University of Reading

Maternal Wellbeing Infant Feeding and Return to Paid Work

Technical Report 1: UKHLS

Professor Sarah Jewell, Dr Fari Aftab, Professor Marina Della Giusta, Professor Grace James, Professor Sylvia Jaworska and Dr Sam Rawlings

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Bluesky: @nuffieldfoundation.org
LinkedIn: Nuffield Foundation
Website: nuffieldfoundation.org

1. Overview of the UK Household Longitudinal Study

The UK Household Longitudinal Study (UKHLS, more commonly known as the Understanding Society) is a nationally representative household and individual level panel survey. The survey began in 2009 and follows approximately 40,000 households from across England, Scotland, Wales, and Northern Ireland over time. Households are interviewed annually but each wave (round of the survey) takes two years to complete. The dataset has a large general population sample, an ethnic minority booster sample, and an additional immigrant-ethnic minority boost sample (included from wave six), containing rich information on respondents' characteristics and behaviour. We utilise data that covers waves 3-13.

The UKHLS collects information on social and economic variables at the individual and household level. Importantly for us the survey collects information on new births including birth characteristics and breastfeeding behaviour, and information on economic activity and job characteristics, alongside demographics. It also collects information on wellbeing (life satisfaction and mental wellbeing). We use the UKHLS for two purposes. Firstly, we use the dataset to benchmark our primary data, as it provides information on general breastfeeding and work behaviour in the UK so we can understand breastfeeding initiation and duration rates, and the characteristics of those who are more likely to breastfeed and return to work. Secondly, since the dataset provides information on breastfeeding and work behaviour we model the relationship between breastfeeding and work, as well as their association with wellbeing.

We specifically use the following special licence version of the UKHLS as it includes the month of birth (the end licence user only includes information on year of birth) which enables us to identify the age of the child (in months) upon return to work:

University of Essex, Institute for Social and Economic Research. (2023). *Understanding Society: Waves 1-13, 2009-2022 and Harmonised BHPS: Waves 1-18, 1991-2009: Special Licence Access*. [data collection]. *17th Edition.* UK Data Service. SN: 6931, DOI: http://doi.org/10.5255/UKDA-SN-6931-16

1.1 Sample Creation

We draw together information from different data files in the UKHLS: the individual response file *(indresp*), stable characteristics file (*xwavedat*), newborn file (*newborn*) and child file (*child*). Except for the stable characteristics file, there is a version of each file for each wave (the newborn files start from wave 2). Successful pregnancies reported in a wave were identified from the individual response file and matched to information in the newborn file using the mother's unique identifier which was then matched to information in the child file (based on the child's unique identifier). The individual file contains information about the pregnancy (including mode of delivery

and whether a multiple birth), mother's personal characteristics, and information on employment, employment changes and maternity leave spells. The stable characteristics file contains fixed (over time) information, collected in the respondent's first interview and includes information on: ethnicity, respondent's parent's occupation when the respondent was aged 14, and month/year of the respondent's birth. The newborn file contains birth characteristics (birth weight, whether born early/late), and information on breastfeeding.

Breastfeeding Information

We combined information from the newborn file and the child file to obtain information on breastfeeding initiation and duration. In the newborn file information includes whether the child was breastfed and for how long. Respondents could answer breastfeeding duration in days, weeks, months or years – we converted all information to months breastfed (and rounded down when this led to partial months).

If an individual had not finished breastfeeding when information on breastfeeding was first collected (in the newborn file), information was collected on whether still breastfeeding (and if stopped the duration) in the next wave which is contained in the child file. We matched this information where available to obtain the duration for this group. However, respondents were not then followed up again if they breastfed beyond the point of the second wave of being asked information on breastfeeding. Therefore, for some, particularly those with long breastfeeding duration, we do not observe their full breastfeeding duration but know how long they had been breastfeeding at the point this information was last collected. For those with right censored breastfeeding duration information, we included these in the sample who had breastfed at least 12 months (344 occurrences), as we did not want to introduce bias by excluding mothers who breastfed for longer durations (and hence if they had returned by that point would be observed as breastfeeding upon return to work). This is generally not a problem as we are not interested in the full duration more whether they breastfed for at least 12 months and whether they were observed as breastfeeding around the time they returned to work. We excluded anyone who had been breastfeeding less than 12 months when the information was collected for a second time (24 observations).

Information in the newborn file was collected from wave 2 but the data from wave 2 was dropped due to an error in wave 3 by the data collectors relating to follow up of breastfeeding mothers who had still been breastfeeding in wave 2. We opted to drop the whole of wave 2 rather than just those with the error to avoid biasing the sample by only dropping those with longer breastfeeding durations.

Employment Information

We constructed a monthly employment and maternity leave history (with a row for each month and year combination, from the first year the respondent was observed in the data until the last point observed) for each mother based on the information collected in the individual files (*indresp*). We combined information on current

employment status/job information, employment status/job changes, maternity leave spells and expected return to work after birth. This information enabled us to work out the mother's employment status at the month of a birth and at what point they returned to work/started a job (if not previously employed at the time of the birth), if at all, after birth. For those mothers returning to work/starting a job we worked out how old the child was in months at the point of return to work/starting a job. The individual file also contains information on job characteristics, such as sector (public vs private), occupation, industry, organisation sizes, contract type and job hours (we collected this information at the time of birth and upon return to work).

Based on the status and return to work information we created a variable based on the mother's employment status at the time of birth (whether employed/on maternity leave or not employed/on maternity leave) and whether returned to work/started a job within 15 months of giving birth. We restricted our 'return to work' variable to return within 15 months of the child's birth to reflect that the maximum maternity leave is 12 months in the UK and that some mothers may add a few months of annual leave. We constructed the following categories: remained not employed (the mother was not employed before birth and did not start a job after giving birth), started a job (the mother was not observed as employed before birth but started a job after giving birth), returned to work (the mother was employed before birth and returned to work), not returned to work (the mother was employed before birth but did not return to work).

We are interested in observing any patterns in stopping breastfeeding around the time of return to work. To do this, we subtracted the age of child when the mother returned to work from the age of child when the mother stopped breastfeeding. In the resultant variable the negative months indicated the number of months they stopped breastfeeding before returning to work and positive months indicated the number of months for which they continued breastfeeding after returning to work. Respondents with positive values were defined as continuing to breastfeed upon return to work.

Control Variables

Personal information was obtained from the individual response files and the stable characteristics file. The age of the mother at the time of the birth was constructed on the basis of month and year of the mother's birth and the child's birth (obtained from the special licence version of the *xwavedat* file[1]) i.e. the child's birth date (in months) minus the mother's birth date (in months) converted to years (age). We also obtained the mother's ethnicity from the *xwavedat* file using the *racel_dv* variable which combines all the information collected on ethnicity for an individual. This variable uses

[1] University of Essex, Institute for Social and Economic Research. (2023). *Understanding Society: Waves 1-13, 2009-2022 and Harmonised BHPS: Waves 1-18, 1991-2009: Special Licence Access*. [data collection]. *17th Edition.* UK Data Service. SN: 6931, DOI: http://doi.org/10.5255/UKDA-SN-6931-16

17 categories, and we collapsed these to common ethnic groups: White, Asian/Asian British, Black/Black British and Mixed/other, owing to some groups having low frequencies. Anyone with missing ethnicity data was classed as having missing information. The *xwavedat* file contained information on the employment status and occupation of the respondent's mother and father (where present) when the respondent was aged 14. Based on this information we constructed an indicator of whether the respondent came from a higher socio-economic background based on whether their mother and/or father were employed in a professional or managerial occupation or not. This information was not available for all respondents.

From the *indresp* file we constructed pre-birth characteristics of the mother. We constructed an indicator of whether the mother had a university degree using the first category of the *hiqual_dv* variable, with all other qualifications classed as below degree level (including the 'other higher' degree category which is classed as below undergraduate level). Anyone who did not have information on a degree was classed as having missing information. We utilised gross monthly household income (*fihhmngrs_dv*) available from the household response file (*hhresp*) and equivalised this by dividing by the provided OECD-modified equivalence scale (*ieqmoecd_dv*)[2] which adjusts for household size. We also created an indicator of whether the individual was above or below the median equivalised household income in the sample, to capture higher vs lower income. Marital status was constructed from the *mastat_dv* variable and categories were grouped into: 'married/in a civil partnership, cohabiting' and 'not living with a partner/spouse'. We grouped region of residence (*gor_dv*) into(to be consistent with categories in other datasets in the study): North (North West, North East, Yorkshire and Humber), Midlands (West Midlands, East Midlands), East of England, London, South (South East and South West), Wales, Scotland and Northern Ireland. We also grouped the year of birth into 3 groups: 2010-2014, 2015-2019 and 2020+, to take into account that breastfeeding rates have changed over time and the pandemic may have impacted both breastfeeding continuation rates and the ability to combine breastfeeding and return to work (due to an increase in home working).

We constructed several variables capturing birth characteristics. Since low birth weight and whether born early/late are likely related, we created an indicator of whether the child was premature (born before 37 weeks) and/or had low birth weight (below 2.5kg). We also created an indicator of whether the birth was a caesarean (vs a vaginal delivery), and whether the mother was a first-time mother.

Job Attributes

The UKHLS contains several variables capturing job attributes, and we constructed the following variables, captured both before leave and upon return to work:

[2] For more details on this scale see the UKHLS documentation: https://www.understandingsociety.ac.uk/documentation/mainstage/variables/ieqmoecd_dv/

Occupation

3-digit standard occupation classification (SOC) codes were provided in the UKHLS and created based on the 2010 SOC classification as this was provided in most waves. In some cases where only 2000 or 2020 SOC classification codes were provided we matched these to the closest 2010 codes. We generally collapsed to the 2-digit SOC level so any minor discrepancies between the codes (due to reclassifications of occupations) made little difference. We occasionally use the 3-digit code to help with classification when identifying specific occupations such as health. We then created the following groups, as outlined in Table 1.1.

Table 1.1: Occupation Grouping

Short name	Full Name	Codes
Health	Health occupations	22 "Health professionals" 321 “Health associate professionals”
Teaching	Teaching and Educational occupations	23 "Teaching and educational professionals"
Managers and Other professionals	Managers and Directors, and Other professional occupations	11 "Corporate managers and directors" 12 "Other managers and proprietors 21 "Science, research, engineering and technology professionals" 24 “"Business, media and public service professionals"
Other associate professional	Other associate professional occupations	31 "Science, engineering and technology associate professionals" 32 "Health and social care associate professionals" 33 "Protective service occupations" 34 "Culture, media and sports occupations" 35 "Business and public service associate professionals" Excludes “321 Health associate professionals”
Administration	Administrative and secretarial occupations	41 "Administrative occupations" 42 "Secretarial and related occupations"

Services	Caring, leisure and sales occupations	61 "Caring personal service occupations" 62 "Leisure, travel and related personal service occupations" 71 "Sales occupations" 72 "Customer service occupations"
Other	Other occupations	51 "Skilled agricultural and related trades" 52 "Skilled metal, electrical and electronic trades" 53 "Skilled construction and building trades" 54 "Textiles, printing and other skilled trades" 81 "Process, plant and machine operatives" 82 "Transport and mobile machine drivers and operatives" 91 "Elementary trades and related occupations" 92 "Elementary administration and service occupations"

Public vs Private Sector

Respondents were asked if they worked for a private firm or business (*jbsect*), if they did not work for a private firm they were then asked the type of organisation non-private organisation (*jbsectpub*) and we split this into the public sector and other (includes charities and the non-profit/voluntary sector). Where industry information was available, we used this to updated missing values for sector of organisation.

Industry

The UKHLS provided 3-digit standard industrial classification (SIC) codes using the 2007 classification, these were used to construct industry sectors (from industry section level) that were aligned with definitions used in our Maternal Experiences survey and employer (HR Decision Maker and Line Manager surveys), which we have outlined in Table 1.2. We followed industry 'sectors' used in the Labour Force Survey but due to small cell size we combined the Agriculture, forestry and fishing (A) with Energy and Water (B, D, E), Manufacturing (C) and Construction (F) sectors, and combined Distribution, hotels and restaurants (G, I) with Other services (R, S, T, U), We split out Public Administration, Education, and Health and Social Work(O,P,Q), due

to these being common sectors among our survey of mothers. We further combined some categories into an 'other' group when cell sizes were too small.

Table 1.2: Industry Sector Grouping

Short Name	Full Name	Industry Sections
Primary and secondary industries	Manufacturing, construction, primary and energy	A: Agriculture, forestry and fishing B: Mining and quarrying C: Manufacturing D: Electricity, gas, steam and air conditioning supply E: Water supply; sewerage, waste management and remediation activities F: Construction
Transport and communication	Transport, information and communication	H: Transportation and storage J: Information and communication
Business and Professional Service	Finance, business and professional services	K: Financial and insurance activities L: Real estate activities M: Professional, scientific and technical activities N: Administrative and support service activities
Other services	Retail, accommodation and food; other services	G: Wholesale and retail trade; repair of motor vehicles and motorcycles I: Accommodation and food service activities R: Arts, entertainment and recreation S: Other service activities T: Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use U: Activities of extraterritorial organisations and bodies
Public Administration	Public Administration and Defence	O: Public administration and defence, compulsory social security

Education	Education	P: Education
Health and Social Work	Health and Social Work Activities	Q: Human health and social work activities

Other Job Attributes

Other job attributes include firm/organisation size (*jbsize*), commuting time (*jsttwt*) and whether flexible working is offered by their employer (*jbflex*). We created an indicator of large organisations defined as 200+ employees[3]. We also identified from the *jbflex* variables if the employer 'offered regular working from home' as an option, this was asked in alternate (even) waves.

The UKHLS asked employees in even waves (from wave 2) 'I would like to ask about working arrangements at the place where you work. If you personally needed any, which of the following arrangements are available at your workplace? '

1. Part time working
2. Working term time only
3. Job sharing
4. Flexi-time
5. Working compressed hours
6. To work annualised hours
7. To work from home on a regular basis
8. Other flexible working arrangements
9. Zero-hours contract
10. On-call working None of these

The UKHLS also asked respondents which working arrangements they use but we focus on the availability rather than their use to reduce potential endogeneity between use and infant feeding decisions, and secondly this provides a general measure of flexibility at the workplace that may indicate whether unobservable aspects that may facilitate breastfeeding such as breaks for breastfeeding/expressing breastmilk may be more or less likely.

We classed job sharing, flexi-time, compressed/annualised hours, working from home and other as a flexible working arrangement. We excluded part time working (as this may not indicate whether an individual can reduce their hours, rather just whether part time jobs are available), term time only (as this is specific to certain jobs), zero-hours and on-call working (which may be more of a constraint).

[3] Unfortunately, the categories provided by the UKHLS did not allow us to split by 250+ employees, a common threshold for identifying large firms in the UK (particularly for government workplace policies such as mandatory gender pay gap reporting). We hence used 200 which was the closest available threshold available in the data.

1.2 Final Samples

Full Sample

6,163 births were identified in the data but 891 births observations were dropped from wave 2 due to the data collector error mention above. We dropped the 84 who had a multiple birth, owing to the different issues relating to multiple births (e.g. twins, triples). In order to be in our final sample we need information in the wave prior to the birth (to capture pre-birth characteristics), and to have full information on breastfeeding (as described above) and return to work status. This leads to a final sample of 3,568 births from 2,820 mothers.

Table 1.3 provides the distribution of employment status (within 15 months of giving birth), split by groups of interest used in our modelling. 2,419 of our sample were classed as employed prior to giving birth (68.4%). Among those who were employed the majority (85.5%) returned to work within 15 months of giving birth. A small minority (8.4% of the sample) among those who were not previous employed started a job within 15 months of giving birth. 2,162 (61.13%) of our sample were observed as employed within 15 months of giving birth.

Table 1:3: Post Partum Employment Status (N in brackets)

	Not breastfed 3+ months (%)	Breastfed 3+ months (%)	All (%)
Remained not employed	34.0 (670)	22.6 (361)	28.9 (1,031)
Not employed: start a job	2.8 (55)	2.5 (40)	2.7 (95)
Employed, returned	53.1 (1,045)	65.0 (1,040)	58.4 (2,085)
Employed, did not return	10.1 (199)	9.9 (158)	10.0 (357)
Total	100.0 (1,969)	100.0 (1,599)	100.0 (3,568)

Source: UKHLS, wave 3-13. Own estimates

Characteristics of the Full Sample

Table 1.4 provides the characteristics of the full sample, split by groups of interest used in our modelling

We are typically interested in the group who returned/started work within 15 months of giving birth. Among those who are working within 15 months of giving birth the average age of the child upon return to work is 9.3 months, and we can see from Figure 1.1 that 9 months (21.1%) followed by 12 months (18.3%) are the most common points to return to work.

Table 1.4: Characteristics of Full Sample by Breastfeeding and Work Behaviour

	All	Breastfed at least 3 months		Employed 15 months postpartum		Employed and breastfed at least 3 months	Continued BF Upon RTW
		No	Yes	No	Yes		
Degree	39.6	26.4	55.8	21.8	50.9	66.4	70.3
Age Group							
Aged 16-24	14.7	20.8	7.1	24.0	8.7	4.4	3.9
Aged 25-34	59.9	57.8	62.5	54.8	63.2	62.2	62.0
Aged 35+	25.4	21.4	30.4	21.3	28.1	33.3	34.1
Live with spouse / partner	82.3	76.1	89.9	72.3	88.6	94.2	94.4
Ethnic group							
White	80.9	87.0	73.4	70.9	87.3	83.1	80.7
Asian	12.2	9.4	15.8	19.7	7.5	8.9	10.0
Black	3.9	1.6	6.8	5.2	3.1	4.6	5.9
Mixed/other	2.9	1.9	4.1	4.2	2.1	3.3	3.5
Equivalised monthly household income*	2223.9	1932.7	2582.2	1516.365	2673.907	2983.2	3004.9
Region of Residence							
North	22.7	25.9	18.8	22.9	22.6	19.5	20.0
Midlands	16.6	16.8	16.4	17.8	15.9	16.2	17.4
East	8.5	8.3	8.9	9.0	8.3	8.9	9.3
London	11.9	6.9	18.2	15.2	9.9	13.9	13.7
South	18.7	16.6	21.4	17.0	19.8	23.4	24.5
Wales	7.0	7.9	5.8	6.5	7.2	5.9	6.1
Scotland	7.1	7.7	6.4	5.8	7.9	7.0	5.2
Northern Ireland	7.4	10.1	4.1	5.8	8.4	5.1	3.9
High social-economic background*	19.2	12.5	26.6	17.8	19.9	26.2	30.7
Birth Characteristics							

Premature birth/low birth weight	8.5	9.6	7.0	10.4	7.2	5.5	
Caesarean	26.1	27.2	24.8	25.0	26.8	25.4	
First time mum	36.7	36.1	37.5	25.4	43.9	44.2	44.3
Breastfeeding behaviour							
Breastfed 3+ months	44.8		100.0	100.0	100.0	100.0	100.0
Breastfed 6+months	34.1		76.1	28.2	37.9	76.5	98.9
Breastfed 9+ months	24.2		53.9	21.0	26.2	52.8	95.0
Breastfed 12+ months	18.8		42.0	17.7	19.5	39.4	82.4
Time period							
Before 2015	55.4	57.8	52.3	61.0	51.8	49.4	39.3
2015-2019	39.3	37.9	41.1	35.7	41.7	42.7	48.8
2020+	5.3	4.2	6.6	3.2	6.6	7.9	11.9
N births	3568	1969	1599	1388	2180	1080	461
N Mothers	2838	1639	1322	1152	1794	899	391

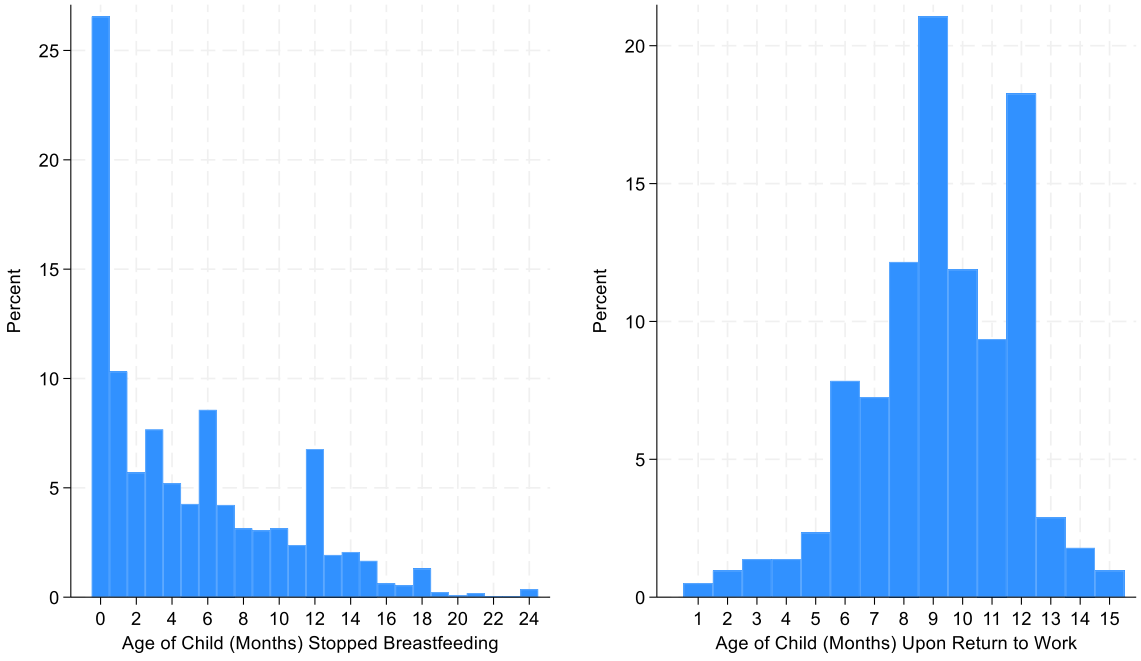
*Socio-economic background (not available for 722 births from 571 mothers) and income (not available for 31 births from 29 mothers) was not available for all

Source: UKHLS, waves 3-13. Own estimates

Continued BF upon RTW refers to those who were breastfeeding upon return to paid work

71.4% of our full sample initiated breastfeeding. The most common point to stop is within the first month (see Figure 1.1). We are typically interested in those who have breastfed at least 3 months as we argue by this point women have established breastfeeding, this is to avoid conflating factors that impact initiation and continuing to breastfeed. 44.8% of our sample breastfed for at least 3 months.

Figure 1.1: Months Stopped Breastfeeding and Months Returned to work



Notes: Source: UKHLS, own estimates. The figure showing the distribution of months stopped breastfeeding includes births where the mother had finished breastfeeding and by 24 months which includes 2,230 births from 1,858 mothers. The figure showing distribution of return to work include the sample who returned to work within 15 months of giving birth and includes 2,180 births from 1,794 mothers

Breastfeeding and Return to Work Behaviour by Sub Group

Table 1.5 and Table 1.6 report breastfeeding and employment behaviour by sub-group.

Table 1.5: Breastfeeding and Employment Behaviour, by Sub Groups

		Degree		Ethnicity				Age Group		
	All	No	Yes	White	Asian	Black	Mixed /Other	16-24	25-34	35+
Breastfeeding behaviour										
Breastfed 3+ months	44.8	32.7	63.2	40.6	57.7	77.1	63.5	21.8	46.7	53.6
Breastfed 6+months	34.1	23.5	50.3	30.6	46.7	56.4	48.1	15.9	35.5	41.5
Breastfed 9+ months	24.2	15.7	37.0	21.5	34.6	37.9	36.5	10.1	25.0	30.2
Breastfed 12+ months	18.8	12.7	28.2	16.1	29.5	32.1	29.8	8.8	19.0	24.0
Employment										
Employed 15 months post partum	61.1	49.6	78.6	65.9	37.3	48.6	44.2	36.3	64.5	67.5
Age of Child (Months)on Return	9.3	8.9	9.6	9.3	9.5	8.8	9.4	8.3	9.3	9.5
Breastfeeding Upon RTW	21.1	12.8	29.2	19.5	28.2	39.7	34.8	9.5	20.8	25.7
N	3,568	2,156	1,412	2,887	437	140	104	523	2,138	907
N employed	2,180	1,070	1,110	1,903	163	68	46	190	1,378	612

Table 1.6: Breastfeeding and Employment Behaviour, by Socio-Economic Factors

	High Socio-Economic Background		Above Median Equivalised Income		Professional/Managerial Job	
	No	Yes	No	Yes	No	Yes
Breastfeeding behaviour						
Breastfed 3+ months	43.2	65.9	35.5	54.2	43.0	59.8
Breastfed 6+months	31.6	55.3	26.1	42.0	31.9	47.9
Breastfed 9+ months	21.3	41.9	18.4	29.8	21.7	35.1
Breastfed 12+ months	16.3	32.4	14.9	22.6	16.0	27.7
Employment						
Employed 15 months post-partum	65.2	68.1	40.6	81.6	83.0	90.2
Age of Child (Months)on Return	9.3	9.4	8.8	9.5	9.2	9.4
Breastfeeding Upon RTW	18.2	32.5	17.7	22.9	17.1	28.6
N	2,300	546	1,768	1,769	1,538	1,277
N employed	1,499	472	718	1,444	864	2,056

Table 1.7 provides the distribution across different job characteristics for the full sample employed prior to giving birth (based on their reported status in the month prior to giving birth) and the sub-sample who established breastfeeding (3+ Months)

Table 1.7: Characteristics of Sample Employed Prior to Birth: Job Characteristics

	All	Breastfed 3+ Months
Industry		
Education	16.8	19.7
Health and Social Work	29.8	29.9
Public administration	7.0	7.0
Business and Professional Services	15.0	15.3
Other services	20.0	15.3
Other	11.5	12.8
N	*2,376*	*1,167*
Occupation (%)		
Health	11.2	14.5
Teaching	12.7	15.8
Managers and Other professionals	16.2	18.3
Other associate professionals	15.3	18.2
Administration	13.5	12.4
Services	24.4	15.9
Other	6.7	4.9

N	*2,402*	*1,179*
Availability of Flexible working (%)		
Any	59.0	62.8
Working from home	14.8	18.6
N	*1,243*	*540*
Commuting Time		
Mean	27.0	29.2
Median	20	25
75th percentile	35	40
N	*2,197*	*1,049*

Appendix 1: Regression Analysis of Return to Work Behaviour and Breastfeeding Behaviour

Using the full UKHLS sample outlined in Section 1.2 we explored the key factors associated (the variables of interest are explained in Section 1.1) with return to work and breastfeeding behaviour. Table A1.1 explores how return to work varies across different sub-groups, investigating whether the respondent was employed 15 months after birth and among those who returned to work the age of the child upon return to work and whether they returned when the child was 12+ months. 12 months is the point children can be introduced to cow's milk or alternative to cow's milk. Before 12 months breastmilk or infant formula milk is recommended as the main drink by the NHS and is a major contributor to the child's nutritional needs.

The more highly educated and older individuals were more likely to be employed 15 months after giving birth, and more likely to return when their child older (and return when their child is 12+ months). Those from the Asian group were less likely to be employed 15 months after birth but when they were employed they were the group most likely to return when their child is 12+ months.

Table A1.1: Return to Work Behaviour Regressions

	Employed within 15 months postpartum	Return to work within 15 months	Months Returned	Returned 12+ months
Have a degree	0.184***	0.056***	0.445***	0.073***
	[0.018]	[0.015]	[0.119]	[0.020]
Age group (ref: 16-24)				
25-34	0.209***	0.076**	0.711***	0.035
	[0.026]	[0.034]	[0.222]	[0.031]
35+	0.250***	0.093***	0.798***	0.092**
	[0.030]	[0.036]	[0.250]	[0.036]
Live with spouse/partner	0.162***	0.067**	0.306	0.037
	[0.023]	[0.028]	[0.198]	[0.028]
Ethnicity (ref: white)				
Asian	-0.268***	-0.103***	0.045	0.111**
	[0.028]	[0.034]	[0.249]	[0.044]
Black	-0.055	-0.037	-0.585	-0.024
	[0.047]	[0.049]	[0.435]	[0.056]
Mixed/other	-0.178***	-0.078	-0.054	-0.002
	[0.048]	[0.058]	[0.411]	[0.069]
First time Mum	0.189***	0.015	0.222**	0.026

	[0.015]	[0.015]	[0.106]	[0.018]
Region of residence (ref: North)				
Midlands	0.010	0.009	-0.003	-0.027
	[0.027]	[0.024]	[0.181]	[0.029]
East	-0.054	-0.047	0.183	0.060
	[0.035]	[0.032]	[0.225]	[0.040]
London	-0.040	-0.028	0.511**	0.108***
	[0.032]	[0.032]	[0.239]	[0.042]
South	-0.001	-0.008	0.214	0.049*
	[0.026]	[0.022]	[0.171]	[0.029]
Wales	0.015	0.019	0.370	0.039
	[0.034]	[0.028]	[0.230]	[0.041]
Scotland	0.004	0.008	-0.246	-0.004
	[0.036]	[0.029]	[0.260]	[0.036]
Northern Ireland	0.061**	-0.010	-0.291	-0.038
	[0.031]	[0.028]	[0.215]	[0.035]
Time period: 2009-2014				
2015-2019	0.043***	0.002	0.527***	0.087***
	[0.016]	[0.015]	[0.111]	[0.019]
2020 onwards	0.133***	0.037	0.738***	0.132***
	[0.031]	[0.027]	[0.219]	[0.041]
Observations	3,568	2,442	2,180	2,180
R-squared	0.199	0.031	0.049	0.052

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Includes the sample who have information on return to work and breastfeeding behaviour, see Section 1.2 for more information on the sample creation and Section 1.1 for more information on the variables. Includes 3,568 births from 2,838 mothers. The second column includes only those who were employed prior to giving birth. The third and forth columns includes births where the mother was employed 15 months after giving birth. All estimations obtained through ordinary least squares regression.

Not all individuals in our sample had information on socio-economic background (based on parents employment and occupation when the individual was aged 14) and income so these were added to the regressions reported in Table A1.1 in Table A1.2. There was no difference in return to work behaviour by socio-economic background but those with higher income were more likely to be employed, return to work and return when their child was older (although not specifically as 12+ months).

Table A1.2: Return to Work Behaviour Regressions, Additional Controls

	Employed within 15 months postpartum	Return to work within 15 months	Months Returned	Returned 12+ months
Panel A: High socio-economic background	-0.008	-0.021	0.033	0.003
	[0.024]	[0.021]	[0.161]	[0.028]
Observations	2,846	2,078	1,871	1,871
R-squared	0.171	0.029	0.039	0.042
Panel B: Above median equivalised income	0.259***	0.055***	0.322**	0.031
	[0.019]	[0.018]	[0.134]	[0.021]
Observations	3,537	2,419	2,162	2,162
R-squared	0.247	0.035	0.051	0.054

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
See notes to Table A1.1

Table A1.3 reports the estimations of breastfeeding behaviour. We model the likelihood of breastfeeding at least 3 months, and then conditional on breastfeeding for at least 3 months, breastfeeding for at least 6, 9 and 12 months. This enables us to distinguish between factors that impact establishing breastfeeding with those that impact continuation.

As is consistent with past literature the highly educated, older, those from minority ethnic groups, higher socio-economic backgrounds and with higher income (shown in Table A1.4), are more likely to establish breastfeeding (be breastfeeding at 3 months). Those who had birth complications (premature, low birth weight or a caesarean) were also less likely to establish breastfeeding.

Among ethnic groups it is particularly the Black ethnic group who are more likely to establish breastfeeding. When we examine continuation rates for the sample who established breastfeeding, personal characteristics play less of a role in continuation rates. Only being highly educated and from the Asian ethnic group impacts the likelihood of continuing.

Table A1.3: Breastfeeding Behaviour Regressions

		Conditional on BF 3+ months		
	BF 3+ months	BF 6 + months	BF 9+ months	BF 12+ months
Have a degree	0.243***	0.072***	0.100***	0.063**
	[0.019]	[0.024]	[0.028]	[0.027]
Age group (ref: 16-24)				
25-34	0.107***	-0.030	0.009	-0.030
	[0.023]	[0.048]	[0.054]	[0.054]
35+	0.129***	-0.026	0.019	-0.004
	[0.029]	[0.052]	[0.058]	[0.058]
Live with spouse/partner	0.134***	0.078*	0.048	0.008
	[0.020]	[0.043]	[0.047]	[0.046]
Ethnicity (ref: white)				
Asian	0.114***	0.063**	0.078**	0.123***
	[0.029]	[0.032]	[0.040]	[0.039]
Black	0.335***	0.042	0.034	0.079
	[0.047]	[0.055]	[0.061]	[0.060]
Mixed/other	0.163***	0.025	0.069	0.096
	[0.049]	[0.062]	[0.068]	[0.066]
First time Mum	0.033**	0.007	-0.007	-0.008
	[0.016]	[0.022]	[0.025]	[0.025]
Region of residence (ref: North)				
Midlands	0.071**	-0.040	0.043	0.035
	[0.028]	[0.037]	[0.045]	[0.043]
East	0.073**	-0.050	-0.022	0.027
	[0.036]	[0.046]	[0.054]	[0.053]
London	0.195***	-0.047	-0.027	-0.011
	[0.032]	[0.037]	[0.046]	[0.045]
South	0.127***	-0.009	0.005	0.041
	[0.026]	[0.033]	[0.042]	[0.041]
Wales	0.027	-0.081	-0.014	0.018
	[0.037]	[0.058]	[0.065]	[0.062]
Scotland	0.035	-0.081	-0.066	-0.073
	[0.036]	[0.054]	[0.062]	[0.062]
Northern Ireland	-0.092***	-0.075	-0.121*	-0.053
	[0.034]	[0.064]	[0.071]	[0.065]
Time period (ref: 2009-2014)				
2015-2019	0.024	0.079***	0.158***	0.196***
	[0.016]	[0.023]	[0.026]	[0.026]
2020 onwards	0.098***	0.132***	0.275***	0.346***
	[0.035]	[0.037]	[0.047]	[0.050]
Observations	3,568	1,599	1,599	1,599

R-squared	0.171	0.030	0.056	0.072

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
BF refers to breastfeeding and the regressions include breastfeeding for at least the reported number of months

Table A1.4: Established Breastfeeding, Additional Controls

	BF 3+ months	BF 3+ months	BF 3+ months
Premature birth/low birth weight	-0.072***	-0.055*	-0.074***
	[0.027]	[0.032]	[0.028]
Caesarean	-0.061***	-0.067***	-0.061***
	[0.018]	[0.021]	[0.018]
High socio-economic background		0.126***	
		[0.025]	
Above median equivalised income			0.063***
			[0.020]
Observations	3,568	2,846	3,537
R-squared	0.176	0.170	0.177

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

We then modelled the probability of continuing to breastfeed upon return to work. We modelled this for all and then conditional on establishing breastfeeding. We then explored whether this varied by occupation and industry groups. Table A1.5 reports the results for personal characteristics. When conditioning on establishing breastfeeding only being highly educated, being from a high socio-economic background (not shown) and from the Black ethnic group impacted the likelihood of continuing to breastfeed. The effect of education lessens a little bit when controlling for occupation. It is also worth noting that the older the child upon return to work the lower the probability of continuing to breastfeed, that partly reflects a general trend that the older the child, the less likely they are to be breastfeeding.

Table A1.6 reports the impact of industry and occupation. The first two columns also explores if there are differences in establishing breastfeeding rates by industry and occupation (with and without controls – to reflect there are differences in average characteristics of workers by industry and occupation). Although the effect reduces when controlling of personal characteristics, those in the Other Services industry, and those working in non-managerial and professional occupations were less likely to establish breastfeeding. Rates of breastfeeding upon return to work, conditioning on establishing breastfeeding, were highest in the Health and Social Work, followed by Education and Other Services industries. When exploring by occupation only those in teaching were statistically significantly more likely to continue breastfeeding when conditioning on having established breastfeeding.

Table A1.5: Factors Impacting Breastfeeding Upon Return to Work

			with Industry		with occupation	
	Continued BF Upon RTW	Continued BF on RTW, BF 3+ Months	Continued BF Upon RTW	Continued BF on RTW, BF 3+ Months	Continued BF Upon RTW	Continued BF on RTW, BF 3+ Months
Have a degree	0.139***	0.081**	0.137***	0.081**	0.116***	0.074*
	[0.020]	[0.034]	[0.021]	[0.036]	[0.022]	[0.038]
Age group (ref: 16-24)						
25-34	0.035	0.061	0.029	0.013	0.013	0.012
	[0.026]	[0.083]	[0.030]	[0.093]	[0.031]	[0.093]
35+	0.060*	0.068	0.061*	0.034	0.031	0.017
	[0.032]	[0.086]	[0.036]	[0.097]	[0.036]	[0.097]
Live with spouse/partner	0.077***	0.049	0.077***	0.054	0.075***	0.070
	[0.023]	[0.071]	[0.025]	[0.071]	[0.025]	[0.074]
Ethnicity (ref: white)						
Asian	0.051	0.067	0.060	0.060	0.072	0.089
	[0.042]	[0.061]	[0.045]	[0.062]	[0.045]	[0.062]
Black	0.197***	0.166**	0.178**	0.164*	0.195**	0.170*
	[0.072]	[0.083]	[0.078]	[0.090]	[0.077]	[0.089]
Mixed/other	0.101	0.057	0.085	0.012	0.078	0.018
	[0.074]	[0.088]	[0.076]	[0.091]	[0.074]	[0.088]
First time Mum	0.011	0.016	0.010	0.023	0.009	0.021
	[0.016]	[0.029]	[0.017]	[0.030]	[0.017]	[0.031]
Region of residence (ref: North)						
Midlands	0.044	0.033	0.048	0.045	0.035	0.026
	[0.031]	[0.055]	[0.033]	[0.056]	[0.032]	[0.056]
East	0.042	0.010	0.048	0.008	0.047	0.008
	[0.040]	[0.065]	[0.042]	[0.066]	[0.042]	[0.066]
London	0.042	-0.048	0.050	-0.030	0.042	-0.049
	[0.041]	[0.061]	[0.043]	[0.062]	[0.043]	[0.062]
South	0.068**	0.011	0.078**	0.031	0.076**	0.018
	[0.030]	[0.050]	[0.031]	[0.051]	[0.031]	[0.051]
Wales	0.006	0.044	0.012	0.048	0.011	0.044
	[0.039]	[0.078]	[0.041]	[0.078]	[0.041]	[0.080]
Scotland	-0.038	-0.123*	-0.041	-0.133*	-0.038	-0.132*
	[0.034]	[0.069]	[0.035]	[0.073]	[0.036]	[0.073]
Northern Ireland	-0.079***	-0.087	-0.075**	-0.099	-0.078**	-0.095
	[0.030]	[0.074]	[0.032]	[0.075]	[0.031]	[0.074]
Time period: 2009-2014						
2015-2019	0.082***	0.174***	0.088***	0.189***	0.088***	0.187***
	[0.017]	[0.031]	[0.018]	[0.032]	[0.018]	[0.032]
2020 onwards	0.212***	0.331***	0.221***	0.343***	0.210***	0.339***
	[0.041]	[0.056]	[0.045]	[0.058]	[0.042]	[0.059]
Months returned	-0.004	-0.030***	-0.003	-0.030***	-0.003	-0.030***

	[0.004]	[0.006]	[0.004]	[0.007]	[0.004]	[0.007]
Observations	2,180	1,080	2,037	1,019	2,056	1,024
R-squared	0.088	0.076	0.092	0.090	0.091	0.085

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table A1.6: Impact of Job Attributes on Breastfeeding and Return to Work Behaviour

	Breastfed 3+ months		Continued BF Upon RTW		Continued BF Upon RTW, BF 3+ months	
	No controls	With Controls	No controls	With Controls	No controls	With Controls
Panel A - Industry (ref: other)						
Education	0.032	-0.013	0.085**	0.050	0.115**	0.101*
	[0.044]	[0.042]	[0.039]	[0.037]	[0.058]	[0.056]
Health and Social Work	-0.054	-0.009	0.061*	0.074**	0.144***	0.149***
	[0.039]	[0.037]	[0.034]	[0.033]	[0.053]	[0.052]
Public administration	-0.052	-0.056	0.012	0.014	0.074	0.084
	[0.054]	[0.051]	[0.042]	[0.041]	[0.072]	[0.070]
Business and professional services	-0.046	-0.048	0.017	0.015	0.055	0.050
	[0.044]	[0.042]	[0.038]	[0.036]	[0.062]	[0.060]
Other services	-0.168***	-0.066*	-0.012	0.035	0.111*	0.111*
	[0.041]	[0.039]	[0.034]	[0.034]	[0.062]	[0.062]
Observations	2,376	2,376	2,037	2,037	1,019	1,019
R-squared	0.017	0.143	0.009	0.092	0.018	0.090
Panel B - Occupation(ref: Associate professionals)						
Health	0.050	0.054	0.038	0.041	0.038	0.057
	[0.043]	[0.041]	[0.039]	[0.039]	[0.057]	[0.056]
Teaching	0.026	-0.010	0.086**	0.061	0.109*	0.103*
	[0.043]	[0.042]	[0.041]	[0.040]	[0.057]	[0.056]
Managers and Other professionals	-0.032	-0.043	0.037	0.033	0.081	0.084
	[0.039]	[0.037]	[0.035]	[0.034]	[0.053]	[0.051]
Administration	-0.137***	-0.069*	-0.040	0.004	0.017	0.049
	[0.041]	[0.040]	[0.033]	[0.033]	[0.056]	[0.057]
Services	-0.266***	-0.132***	-0.089***	-0.015	0.028	0.079
	[0.035]	[0.037]	[0.030]	[0.032]	[0.058]	[0.060]
Other	-0.228***	-0.100**	-0.104***	-0.027	-0.017	0.016
	[0.049]	[0.048]	[0.039]	[0.039]	[0.090]	[0.092]
Observations	2,402	2,402	2,056	2,056	1,024	1,024
R-squared	0.059	0.149	0.024	0.091	0.016	0.085

Controls are the same as in Table A1.5.