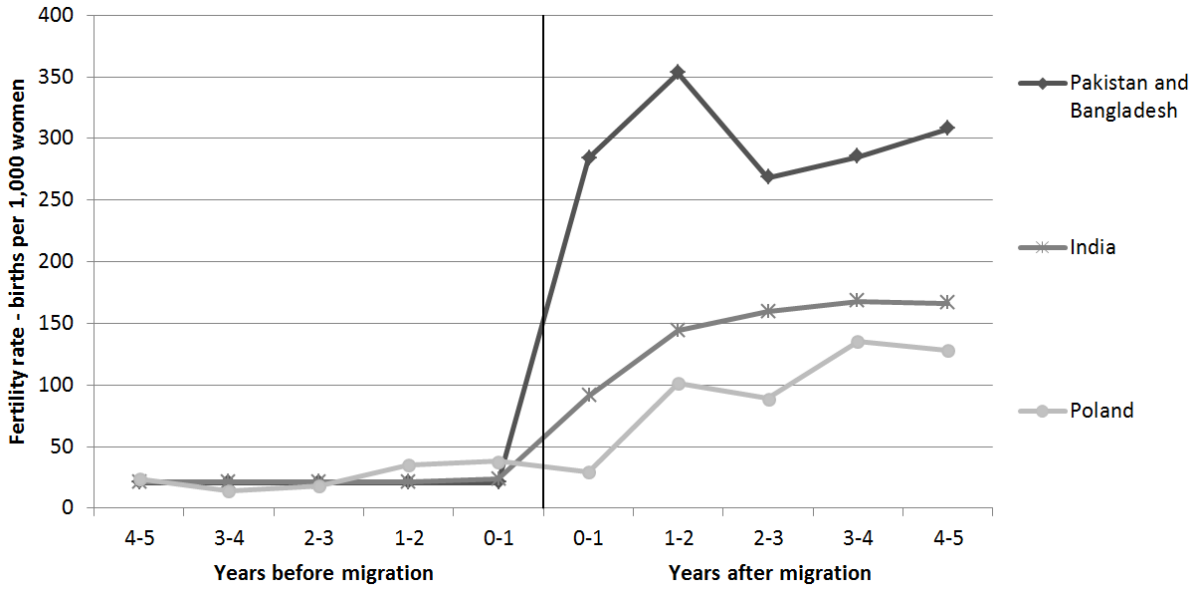

Figure 2a: Fertility rates before and after migration for female migrants to England and Wales per 1,000 women aged 20-24 years at date of migration to England and Wales by country of birth.

Source: Authors' own analysis of ONS LS.

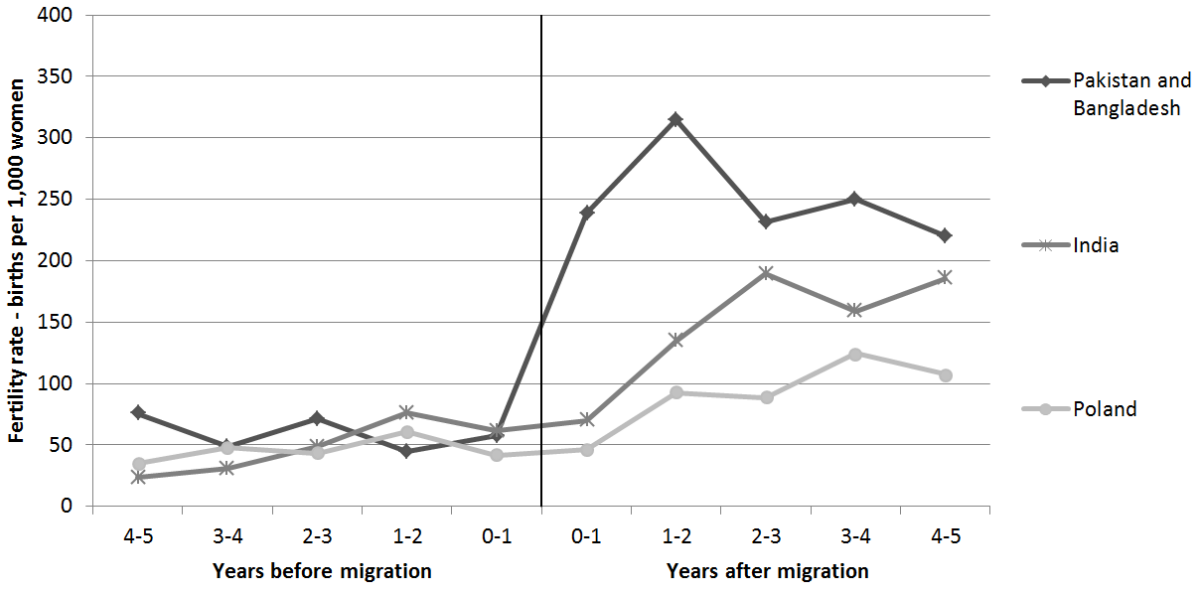

Figure 2b: Fertility rates before and after migration for female migrants to England and Wales per 1,000 women aged 25-29 years at date of migration to England and Wales by country of birth.

Source: Authors' own analysis of ONS LS.

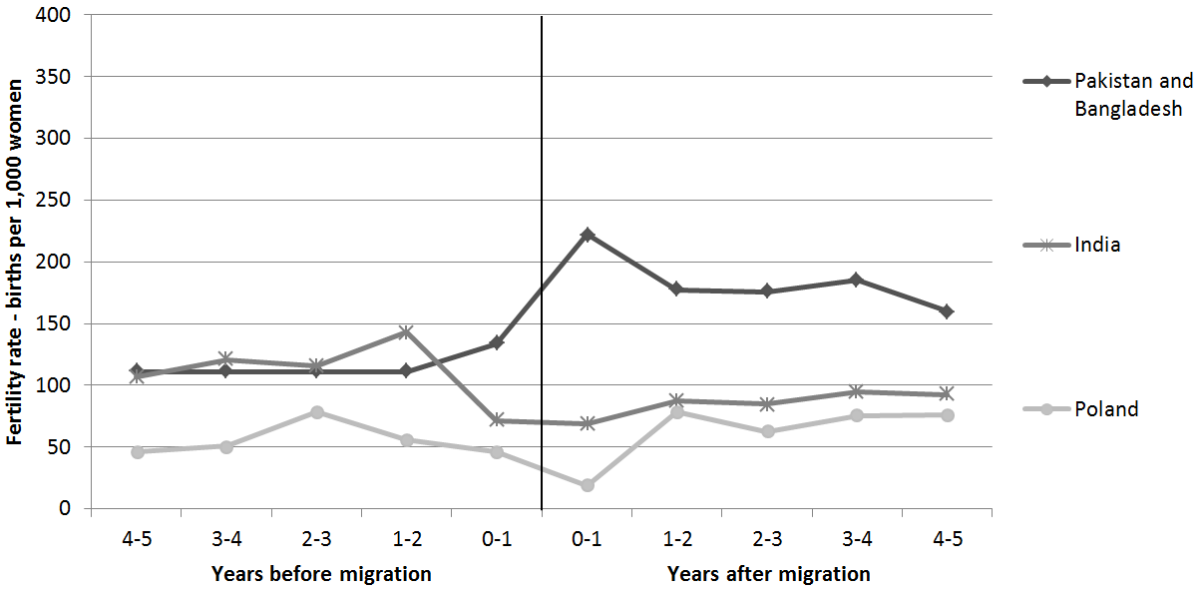

Figure 2c: Fertility rates before and after migration for female migrants to England and Wales per 1,000 women aged 30-34 years at date of migration to England and Wales by country of birth

Source: Authors' own analysis of ONS LS.

In summary we find evidence for a strong inter-relationship between migration and family building, especially for Pakistani-born and Bangladeshi-born women arriving in the England and Wales in their early to mid-twenties. These high rates of childbearing seen in the first few years following migration among women from lower income countries are not sustained when we examine longer durations since migration suggesting a strong temporary effect that has the potential to distort period measures of fertility such as the TFR. There is also some evidence from other migrant source regions, in support of the disruption hypothesis, whereby fertility is lower around the time of migration. This decrease in childbearing around the time of migration (before and after) is especially seen among Polish-born migrants, but also for older Indian women arriving in their early thirties. For older Indian-born migrants, rates of childbearing in England and Wales are actually lower than in the years prior to migration. These women are thus bringing their children with them. We cannot tell from the data available whether the low fertility rates prior to migration for the Polish group are real, or whether they reflect the fact that some women may not have brought their children to live with them in the England and Wales.

5. DISCUSSION AND CONCLUSION

This research has provided new insights into the timing of fertility among migrants who arrived in England and Wales between 2001 and 2011. The timing of childbearing in relation to the migration event has not previously been studied in England and Wales due to a lack of accurate data on both the timing of migration and tempo of childbearing. Our findings suggest that the relationship between migration and family building differs markedly according to country of birth, and age at arrival in England and Wales. These differences are likely to reflect the distinct reasons for migration of alternative groups, although we cannot test this directly with the available data. Younger (20-29 years) migrants born in less developed countries are seen to have low levels of childbearing prior to migration, but elevated fertility rates in the first few years subsequent to migration. Eventually, however, fertility rates at longer durations (5-7 years) post migration tend to decline to levels more similar to those found among migrants from more developed regions. This pattern is typical of migrants born in Pakistan and Bangladesh whom are more likely to migrate for family reasons. Younger migrants from countries classified as having a high human development and Indian-born migrants tend to have low levels of fertility both prior to and immediately following migration. Again this probably relates to the higher likelihood of migrating for education and work related reasons. However, these differences in birth timing among younger migrants may also reflect different age preferences for childbearing according to cultural and educational background. Among Polish women for example, fertility postponement is now the norm in their country of origin (Kotowska et al., 2008). Hence it is difficult to know whether the low rates of fertility among young Polish migrants is a function of a disruption effect of migration, the selection of particular types of women in to migration, or the more general postponement of fertility to older ages among Polish women (or a mixture of all three explanations). This underscores some of the complexity concerning theory on the interrelationship between migration and fertility.

This research has some limitations. Firstly, the sample consists of ONS LS members who were present at the 2011 Census. Hence we do not include individuals who migrated to the UK, but also emigrated before the 2011 Census. Secondly, the 2011 Census asked about the country of birth and not the country of last residence.

We are thus assuming that migrants born in India, or in Poland, for example have migrated directly from India to the UK. We consider that this is a reasonable assumption since we study the key age groups who migrate (Rogers and Castro, 1981) and consider individual countries which have strong and on-going migration linkages with England and Wales. Thirdly, we do not know about children left in the country of origin. This means that our estimates of fertility prior to arrival may be underestimated. We believe that this bias will be more important for those migrating in their early thirties because migration for work-related reasons at these ages could lead to children being left in the country of origin. Nevertheless, this does not affect fertility rates subsequent to arrival which are identified using data within the birth registration system. Fourthly, there are other countries with high TFRs (notably Nigeria and Somalia) where fertility in relation to migration needs considering but where increases in migration flows were more recent to 2011 but for whom we have insufficient sample sizes to estimate their fertility.

Notwithstanding these caveats, this paper provides important evidence as to how age at migration and country of birth are crucial in affecting pre- and post-migration fertility. This is likely to be the result of the importance of the reason for migration which differs systematically by age and country of birth.[7] How do our findings relate to existing theories of the impact of migration on the timing of childbearing? Our conclusions are that: all three theories (family formation or interrelationship of events, selection, and disruption) are useful in understanding the observed trends; different theories are important for different migrant groups; and that often it is difficult to tease out the relative importance of these hypothesized mechanisms since they predict similar empirical patterns. Similar to previous findings from France (Toulemon, 2004), Sweden, (Persson and Hoem, 2014) and Norway (Østby, 2002) a sharp increase in fertility was identified in years immediately after migration for migrants from low income countries of origin. Such a pattern can be consistent with both the disruption of events hypothesis if, for example, fertility among coupled women is being postponed until after arrival (e.g. in anticipation of advantages accruing from a child being born in the host country). But exactly the

[7] Whilst we cannot identify reason for migration explicitly from our migrant sample, we can use age at arrival and country of birth as a proxy given auxiliary information from other data sources on the reasons for migration by age and region of birth (Table 1).

same empirical pattern is consistent with the inter-relationship of events hypothesis which expects fertility to be high among women who migrate to the UK for the purposes of family formation or reunification.

In contrast, women moving for work-related reasons e.g. from Poland and UN HDI 1 (very high development) countries of birth appear to delay childbearing until some years after migration. Similar findings have been made in Italy (Mussino and Strozza, 2012). This delay in childbearing could be interpreted as an inter-relationship of events since the migration event is associated with a transition in education or work role. These women may however, also be very selective in their family orientation since they may be prioritising a geographic move for study/work reasons. Among those who migrate for non-family related reasons it is possible that we are seeing a longer-term life course transition to family formation (some years after migration). Increases in fertility at longer durations since migration may also be anticipated in order to meet fertility preferences over the longer term. Migrants from high income countries who arrive for education and work reasons in their thirties may exhibit higher fertility at shorter durations after migration due to the constraints arising from the end of the female reproductive age range. That is to say, there is not much time to delay their births.

Given the findings of this study, questions should be posed as to whether the period Total Fertility Rate (TFR) is an appropriate summary measure of migrant fertility. This is because of the tempo distortion in childbearing associated with the migration event. The TFR sums the observed age-specific fertility rates observed for a migrant group within a calendar year. The TFR equates to the number of births a woman would end up with if she went through her reproductive life experiencing the age specific fertility rates observed within a particular calendar year. However, there can be biases arising from the age-specific nature of migration and the age and duration-specific fertility of migrants since migration. Especially when migration is associated with high fertility on arrival, an increase in rates of migration, can inflate the TFR by increasing the number of women with short durations of stay when their fertility rates are highest therefore exaggerating the fertility quantum (Sobotka & Lutz, (2009). In the present study, consistent with Parrado (2011), disruption of

fertility prior to arrival and subsequent high rates on arrival among migrants from lower income countries is found to relate to the migration process which could lead to distortions in predicted growth of migrant groups.

Thus the relatively high period TFRs according to country of birth shown in Table 2 and discussed by Dormon (2014) may be inflated due to tempo distortions associated with increased migration rates in the latter part of the 2000s. This inflation could explain the higher TFRs observed for some of the migrant groups in comparison to their country of origin. This effect is likely to be particularly strong for migrant groups who tend to migrate for family-related regions such as those from Pakistan and Bangladesh. But it may also be having an impact on the TFR for women born in high income countries. The TFR for Polish-born migrants in England and Wales was 2.1 compared to a TFR of 1.4 for the same year (2011) in Poland. Moreover Dormon (2014) highlights the period TFR for Romanian migrants as being particularly high with the highest TFR of any EU country of birth in 2011 with a TFR of 2.93 in England and Wales compared to a TFR of 1.25 in Romania. Given the recent accession of Romania to the EU in 2007 and subsequent increase in migration, if Romanian migrants had a similar fertility profile by age at arrival and duration since migration to migrants from other high UN HDI countries (as shown in this study) then it is possible that their duration and age-specific fertility rates would be quite high 2-4 years since migration (in 2011) potentially resulting in an inflated TFR. This said we also need to be mindful of the fact that migrants to the UK are select for a number of characteristics and further research is required to understand whether the true quantum of fertility for foreign-born women living in the UK is higher than for their contemporaries remaining in the home countries. Unfortunately such data require us to be able to observe migrants through to the end of their reproductive life times. In the meantime, the sorts of analyses presented here provide strong evidence of an inter-relationship between migration and the timing of fertility that must be borne in mind when interpreting period measures of fertility among recent migrants.

REFERENCES

Adserà, A. and Ferrer, A. (2014) The Fertility of Married Immigrant Women to Canada. *International Migration Review,* (Online first view), doi.org/10.1111/imre.12114.

Adserà, A. and Ferrer, A. (2013) The Fertility of Recent Immigrants to Canada. *IZA working paper 7289*, http://ftp.iza.org/dp7289.pdf.

Andersson, G. (2004) Childbearing after migration: Fertility patterns of foreign-born women in Sweden. *International Migration Review*, 38 (2), 747-774.

Ballard, R. (2008) "Inside and outside: Contrasting perspectives on the dynamics of kinship and marriage in contemporary South Asian transnational networks." In Grillo, R. (ed.) The family in question: Immigrants and minorities in multicultural Europe. Amsterdam: Amsterdam University Press, pp 37-70.

Blau, F.D. (1992) "The Fertility of Immigrant Women: Evidence from High Fertility Source Countries." In Borjas, G.J. and Freeman, R.B. (eds.) *Immigration and the Work Force: Economic Consequences for the United States and Source Areas*. Chicago: UCP, pp 93-133.

Disney, G. (2015) *Model-Based Estimates of UK Immigration.* University of Southampton, Social Sciences, Doctoral Thesis , 210pp.

Coleman, D.A. and Dubuc, S. (2010) The fertility of ethnic minorities in the UK, 1960s–2006. *Population Studies,* 64 (1), 19-41.

Dormon, O. (2014) *Childbearing of UK and non-UK born women living in the UK - 2011 Census data.* Office for National Statistics. http://www.ons.gov.uk/ons/rel/fertility-analysis/childbearing-of-uk-and-non-uk-born-women-living-in-the-uk/2011-census-data/article--childbearing-of-uk-and-non-uk-born-women-in-england-and-wales-using-2011-census-data.html.

Dubuc, S. (2012) Immigration to the UK from high-fertility countries: Intergenerational adaptation and fertility convergence, *Population and Development Review*, 38 (2), 353-368.

Fargues, P. and Lum, K. (2014) *India-EU migration: a relationship with untapped potential*. Migration Policy Centre; CARIM-India Research Report; 2014/01, http://hdl.handle.net/1814/31305.

Ford, K. (1990) Duration of Residence in the United-States and the Fertility of United-States Immigrants, *International Migration Review,* **24,** 1, 34-68.

Goldstein, S. (1973) Interrelations between migration and fertility in Thailand, *Demography,* 10(2): 225–241.

Goldstein, S. and Goldstein, A. (1981) The Impact of Migration on Fertility - an Own Children Analysis for Thailand. *Population Studies-a Journal of Demography*, 35 (2), 265-284.

Jivraj, S. (2013) *How can we count immigration and integration? Dynamics of Diversity: Evidence from the 2011 Census.* Prepared by ESRC Centre on Dynamics of Ethnicity (CoDE), January 2013. http://www.ethnicity.ac.uk/medialibrary/briefings/dynamicsofdiversity/how-can-we-count-immigration-and-integration.pdf.

Kotowska, I., Jóźwiak, J., Matysiak, A. and Baranowska, A. (2008) Poland: Fertility decline as a response to profound societal and labour market changes. *Demographic Research,* 19 (22), 795-854.

Kulu, H. (2005) Migration and Fertility: Competing Hypotheses Re-examined. *European Journal of Population,* 21 (1), 51-87.

Lundström, K.E. and Andersson, G. (2012) Labor-market status, migrant status and first childbearing in Sweden. *Demographic Research,* 27 (25), 719-742.

Migration Advisory Committee (2009) *Analysis of the Points Based System: Tier 1.* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/257267/mac-december-09.pdf.

Milewski, N. (2010) *Fertility of Immigrants: A Two-Generational Approach in Germany,* Berlin, Springer.

Mussino, E. and Strozza, S. (2012) The fertility of immigrants after arrival: The Italian case. *Demographic Research*, 26 (4), 99-130.

Office for National Statistics (2012) *International Migrants in England and Wales 2011.* http://www.ons.gov.uk/ons/dcp171776_290335.pdf.

Office for National Statistics (2013a) *Why has the fertility rate risen over the last decade in England and Wales?* http://www.ons.gov.uk/ons/rel/vsob1/birth-summary-tables--england-and-wales/2011--final-/sty-fertility.html.

Office for National Statistics (2013b) *Immigration Patterns of Non-UK Born Populations in England and Wales in 2011?* http://www.ons.gov.uk/ons/dcp171776_346219.pdf.

Office for National Statistics (2013c) *Immigration Patterns of Non-UK Born Populations in England and Wales in 2011.* http://www.ons.gov.uk/ons/dcp171776_346219.pdf.

Office for National Statistics (2013d) *Family size in 2012.* www.ons.gov.uk/ons/rel/family-demography/family-size/2012/family-size-pdf.pdf

Office for National Statistics (2014) Long Term International Migration Table 3.03b. http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-346438.

Office for National Statistics (2015) Longitudinal Study 2001 – 2011 Completeness of census linkage Series LS No. 11. http://www.ons.gov.uk/ons/guide-method/user-guidance/longitudinal-study/what-s-new/ls11-for-publication.pdf.

Østby, L. (2002) *The demographic characteristics of immigrant populations in Norway.* Reports 2002/22, Oslo, Statistics Norway.

Parrado, E.A. (2011) How High is Hispanic/Mexican Fertility in the United States? Immigration and Tempo Considerations. *Demography,* 48 (3), 1059-80.

Peach, C. (2006) South Asian migration and settlement in Great Britain, 1951–2001. *Contemporary South Asia*, 15 (2), 133–146.

Persson, L. and Hoem, J.M. (2014) Immigrant fertility in Sweden, 2000-2011: A descriptive note. *Demographic Research*, 30 (30), 887-898.

Robinson, D., Reeve, K., & Casey, R. (2007) *The housing pathways of new immigrants.* York: Joseph Rowntree Foundation.

Rogers, A. and Castro, L.J. (1981) *Model Migration Schedules.* International Institute for Applied System Analysis, Laxenburg, Austria.

Ryan, L. and Sales, R. (2013) Family migration: the role of children and education in family decision-making strategies of Polish migrants in London. *International Migration*, 51 (2), 90-103.

Sobotka, T. (2008) Overview Chapter 7: The rising importance of migrants for childbearing in Europe. *Demographic Research,* 19 (9), 225-248.

Sobotka, T. and Lutz, W. (2009) Misleading Policy Messages from the Period TFR: Should We Stop Using It? *European Demographic Research Papers 4*, Vienna: Vienna Institute of Demography of the Austrian Academy of Sciences.

Stephen, E. H. and Bean, F. D. (1992) Assimilation, Disruption and the Fertility of Mexican-Origin Women in the United States, *International Migration Review,* 26, 1, 67-88.

Toulemon, L. (2004) Fertility among immigrant women: new data, a new approach. *Population & Societies*, 400, 1-4.

Tromans, N., Natamba, E. and Jefferies, J. (2009) Have women born outside the UK driven the rise in UK births since 2001? *Population Trends,* 136, 28-42.

United Nations Development Programme (2011) *Human Development Report 2011, Sustainability and Equity: A Better Future for All.* United Nations, Palgrave Macmillan, Basingstoke, Hampshire. http://hdr.undp.org/sites/default/files/reports/271/hdr_2011_en_complete.pdf.

Vargas-Silva, C. (2014) *Migration Flows of A8 and other EU Migrants to and from the UK.* http://www.migrationobservatory.ox.ac.uk/sites/files/migobs/Migration%20Flows%20of%20A8%20and%20other%20EU%20Migrants%20to%20and%20from%20the%20UK_0.pdf.

Waller, L., Berrington, A. and 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.

White, A. (2009) "Family Migration from Small-town Poland: A Livelihood Strategy Approach." In Burrell, K. (ed.) *Polish Migration to the UK in the 'New' European Union After 2004.* Ashgate, Farnham, 67-86.

White, M. J., Moreno, L., and Guo, S. (1995) The interrelation of fertility and geographic mobility in Peru: a hazards model analysis, *International Migration Review,* 29(2):492–514.

White, A. (2011) *Polish Families and Migration Since EU Accession.* Policy Press, Bristol.

Zuccotti, C.V. (2013) *Highly-Skilled Indian Migrants in the United Kingdom.* CARIM-India Research Report 2013/34. http://www.india-eu-migration.eu/media/CARIM-India-HSM-2013-34.pdf

Zumpe, J., Dormon, O., and Jefferies, J. (2012) *Childbearing Among UK Born and Non-UK Born Women Living in the UK*. Office for National Statistics, 25 October, 2012. http://www.ons.gov.uk/ons/dcp171766_283876.pdf.

ISSN 2042-4116

ESRC Centre for Population Change
Building 58, Room 2001
Faculty of Social and Human Sciences
University of Southampton
SO17 1BJ

T: +44 (0)2380 592579
E: cpc@soton.ac.uk
www.cpc.ac.uk

To subscribe to the CPC newsletter and keep up-to-date with research activity, news and events, please register online: www.cpc.ac.uk/newsletter

For our latest research updates you can also follow CPC on Twitter, Facebook and Mendeley:

www.facebook.com/CPCpopulation

www.twitter.com/CPCpopulation

www.mendeley.com/groups/3241781/centre-for-population-change

The ESRC Centre for Population Change (CPC) is a joint initiative between the University of Southampton and a consortium of Scottish universities including St Andrews, Edinburgh, Stirling and Strathclyde, in partnership with the Office for National Statistics and National Records of Scotland.