

Are breastfeeding rates higher among mothers delivering in Baby Friendly accredited maternity units in the UK?

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Background The promotion and support of breastfeeding is a global priority with benefits for maternal and infant health, particularly in low-income and middle-income countries where its relevance for child survival is undisputed. However, breastfeeding rates are strikingly low in some higher-income countries, including the UK. Evidence to support the effectiveness of public health interventions to increase rates of breastfeeding initiation and duration in this setting is limited. We examined whether mothers were more likely to start and continue to breastfeed if they delivered in a UNICEF UK Baby Friendly accredited maternity unit, in a cohort with a high representation of disadvantaged and lower socioeconomic groups with traditionally low rates of breastfeeding.

Methods We analysed maternally reported breastfeeding initiation and prevalence of any breastfeeding at 1 month for 17 359 singleton infants according to maternity unit Baby Friendly Initiative participation status at birth (accredited, certificated, or neither award).

Results Mothers delivering in accredited maternity units were more likely to start breastfeeding than those delivering in units with neither award [adjusted rate ratio: 1.10, 95% confidence interval (CI) 1.05–1.15], but were not more likely to breastfeed at 1 month (0.96, 95% CI 0.84–1.09), after adjustment for social, demographic, and obstetric factors. Antenatal class attendance (1.14, 95% CI 1.11–1.17), vaginal delivery (1.05, 1.03–1.08), a companion at delivery (1.09, 1.04–1.16), and maternal post-partum hospital stay >24 h (1.06, 1.04–1.09) were also independently associated with breastfeeding initiation.

Conclusions Policies to increase the proportion of maternity units participating in the UNICEF UK Baby Friendly Initiative are likely to increase breastfeeding initiation but not duration. Other strategies are required in order to support UK mothers to breastfeed for the recommended duration.

Keywords breastfeeding, Baby Friendly Hospital Initiative, inequalities, policy

The promotion and support of breastfeeding is a global priority with benefits for maternal and infant health, especially in low-income and middle-income countries where the relevance for child survival is undisputed.¹ Breastfeeding rates show marked social inequalities in higher-income countries, where a signi-

ficant proportion of infants are not receiving the best nutritional start in life and resultant health benefits. One of these countries is the UK, which has one of the lowest breastfeeding rates in Europe,² with rates conspicuously below those of Scandinavian countries; only 22% of UK infants receive any breast milk at age 6 months³ compared with 72% in Sweden.⁴ Although a number of interventions have been introduced and targets set^{5–8} to increase rates of breastfeeding initiation and duration in the UK, evidence for their effectiveness is limited.

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One proposal under consideration by the National Institute of Health and Clinical Excellence is the UK-wide implementation of the UNICEF UK Baby Friendly Initiative. The Baby Friendly Hospital Initiative is a WHO/UNICEF global campaign that provides information, support, and assessment for implementation of best practice standards for the promotion and support of breastfeeding in maternity services.⁹ Hospitals are classified according to compliance with the evidence-based *Ten Steps to Successful Breastfeeding* (Box 1)^{10,11} and are evaluated by an external assessment and award programme. The Baby Friendly Initiative was introduced into UK maternity services in 1993, by UNICEF UK Baby Friendly and the Department of Health,^{12–14} but by March 2001 only 31 maternity units in the UK had been awarded the Baby Friendly Full Accreditation Award, with a further 68 units a Certificate of Commitment,¹⁵ out of ~277 maternity units in the UK. Furthermore, there has been no large-scale study of the impact of this intervention on breastfeeding initiation and duration, although a study based in Scotland has provided some evidence for an association between birth in a Baby Friendly facility and increased rates of breastfeeding at 1 week of age.^{16,17}

The purpose of our study was to determine whether breastfeeding rates in the UK were higher among mothers delivering in Baby Friendly accredited maternity units, using data from the Millennium Cohort Study.¹⁸ Specifically we assessed breastfeeding initiation and the prevalence of any breastfeeding at 1 month after adjustment for maternal factors known to influence a mother's decision to breastfeed.

Box 1 The Baby Friendly Hospital: Ten Steps to Successful Breastfeeding

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- Step 1 Have a written breastfeeding policy that is routinely communicated to all healthcare staff
 - Step 2 Train all healthcare staff in the skills necessary to implement this policy
 - Step 3 Inform all women (face to face and leaflets) about the benefits and management of breastfeeding
 - Step 4 Help mothers initiate breastfeeding soon after delivery
 - Step 5 Show mothers how to breastfeed and how to maintain lactation (by expressing milk) even if they should be separated from their infants
 - Step 6 Give newborn infants no food or drink other than breast milk, unless medically indicated
 - Step 7 Practice rooming in. All mothers should have their infant cots next to them 24 hours a day
 - Step 8 Encourage breastfeeding on demand
 - Step 9 Give no artificial teats or pacifiers to breastfeeding infants
 - Step 10 Foster the establishment of breastfeeding support groups and refer mothers to them

Methods

Study population

The Millennium Cohort Study is a UK-wide cohort study of the social, economic, and health-related circumstances of the new century's babies and their families. The cohort comprises 18 819 children from 18 553 families, born between September 2000 and September 2001 (England and Wales) and November 2000 and January 2002 (Scotland and Northern Ireland), resident in the UK and eligible to receive child benefit. The sample was stratified by country and electoral ward type to over-represent families in Wales, Scotland, and Northern Ireland, and wards with a high proportion of disadvantaged and ethnic minority families.¹⁹ Electoral wards were defined as ethnic minority (at least 30% of population 'Black' or 'Asian', 1991 census), with the remainder defined as disadvantaged (upper quartile Child Poverty Index²⁰) or advantaged (not in upper quartile Child Poverty Index). The first contact with the cohort was at infant age 9 months, when mothers and their partners were interviewed in their homes and information obtained on a number of factors including the circumstances of pregnancy and delivery, and infant feeding practices since birth.²¹ The overall response rate was 72%.¹⁹

Maternity hospitals

At interview, mothers were asked to name the maternity unit in which they gave birth to their child. Data were obtained from UNICEF UK Baby Friendly, from which the stage of accreditation for each respective maternity unit at the date of birth of the cohort child was derived, and linked to individual Millennium Cohort Study data for each mother–infant pair. Facilities that had received the Baby Friendly Full Accreditation Award were classified as 'accredited' and those with a Certificate of Commitment as 'certificated', according to the staged approach for award attainment (Box 2).²² Hospitals not participating in the Baby Friendly Initiative were defined as 'neither award'.

Mother–infant pairs

From a total of 18 819 mother–infant pairs, we selected 18 150 singleton infants, excluding those with multiple conceptions (156), or multiple births (512), or where the natural mother was not the survey respondent (1). We also excluded those with no missing breastfeeding data (3), or who were born outside the UK (25), or who moved UK country between birth and 9 months (144), or were delivered at home (346) or on the way to hospital (36), or for whom hospital of birth was missing or not identified (95) or were delivered in units where the Baby Friendly Accreditation Award had been removed (142). A total of 17 359 mother–infant pairs in the four countries of the UK were included in the analyses.

Outcome measures

Breastfeeding initiation was defined from the response to two feed-forward questions: those responding positively to the question 'did you ever try to breastfeed?' were asked 'how old was <cohort child> when s/he last had breastmilk?'²³ The second question had the optional response of 'never took breastmilk' and a selection of age categories. We defined

Box 2 Criteria for the UNICEF UK Baby Friendly Initiative awards

Full Accreditation Award

- Full implementation of the Ten Steps
- Annual audit of compliance and Progress Monitoring Visits
- Re-assessment 24 months after initial award
- Collection and submission of breastfeeding statistics

Certificate of Commitment

- Adopt a policy covering all Ten Steps with adoption of Step 10
- Action planning visit from UNICEF UK Baby Friendly
- Implementation schedule for action plan within 24 months
- Formal mechanism for recording breastfeeding statistics

mothers as having initiated breastfeeding if they gave a positive answer to the question 'did you every try to breastfeed' and did not respond with 'never took breast milk' to the second question.³

At the time of the Millennium Cohort birth period, the Department of Health recommended that mothers should not introduce solid foods until 4–6 months, a recommendation subsequently revised in 2003 to exclusive breastfeeding²⁴ for the first 6 months of life, following updated WHO infant feeding guidelines.^{25,26} In the Millennium Cohort only 16% of cohort babies were fully breastfed to 4 months and 1% to 6 months of age³; and, owing to these low figures we examined the prevalence of any breastfeeding at one calendar month after birth and continuation of any breastfeeding for at least 1 month for those mothers who started to breastfeed.

Explanatory variables

The main variable of interest was the Baby Friendly participation status for hospital of delivery. We also considered the circumstances of pregnancy and delivery; whether the cohort pregnancy was planned, whether the mother attended antenatal classes, and whether she was accompanied by a partner, friend, or relative at time of delivery. Obstetric factors considered were mode of delivery, (emergency, elective caesarean, or vaginal delivery), admission to special or neonatal intensive care, and duration of maternal post-partum hospital stay (≤ 24 h, >24 h). Area and individual maternal characteristics included country of residence, ward type, socioeconomic status, ethnicity (defined by Office for National Statistics guidelines and classified for this analysis as British/Irish white³ or of other ethnic origin), maternal age in years at cohort

child's birth, level of education (attainment of qualification at GCSE grade G or above), parity (whether cohort child is first live birth), and lone parent status.

Statistical analysis

The unit for all analyses was the mother–infant pair. Descriptive statistics were reported for maternal demographic, social, and obstetric characteristics by maternity unit Baby Friendly status with a comparison of percentages, weighted for design effect (F statistic²⁷ significance $P \leq 0.05$). The proportion of births by Baby Friendly status was not weighted owing to independence from survey design. Multivariable Poisson regression²⁸ was performed to report crude and adjusted rate ratios as a measure of relative risks for the association between Baby Friendly status and breastfeeding initiation, any breastfeeding at 1 month and breastfeeding continuation to 1 month. Variables that were significant in the unadjusted analysis were selected for inclusion in the final regression model (significance $P \leq 0.05$), after adjustment for factors known to be associated with breastfeeding.³ Admission to neonatal/special care was retained in the final model owing to a potential confounding relationship with length of maternal hospital stay. All analyses were conducted using STATA 8.2 (Stata Corporation, TX), with sample weights and survey commands to allow for the clustered sample design and estimate robust standard errors. We conducted a sensitivity analysis to examine the influence of hospitals that were within 1 and 2 years of attainment of accreditation at the date of birth of the cohort child.

Results

The 17359 cohort infants were delivered in 248 (90%) of the estimated 277 maternity units in the UK at that time (Table 1), with a higher proportion of Baby Friendly accredited or certificated units in Scotland than the other UK countries. Overall, 7.4% of cohort births were in accredited units, with a further 31.0% in certificated facilities (Figure 1). These proportions varied significantly by country with the highest proportion of cohort births in accredited facilities in Scotland (24.2%) and the lowest in England (3.0%). Social, demographic, and obstetric characteristics were similar for mothers attending each category of hospital, with the exception of duration of maternal post-partum hospital stay: a significantly higher proportion of mothers delivering in accredited facilities stayed >24 h in hospital following delivery (Table 2).

For the UK as a whole, 70% of mothers started to breastfeed and 49.3% breastfed at 1 month (Table 3). There was significant variation between UK countries in these proportions, which were highest in England and lowest in Northern Ireland. The unadjusted prevalence of breastfeeding initiation was highest amongst those delivering in accredited maternity units and, with the exception of England, lowest for those delivering in certificated units. Unadjusted rates of any breastfeeding at 1 month showed different patterns, being highest in maternity units with neither award in Scotland and Northern Ireland and lowest in certificated units in all countries with the exception of England. Unadjusted rates of

continuation of breastfeeding were also highest in maternity units with neither award in England, Scotland, and Northern Ireland but lowest in accredited units in England and Northern Ireland, and certificated units in Wales and Scotland (Supplementary Table 1 available at *IJE* online).

After adjustment for country of residence and individual social, demographic, and obstetric characteristics, mothers who delivered in an accredited hospital were 10% more likely to start breastfeeding: adjusted rate ratio [95% confidence interval (CI): 1.10 (1.05–1.15)], than those who delivered in a unit with neither award (Table 4). Breastfeeding initiation was not significantly associated with delivery in a certificated unit. Other factors independently associated with starting to breastfeed were country of residence, a planned pregnancy, attendance at antenatal classes, vaginal delivery, being accompanied at delivery, and a post-partum hospital stay of >24 h

(Table 4). Delivery in an accredited or certificated unit was not associated with breastfeeding prevalence at 1 month (Table 5). Maternal factors independently associated with any breastfeeding at 1 month were country of residence, a planned pregnancy, attendance at antenatal classes, and a vaginal delivery (Table 5), and these factors, with the exception of a planned pregnancy, were also significantly associated with continuation of breastfeeding (Supplementary Table 2 available at *IJE* online). There were no significant interactions between Baby Friendly status and any variables for the three outcome measures.

The association between accreditation and initiation was attenuated but remained significant when maternity units were re-classified as accredited when within 1 and 2 years of attainment of accreditation at the date of cohort child birth: adjusted rate ratio (95% CI) 1.04 (1.00–1.09) within 1 year, and 1.04 (1.00–1.08) within 2 years.

Table 1 Maternity units of cohort member birth: by UK country and Baby Friendly participation status

Baby Friendly status ^a	Number of maternity units in the Millennium Cohort Study				
	England	Wales	Scotland	Northern Ireland	UK
Accredited	8	1	4	1	14
Certificated	44	5	12	2	63
Neither award	142	13	7	9	171
Total	194	19	23	12	248 ^b

Data source: UNICEF UK Baby Friendly

^a Participation of hospital at mid-point of cohort birth period, 1 March 2001 (England and Wales), 1 June 2001 (Scotland and Northern Ireland).

^b Four maternity units in England held a Full Accreditation Award that was subsequently removed.

Discussion

This is to our knowledge the first UK-wide evaluation of the Baby Friendly Initiative, and our findings provide evidence to support this policy as an intervention to increase rates of breastfeeding initiation. We found that mothers who delivered in maternity units holding the Baby Friendly Full Accreditation Award were 10% more likely to start breastfeeding, having accounted for area, and individual social and demographic factors already known to be associated with breastfeeding. We did not find any similar effect for delivery in a maternity unit holding the Certificate of Commitment. This association with delivery in an accredited unit is, however, short-lived, and mothers delivering in such facilities were not more likely to be breastfeeding at 1 month after birth. In addition, factors amenable to health service policy change, including attendance at antenatal classes, a vaginal delivery, a companion at

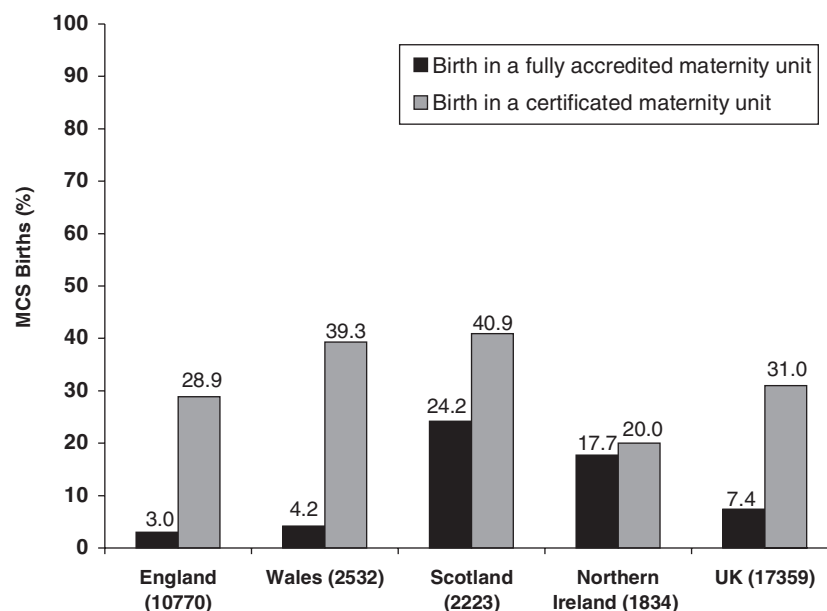


Figure 1 Proportion of Millennium Cohort Study births in Baby Friendly accredited and certificated units by UK country

Table 2 Maternal demographic, social, and obstetric characteristics by Baby Friendly status

Maternal characteristics	Baby Friendly status		
	Accredited % (n) N = 1292	Certificated % (n) N = 5387	Neither award % (n) N = 10 680
Socioeconomic Status			
Professional and managerial	35.7 (407)	30.2 (1285)	31.0 (2804)
Intermediate occupations	21.6 (272)	23.5 (1092)	22.3 (2147)
Routine and manual	36.2 (516)	38.8 (2257)	34.6 (4538)
Never worked and long term unemployed	6.4 (82)	7.5 (669)	6.7 (1084)
British/Irish White	93.9 (1209)	85.8 (4306)	86.7 (8710)
Attained academic qualifications	84.8 (1062)	84.5 (4231)	85.7 (8630)
Lone parent	14.0 (195)	14.7 (1017)	13.4 (1771)
Nulliparous	44.0 (570)	43.3 (2230)	43.6 (4457)
Planned pregnancy	59.3 (724)	56.3 (2761)	58.9 (5876)
Attended antenatal classes	41.6 (525)	37.6 (1780)	38.5 (3591)
Accompanied at delivery	96.6 (1246)	95.7 (5089)	95.7 (10 102)
Vaginal delivery	77.2 (984)	78.3 (4237)	78.4 (8358)
Baby admitted to special/intensive care	10.4 (134)	8.5 (477)	8.8 (920)
Duration of maternal hospital stay			
≤24 h	28.7 (346)	39.6 (1991)	38.7 (3951)*
>24 h	71.3 (946)	60.4 (3394)	61.3 (6729)
Maternal age median (inter-quartile range)	29 (24–33)	28 (23–32)	29 (24–33)

Weighted percentages (n).

Missing data: socioeconomic status (206), ethnicity (28), academic qualifications (46), maternal age (6), parity (222), planned pregnancy (27), antenatal classes (654), accompanied at delivery (1), mode of delivery (26), duration of maternal hospital stay (2).

* $P < 0.001$ Comparison of proportions (F statistic).

Table 3 Prevalence of breastfeeding initiation and any breastfeeding at 1 month, by UK country and Baby Friendly status

	England	Wales	Scotland	Northern Ireland	UK
Millennium Cohort Study births (N)	10 770	2532	2223	1834	17 359
Breastfeeding initiation					
All	71.9 (7649)	61.7 (1466)	64.6 (1385)	51.3 (874)	70.0* (11 374)
Accredited	78.0 (241)	72.9 (75)	67.2 (354)	58.3 (177)	71.3 (847)
Certificated	73.9 (2264)	60.2 (556)	62.6 (544)	44.5 (158)	70.8 (3522)
Neither award	70.8 (5144)	62.0 (835)	65.3 (487)	51.3 (539)	69.5 (7005)
Any breastfeeding at 1 month					
All	51.4 (5413)	38.9 (885)	44.7 (934)	28.7 (466)	49.3* (7698)
Accredited	47.0 (128)	54.1 (55)	45.8 (239)	28.4 (81)	44.6 (503)
Certificated	53.0 (1554)	36.7 (317)	42.4 (357)	23.8 (78)	49.9 (2306)
Neither award	51.0 (3731)	39.3 (513)	46.7 (338)	30.3 (307)	49.5 (4889)

Weighted percentages (n).

* $P < 0.001$ for comparison of proportions between countries (F statistic).

delivery, and a post-partum hospital stay of >24 h were independently and positively associated with breastfeeding initiation. With the exception of duration of hospital stay and a delivery companion, these factors were also associated with any breastfeeding for at least 1 month.

Previous attempts to evaluate the Baby Friendly Initiative within an observational study design have often been limited by small sample size or reliance upon ecological measures of confounding factors.^{16,17} The advantage of the Millennium Cohort Study is the availability of individual-level social and

demographic information, as well as the circumstances of pregnancy and delivery, allowing adjustment for factors that in other studies may be associated with both policy intervention and infant feeding practices, via area or individual population differences. The cohort has a high representation of women from disadvantaged and lower socioeconomic groups, who are of particular interest in the targeting of breastfeeding interventions.^{29,30} We cannot exclude residual confounding by factors that we were not able to account for within this observational study. In particular we have no data on

Table 4 Factors associated with breastfeeding initiation in the UK

Measures	% (n)*	Crude RR (95% CI)	Adjusted† RR (95% CI)
Baby Friendly status			
Accredited	6.0 (1292)	1.02 (0.97–1.07)	1.10 (1.05–1.15)
Certificated	28.9 (5387)	1.03 (0.95–1.10)	1.02 (0.99–1.05)
Neither award	65.1 (10 680)	1	1
Country			
England	81.8 (10 770)	1.41 (1.30–1.52)	1.34 (1.25–1.43)
Wales	5.0 (2532)	1.21 (1.09–1.33)	1.28 (1.19–1.38)
Scotland	9.6 (2223)	1.26 (1.15–1.38)	1.19 (1.10–1.28)
Northern Ireland	3.5 (1834)	1	1
Planned pregnancy			
Yes	58.2 (9361)	1.24 (1.20–1.28)	1.04 (1.02–1.06)
No	41.8 (7971)	1	1
Attended antenatal classes			
Yes	38.4 (5896)	1.27 (1.23–1.30)	1.14 (1.11–1.17)
No	61.6 (10 809)	1	1
Mode of delivery			
Vaginal	78.3 (13 579)	0.96 (0.94–0.99)	1.05 (1.03–1.08)
Caesarean	21.7 (3754)	1	1
Accompanied at delivery			
Yes	95.8 (16 437)	1.21 (1.13–1.30)	1.09 (1.04–1.16)
No	4.2 (921)	1	1
Baby admitted to special/intensive care			
Yes	8.8 (1531)	1.03 (0.99–1.07)	1.03 (0.99–1.07)
No	91.2 (15 828)	1	1
Duration of maternal hospital stay			
> 24 h	61.6 (11 069)	1.10 (1.06–1.13)	1.06 (1.04–1.09)
≤24 h	38.4 (6288)	1	1

Weighted percentages (n), crude and adjusted relative rate ratios (95% CI). Missing cases for variables: planned pregnancy (27), attended antenatal classes (654), mode of delivery (26), accompanied at delivery (1), duration of maternal hospital stay (2).

* Column shows weighted percentage of mother–infant pairs in each category (n).

† Adjusted for ward type, socioeconomic status, ethnicity, academic qualifications, maternal age, parity, and lone parent status.

breastfeeding rates by maternity unit prior to accreditation. However, in the context of policy targeting, participating facilities are more likely to be located in areas with traditionally low breastfeeding rates³¹ and confounding by indication is likely to underestimate the effect of accreditation in a cross-sectional study.

Although in this study information on breastfeeding practice was reliant upon maternal recall at 9 months, breastfeeding figures are in agreement with data collected prospectively in the UK Infant Feeding Survey conducted in 2000.³² Likewise, the validity of maternal recall of the circumstances of pregnancy and delivery has been shown to be accurate.³³ We were unable to adjust for maternal intention to breastfeed at antenatal booking, a factor shown to be important in previous studies³⁴ as this information was not collected in the survey.

Table 5 Factors associated with any breastfeeding at one calendar month (all mothers)

Measures	% (n)*	Crude RR (95% CI)	Adjusted† RR (95% CI)
Baby Friendly status			
Accredited	6.0 (1292)	0.90 (0.72–1.13)	0.96 (0.84–1.09)
Certificated	28.9 (5387)	1.01 (0.93–1.09)	0.96 (0.91–1.01)
Neither award	65.1 (10 680)	1	1
Country			
England	81.8 (10 770)	1.80 (1.56–2.07)	1.64 (1.47–1.84)
Wales	5.0 (2532)	1.36 (1.15–1.61)	1.47 (1.30–1.66)
Scotland	9.6 (2223)	1.56 (1.34–1.83)	1.49 (1.32–1.69)
Northern Ireland	3.5 (1834)	1	1
Planned pregnancy			
Yes	58.2 (9361)	1.37 (1.31–1.43)	1.06 (1.02–1.09)
No	41.8 (7971)	1	1
Attended antenatal classes			
Yes	38.4 (5896)	1.30 (1.24–1.36)	1.22 (1.17–1.26)
No	61.6 (10 809)	1	1
Mode of Delivery			
Vaginal	78.3 (13 579)	1.02 (0.98–1.07)	1.14 (1.10–1.18)
Caesarean	21.7 (3754)	1	1
Accompanied at delivery			
Yes	95.8 (16 437)	1.19 (1.07–1.31)	1.05 (0.98–1.13)
No	4.2 (921)	1	1
Baby admitted to special/neonatal care			
Yes	8.8 (1531)	1.00 (0.93–1.07)	1.01 (0.95–1.07)
No	91.2 (15 828)	1	1
Duration of maternal hospital stay			
>24 h	61.6 (11 069)	1.03 (0.98–1.07)	1.02 (0.98–1.06)
≤24 h	38.4 (6288)	1	1

Missing cases for variables: planned pregnancy (27), attended antenatal classes (654), mode of delivery (26), accompanied at delivery (1), duration of maternal hospital stay (2).

* Column shows weighted percentage of mother–infant pairs in each category (n).

† Adjusted for ward type, socioeconomic status, ethnicity, academic qualifications, maternal age, parity, and lone parent status.

Although not directly comparable, our findings are in broad agreement with those from routine data in Scotland that have indicated a positive association between Baby Friendly accreditation, but not certification, and breastfeeding at 1 week of age.¹⁷ Our findings reinforce those of Coutinho and colleagues who reported that high exclusive breastfeeding rates achieved in Brazilian hospitals implementing staff training with the course content of the Baby Friendly Hospital Initiative were short-lived and not sustained at home unless implemented in combination with post-natal home visits.³⁵ Similarly in Italy, training of staff with an adapted version of the Baby Friendly course content resulted in high breastfeeding rates at discharge, with a rapid decrease in the days after leaving hospital.³⁶ In contrast, a cluster randomized trial in Belarus (PROBIT) found an association between an intervention modelled on the Baby Friendly Initiative with an increased duration of

breastfeeding³⁷ an association also reported from an observational study in Germany.³⁸ Mothers in Belarus stay in hospital post-partum for 6–7 days, and in Germany for 5 days, with post-natal support likely to be particularly important in countries where mothers stay in the hospital for a shorter time, with early discharge likely to limit the influence of a hospital-based intervention. Although in our study a significantly higher proportion of women delivering in UK accredited maternity units stayed in hospital >24 h post-partum, we did not find any interaction between Baby Friendly status and duration of stay. In addition, the social, demographic, and cultural determinants of breastfeeding,³ and background low rates of breastfeeding in the UK may limit the generalization of findings from policy implementation studies in other European countries. We did not find any evidence that the Baby Friendly intervention was associated with inequity of benefit by maternal characteristics as suggested elsewhere.³⁵ Our findings suggest that implementation of the UNICEF UK Baby Friendly Initiative in isolation is unlikely to be effective in extending the duration of breastfeeding. Additional health service policy changes will be required in order to increase the proportion of infants in the UK fed in accordance with WHO recommendations. As we have suggested previously,^{3,39} use of routine data to evaluate the effectiveness of local or national policy changes over time, or between areas, with respect to breastfeeding rates needs to account for differences in ethnic composition and socioeconomic status.

Our findings have highlighted the importance of provision of support to mothers after they leave the maternity unit. Although Step 10 of the UNICEF UK Baby Friendly Initiatives requires that accredited maternity units provide post-natal breastfeeding support groups, the availability and uptake of these services remains unclear.⁴⁰ The effectiveness of peer-support for long-term breastfeeding success has been well documented in middle-income countries,^{35,41} and a systematic review has emphasized the importance of skilled post-natal breastfeeding support in the UK.³⁹ However Graffy *et al.*⁴⁰ concluded from a randomized controlled trial of support provided by volunteer breastfeeding counsellors that although such support was rated by mothers as helpful, volunteer support was not effective at increasing breastfeeding duration, perhaps owing to mothers not actively taking up such support. There is limited evidence for the effectiveness of primary care involvement with the Baby Friendly Initiative through the community health care facility award,⁴³ and a formal evaluation of this strategy in the UK is required.

Conclusions

Our findings support the conclusions of previous studies in low-income and middle-income countries suggesting that the benefits of the UNICEF UK Baby Friendly Initiative are transient and not sustained. We conclude that wider implementation of the Baby Friendly Initiative in the UK is unlikely to extend the average duration of breastfeeding. Consideration should be given to a combination of systems with attention given to the provision of support to breastfeeding mothers in the early weeks after birth. A randomized trial in the UK of the Baby Friendly Initiative in conjunction with peer-support

programmes is needed to determine the most effective policy to increase breastfeeding duration.

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Authors' contributions

C.D. had the original idea for the study and together with L.J.G. and S.B. was responsible for developing the research questions addressed in this paper, data analysis, and interpretation. S.B. and L.J.G. linked MCS data to Baby Friendly participation data and together with A.R.T. undertook the statistical analyses. S.B. wrote the first draft of the paper and all authors critically reviewed and contributed to final versions. Andrew Radford (Director UNICEF UK Baby Friendly Initiative) provided data for Baby Friendly participation and gave advice about the procedure for attainment of accreditation. Members of the Millennium Cohort Study Child Health Group contributed to the paper through analysis and construction of explanatory variables and commented on data interpretation and early drafts of the manuscript. C.D. is guarantor.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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Role of the funding source

The funders of this study had no role in the collection analysis or interpretation of data, or writing of the report. The corresponding author had full access to all data in the study and had final responsibility for the decision to submit the paper for publication.

Ethics committee approval

The Millennium Cohort Study was approved by the London Multi Centre Research Ethics Committee. The analyses presented required no further ethical committee approval.

Statement of independence of researchers from funders

The funders of this study had no role in its design, conduct, analysis, and interpretation.

KEY MESSAGES

- The UK has one of the lowest breastfeeding rates in Europe.
- There has been limited evaluation of the effectiveness of the UNICEF UK Baby Friendly Initiative for increasing breastfeeding initiation and duration.
- Mothers delivering in Baby Friendly accredited maternity units are more likely to start breastfeeding than those delivering in certificated units or those with neither award.
- This effect is not sustained and breastfeeding at 1 month is not associated with maternity unit Baby Friendly status.
- Additional interventions will be required to increase duration of breastfeeding in the UK.

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