

## **Supplementary Materials**

### **Home Birth and Breast Feeding Outcomes: a Cross-Sectional Study in 28,125 Mother-Infant Pairs from Ireland and UK**

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**Appendix A:** Assessment of Breastfeeding in GUI & UKMCS

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## **Appendix A: Assessment of Breastfeeding in GUI & UKMCS**

### **1) GUI:**

Breastfeeding:

-How old was the infant when he/she stopped being breastfed?

Exclusive breastfeeding:

-How old was the infant when he/she stopped being exclusively breastfed?

### **2) UKMCS**

Breastfeeding:

-How old was the infant when he/she last had breast milk?

Exclusive breastfeeding:

-How old was the infant when he/she first had other (not breast milk) types of milk?

-How old was the infant when he/she first had cow's milk?

-How old was the infant when he/she first had any solid food?

## **Appendix B: Assessment of place of birth in GUI & UKMCS**

### **1) GUI**

**Question:** Where was the infant born?

**Response:**

- 1) Planned home birth
- 2) In hospital
- 3) Other

### **2) UKMCS**

**Question:** Where was the infant born?

**Response:**

- 1) In hospital
- 2) At home
- 3) Somewhere else

## Appendix C: Excluded participants

<b>Risk factor</b>	<b>GUI</b>	<b>UKMCS</b>
Foetal related problems	17	166
Incomplete questionnaire	NA	53
Placental disorder	25	NA
High risk labour	48	NA
High risk pregnancy	24	NA
Labour less than 31 weeks	11	109
Maternal conditions	66	261
Amniotic fluid problem- Oligohydramnios (UK), Polyhydramnios (GUI)	72	23
Slow growth	229	97
Twins, Triplets, more	NA	256
Birth place outside home or hospital	38	36
<b>Total</b>	<b>530</b>	<b>1001</b>

Exclusion criteria are based on the risk factors for home birth, as determined by HSE and NICE criteria outlined in Appendix C, in the mother or the infant, which were measured in GUI and/or in UKMCS, and were not present in those mothers who underwent home birth. In this table the number of excluded participants is shown. This table does not show how many times a condition of exclusion was encountered in the cohorts, but rather shows how many mother-infant pairs in total were excluded, as multiple risk factors were encountered in some mother-infant pairs. The pre-exclusion GUI cohort includes 11,134 mother-infant pairs, but after exclusion of pairs who met at least one of the criteria listed (n=530), 10,604 pairs remain; in UKMCS the total pre-exclusion cohort includes 18,522 pairs, but after exclusion (n=1,001), 17,521 pairs remain.

**Appendix D:**  
**Home birth versus hospital birth: analysis of GUI and UKMCS restricted to those who were breastfeeding at each preceding time-point.**

<b>Analysis</b>	<b>Breastfeeding time-point</b>	<b>Study population</b>	<b>OR</b>	<b>Confidence interval (95%)</b>	<b>p-value</b>	
<b>Unadjusted:</b>	<i>Initiation</i>	GUI	2.23	1.53-3.24	<0.0001	
		UKMCS	2.31	1.74-3.05	<0.001	
	<i>8 weeks</i>	GUI	1.78	1.07-2.94	0.02513	
		UKMCS	2.42	1.80-3.32	<0.001	
	<i>6 months</i>	GUI	1.55	1.04-2.30	0.03017	
		UKMCS	2.42	1.83-3.24	<0.001	
	<i>6 months: exclusive</i>	GUI	2.03	1.20-3.43	0.0082	
		UKMCS	1.56	0.828 -2.695	0.137	
	<b>Adjusted:</b>	<i>Initiation</i>	GUI	1.90	1.19-3.02	0.0073
			UKMCS	2.49	1.84-3.44	<0.001
<i>8 weeks</i>		GUI	1.40	0.81-2.42	0.2307	
		UKMCS	1.90	1.38-2.66	<0.001	
<i>6 months</i>		GUI	1.54	0.96-2.46	0.0726	
		UKMCS	2.17	1.61-2.97	<0.001	
<i>6 months: exclusive</i>		GUI	2.50	1.35-4.63	0.0037	
		UKMCS	1.41	0.71-2.58	0.29138	

In this supplementary analysis at each time-point the mother-infant pairs who did not breastfeed at the preceding time-point are dropped; ie the mothers who did not breastfeed at birth are not included in the analysis at 8 weeks, those who did not breastfeed at 8 weeks are not included in the analysis at 6 months, and the mothers who did not breastfeed at 6 months are not included in the analysis of exclusive breastfeeding at 6 months. After exclusion of non-breastfeeding mothers at each subsequent time point the association of breastfeeding and home birth in GUI in adjusted analysis was maintained at birth and at 6 months of exclusive breastfeeding but was lost at 8 weeks and at 6 months. In unadjusted analysis the association was lessened but still present at all time-points assessed. In UKMCS in adjusted analysis the association was maintained, though attenuated, at time-points including at birth, 8 weeks and 6 months, and association was lost for six months of exclusive breastfeeding. In the unadjusted analysis of UKMCS the association was maintained but attenuated at birth, 8 weeks, and at 6 months, and was lost for 6 months of exclusive breastfeeding.

**Home birth versus hospital birth: GUI and UKMCS analysis excluding births which involved interventions, including Caesarean delivery, forceps delivery and ventouse delivery.**

<b>Analysis</b>	<b>Breastfeeding time-point</b>	<b>Study population</b>	<b>OR</b>	<b>Confidence interval (95%)</b>	<b>p-value</b>
<b>Unadjusted</b>	<i>Initiation</i>	GUI	2.28	1.46-3.56	0.0003
		UKMCS	2.43	1.85-3.25	<0.0001
	<i>8 weeks</i>	GUI	2.30	1.55-3.41	<0.0001
		UKMCS	2.69	2.14-3.39	<0.0001
	<i>6 months</i>	GUI	2.64	1.82-3.84	<0.0001
		UKMCS	3.25	2.61-4.04	<0.0001
	<i>6 months: exclusive</i>	GUI	3.39	2.23-5.17	<0.0001
		UKMCS	2.91	1.56-4.97	<0.0001
<b>Adjusted</b>	<i>Initiation</i>	GUI	2.24	1.27 -3.96	0.00551
		UKMCS	2.53	1.87-3.48	<0.001
	<i>8 weeks</i>	GUI	2.07	1.25 -3.41	0.0046
		UKMCS	2.53	1.95-3.11	<0.001
	<i>6 months</i>	GUI	2.37	1.48- 3.79	0.0003
		UKMCS	2.91	2.25-3.75	<0.001
	<i>6 months: exclusive</i>	GUI	3.41	2.07- 5.62	<0.0001
		UKMCS	2.06	1.04-3.72	0.025

In this supplementary analysis of home versus hospital birth infants whose final mode of delivery included interventions; Caesarean, forceps or ventouse delivery, were excluded from analysis. In GUI there were 6,390 remaining of the 10,604 mother-infant pairs who were included in the main analysis, with 4,214 excluded, including 114 home births (43 were excluded), and 6,726 hospital births (3,751 were excluded). In UKMCS there were 12,168 mother-infant pairs remaining of 17,521 included in the main analysis, with 5,353 excluded, including 339 home births (1 was excluded) and 11,831 hospital births (5,349 were excluded). There was increased association of breastfeeding and home birth in GUI at all time-points in unadjusted and adjusted analyses. The association of home birth and breastfeeding remained at all time-points, lessened, in UKMCS. After excluding deliveries that included interventions, in unadjusted analysis for all time-points except for at birth, and in adjusted analysis for all time-points except for six months of exclusive breastfeeding.

**Association between Breast Feeding and Home birth versus hospital birth in UKMCS, is a subset of participants for whom BMI was available.**

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<b>Breast feeding time-point</b>	<b>Study population</b>	<b>Adjusted Analysis</b>		
		<b>OR</b>	<b>Confidence interval (95% CI)</b>	<b>p-value</b>
<i>Initiation</i>	UKMCS	2.80	2.01-3.99	<0.0001
<i>8 weeks</i>	UKMCS	2.60	1.97-3.47	<0.0001
<i>6 months</i>	UKMCS	3.09	2.36-4.03	<0.0001
<i>6 months: exclusive</i>	UKMCS	2.50	1.26-4.53	0.004

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## **Appendix E: Support and breastfeeding**

Maternal support was not found to be associated with breastfeeding, either through a co-resident parent or through other measures including positive levels of perceived support (GUI) and use of available supports (UKMCS). Increased breastfeeding rates were not found with presence of a partner in GUI, and in the UKMCS there was a variable association present; at birth there was, surprisingly, an inverse association for breastfeeding and a maternal partner (OR= 0.731, 95% CI: 0.670- 0.799), at 8 weeks no association was found, and at six months there was a positive association present (1.234 [1.104-1.381]), though not for exclusive breastfeeding at this time point. In GUI, an inverse association for breastfeeding and mothers who perceived the support that they received as being adequate was found. An association was found at all time-points for breastfeeding and mothers who reported that their family lived abroad (at six months OR= 1.53 [1.24-1.89]), and also for mothers who reported not needing any help (at six months OR= 1.33 [1.04-1.70]), and for mothers who reported not getting enough help (at six months OR= 1.37 [1.13-1.67]); versus mothers who reported getting enough help. Selected measures of support in UKMCS were positively associated with breastfeeding at birth, 8 weeks and 6 months, with support from a religious group (OR= 2.610 [1.310-5.836], 2.383 [1.421-4.143] and 1.835 [1.152-2.912], respectively), and support from a health visitor (1.195 [1.080-1.321], 1.189 [1.084-1.305] and 1.285 [1.154-1.431]), showing a sustained association over these time points, with lack of support inversely associated with breastfeeding at birth and at eight weeks (OR= 0.818 [0.749-0.893] and 0.839 [0.771-0.914] respectively). No measures of support were associated with exclusively breastfeeding at six months, and the inverse association with lack of support was also not present at this time point in UKMCS.



**Appendix F: Associations, Positive and Inverse, of Home Birth versus Hospital Birth.**

<b>Analysis</b>	<b>Variable</b>	<b>OR</b>	<b>Confidence interval (95%)</b>	<b>p-value</b>
<b>Home Birth versus Hospital Birth: GUI</b>	Education level: >degree	3.62	1.50- 8.74	0.0041
	Gestation	1.15	1.03-1.30	0.0156
	perceived support: none	2.22	1.22- 4.03	0.0089
	Caesarean delivery	0.55	0.34 -0.90	0.0178
<b>Home Birth versus Hospital Birth: UKMCS</b>	Education level: high	2.26	1.16 - 4.38	0.041
	Education level: none	0.58	0.33 - 1.02	0.05
	Gestation	1.02	1.01 - 1.03	0.001
	Parity: primiparous	0.30	0.23 - 0.39	<0.001
	Age	1.03	1.01- 1.06	0.001
	Maternal ethnicity: Indian	0.23	0.04 - 0.72	0.038
	Maternal ethnicity: Bangladeshi & Pakistani	0.29	0.12 - 0.60	0.002
	SES: manager	1.55	1.07 - 2.27	0.051
SES: self employed	2.26	1.35 - 3.71	0.002	

The associations, in GUI and in UKMCS, of home birth versus hospital birth are shown. Both cohorts share a positive association of higher education level with home birth (GUI 3.62 [1.50-8.74], UKMCS 2.26 [1.16-4.38]), with lower education level having an inverse association with home birth in the UK (0.58 [0.33-1.02]), and also share an association of increasing gestation with home birth (GUI 1.15 [1.03-1.30], UKMCS 1.02 [1.01 - 1.03]). Other associations include, in GUI, positive association with low level of perceived support, and an inverse association with Caesarean delivery, and in UKMCS, positive association with increasing age and higher socioeconomic status, inverse association with primiparity and ethnicity: Asian.

## GUI, Planned Home Birth versus Hospital Birth

Variables		GUI: Total		Home birth		Hospital birth	
		n	proportion (%)	n	proportion (%)	n	proportion (%)
Total		10604	100	157	100	10447	100
Age	<30	3453	33	46	29	3407	33
	30-35	3662	35	50	32	3612	35
	≥35	3489	33	61	39	3428	33
Marital status	Single parent	1272	12	19	12	1253	12
Parity	Primiparous	4312	41	59	38	4253	41
	Multiparous	6292	59	98	62	6194	59
Education	≤ lower second	1236	12	9	6	1227	12
	upper second.	3467	33	40	25	3427	33
	non degree	2038	19	26	17	2012	19
	degree	3854	36	81	52	3773	36
Socio-economic status	never work	1193	11	16	10.0	1177	11
	unskilled	971	9	15	10	956	9
	semiskilled	3213	30	42	27	3171	30
	Manager/Prof.	5172	49	83	53	5089	49
	otherwise emp.	55	1	1	0.6	54	0.5
household equivalent income (€)	<10k (€)	1539	15	21	13.0	1518	15
	≥10k <20k	3681	35	61	39.0	3620	35
	≥20k <30k	2538	24	36	23.0	2502	24
	≥30k	2034	19	24	15.0	2010	19
	Missing	812	8	15	10.0	797	8
ethnicity	Irish	8736	78	113	72.0	8263	79
	Other white	1471	13	31	19.7	1440	14
	Black	361	3	8	5.1	353	3
	Asian	301	3	4	2.5	297	3
	Other	52	0	1	0.6	51	0
Smoking	Current smoker	2559	24	29	18.5	2530	24
Alcohol use	Rare/never	1893	18	26	16.6	1867	18
Alcohol consumption	<7U/week	8109	76	129	82.2	7980	76
	7-14U/week	1760	17	18	11.5	1742	17
	≥14uUweek	727	7	10	6.4	717	7
BMI	<25	5496	52	86	54.8	2383	23
	25-30	2967	28	42	26.8	2925	28
	≥30	1634	15	26	16.6	1608	15
	Missing	534	5	3	1.9	531	5
Infant gender	Female	5180	49	84	53.5	5096	49
gestational age	<37 weeks	627	6	9	5.7	618	6
	≥37 weeks	9940	94	147	93.6	9793	94
Mode of Delivery	SVD	6350	60	113	72.0	6237	60
	Assisted	1527	14	17	10.8	1510	14
	Cesarean	2687	25	26	16.6	2661	25
	Breech	38	0.4	1	0.6	37	0.4
Folate	Folate usage	6511	61	102	65.0	6409	61
birth weight	<2.5kg	494	5	4	2.5	490	5

n= number of cases. within education, second.= secondary school (school from age ~12-18). Prof.= professional. Otherwise emp.= otherwise gainfully employed.

Household Equivalised Income= annual income of household, calculated as disposable household income divided by equivalised household size. U= units of

alcohol, where one unit is 10mL of pure alcohol, BMI= Body Mass Index (maternal, post-delivery,  $\text{kg}/\text{m}^2$ ). SVD= Spontaneous Vaginal Delivery.

Distribution of selected variables at in mothers who underwent planned home birth and mothers who had planned hospital birth are shown. Some mothers who had planned to give birth at home ultimately delivered via Caesarean Section (n=26, 17.7% of all those who planned home birth).

## UKMCS, Home Birth versus Hospital Birth

UKMCS		UKMCS: Total		UKMCS: Home birth		UKMCS: Hospital birth	
		n	proportion (%)	n	proportion (%)	n	proportion (%)
Variables							
Total		17521	100	340	2	17181	98
Maternal Age	<30	9762	56	114	42	9592	56
	30-35	5042	27	118	35	4918	29
	>=35	2764	16	78	23	2668	15
Marital status	Single parent	7121	41	126	37	6972	41
Parity	Multiparous	8596	49	258	76	8324	41
	Primiparous	8975	51	82	24	8857	52
Maternal education	NVQ level 1-3	9039	52	160	47	8861	52
	NVQ level 4-5	5093	29	139	41	4950	29
	Overseas qualification only	542	3	10	3	532	3
	No qualification	2846	17	31	9	2806	16
Socio-economic status*	Never worked	2114	12	27	8	2066	12
	Lower	948	5	18	5	926	5
	Intermediate	2929	17	45	13	2882	18
	Routine Emp.	6400	36	104	31	6280	36
	Small Employer	624	4	25	7	597	3
	Manag./Prof.	4556	26	121	36	4430	26
Household Equivalised Income	<20%	9593	55	181	53	9387	55
	20-40%	5661	32	118	35	5538	33
	40-60%	1639	10	30	9	1609	10
	≥60%	479	3	11	3	367	2
Ethnicity	White	14677	84	305	90	14346	83
	Black	644	4	16	5	626	4
	Asian†	1691	9	9	3	1679	10
	Other	511	3	9	3	502	3
Maternal smoking status	Current smoker	5274	30	102	30	5157	30
Maternal Alcohol Consumption‡	Everyday	372	2	13	3	358	2
	5-6 x/ week	353	2	11	3	342	2
	<2x/week	5597	32	148	43	5438	32
	<2x times/ month	6945	40	114	34	6818	40
	Never	4281	24	54	16	4221	25
Maternal BMI	<18	612	4	14	5	598	4
	18-25	8691	57	180	60	8498	57
	25-30	3920	26	75	25	3835	26
	≥30	1982	13	32	10	1946	13
Infant Gender	Female	8523	49	159	47	8344	49
Gestation	<37 weeks	1055	6	7	2	1048	6
	≥ 37 weeks	16274	94	328	98	15944	94
Mode of delivery	SVD	12168	69	339	100	11829	69
	Assisted delivery	1685	10	1	0.003	1684	10
	Caesarian delivery	3665	21	0	0	3665	21

n= number of cases. BMI= Body Mass Index (maternal, measured post-delivery, kg/m<sup>2</sup>).

\*Maternal employment is classified according to the National Statistics, Socio-Economic Classification [75], a five-part classification system, Manag.= Managerial, Prof.=Professional, Education level is classified according to National Vocation Qualification (NVQ) level; NVQ level 3 corresponds to a qualification of A-levels standard (school leaving exams at 18 years of age) and level 4 is at Certificate level, a qualification immediately above leaving-school level, Quali.= qualification.

†corresponds to Indian, Bangladeshi, or Pakistani nationality.

‡ Alcohol Consumption the reported figures are frequency of alcohol consumption (not units of alcohol consumption).