Original Article

Breastfeeding in England: time trends 2005–2006 to 2012–2013 and inequalities by area profile

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Abstract

Breastfeeding rates in England have risen steadily since the 1970s, but rates remain low and little is known about area-based trends. We report an ecological analysis of time trends in area breastfeeding rates in England using annual data on breastfeeding initiation (2005–2006 to 2012–2013) and any breastfeeding at 6–8 weeks (2008–2009 to 2012–2013) for 151 primary care trusts (PCTs). Overall, breastfeeding initiation rose from 65.5% in 2005–2006 to 72.4% in 2012–2013 (average annual absolute increase 0.9%). There was a statistically significantly higher (interaction $P < 0.001$) annual increase in initiation in PCTs in the most deprived (1.2%) compared with the least deprived tertile (0.7%), and in PCTs with low baseline breastfeeding initiation (2005–2006; 1.4%) compared with high baseline initiation (0.6%). Similar trends were observed when PCTs were stratified by the proportion of teenage mothers and maternal smoking, but not when stratified by ethnicity. Although breastfeeding prevalence at 6–8 weeks also increased significantly over the observed time period (41.2% in 2008–2009, 43.7% in 2012–2013; annual increase 0.7%), there was no difference in the average increase by deprivation profile, ethnicity, teenage mothers and maternal smoking. However, PCTs with low baseline prevalence in 2008–2009 saw a significantly larger annual increase (0.8%) compared with PCTs with high baseline prevalence (0.07%). In conclusion, breastfeeding initiation and prevalence have seen higher increases in areas with low initial breastfeeding, and for initiation, more disadvantaged areas. Although these results suggest that inequalities in breastfeeding have narrowed, rates have plateaued since 2010–2011. Sustained efforts are needed to address breastfeeding inequalities.

Keywords: epidemiology, breastfeeding, inequalities.

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Introduction

Despite strong evidence of the benefits of breastfeeding, the UK has one of the lowest breastfeeding rates among all high income countries (Organisation for Economic Cooperation and Development 2009). Breastfeeding rates – both initiation and continuation – show a steep socio-demographic gradient with initiation and duration

lowest among mothers from lower socio-economic groups, younger mothers, mothers of white ethnicity, those living in more deprived areas and mothers with lower education (McAndrew *et al.* 2012). A recent analysis of area-based breastfeeding rates in England found some of these associations (notably maternal age, deprivation and ethnicity) prevailed at the area level (Oakley *et al.* 2013), and the wide disparity in area-based breastfeeding rates was also highlighted in

the most recent annual report by the Chief Medical Officer for England (Lemer, 2013).

An important contribution to understanding infant feeding in the UK as a whole is the regular reporting of infant feeding data. A quinquennial national survey, the Infant Feeding Survey (IFS), has been conducted since 1975, and gathers infant feeding information from a sample of several thousand new mothers from across the UK. This UK-wide survey is supplemented by country-specific local data such as that reported by the Information Services Division, Scotland (ISD Scotland 2014). In England, local areas have reported rates of breastfeeding initiation (since 2004–2005), and prevalence at 6–8 weeks after birth (since 2007–2008), which allows for analysis of trends over time. These data are reported at a number of aggregate levels, including at primary care trust (PCT) level. Until they were disbanded in April 2013, PCTs in England were the National Health Service administrative bodies responsible for commissioning all primary, community and secondary health services, with an average population size in 2010 of 342 000 people (Primary Care Trust Network 2010).

Data from the IFS suggests that in England, both breastfeeding initiation and continuation have increased over recent years. Between 2005 and 2010, breastfeeding initiation (defined as the baby ever put to the breast or given the mother's breast milk) increased from 78% to 83%, and breastfeeding at 6 weeks rose from 50% to 57% (McAndrew *et al.* 2012). There is some evidence that, particularly for initiation, the largest increases have been among populations less likely to breastfeed. For example, when stratified by socio-economic group, the largest increase in initiation occurred among women in routine and manual occupations (67% to 76%) and

women who had never worked (68% to 74%). IFS data also suggested that between 2005 and 2010, breastfeeding initiation increased more steeply in white mothers compared with mothers from other ethnic groups (McAndrew *et al.* 2012). It is not known whether these trends are replicated at the area level.

The aim of this study was to investigate time trends in breastfeeding rates for all PCTs in England during 2005–2006 to 2012–2013, with a particular reference to inequalities by area profile.

Materials and methods

Infant feeding survey data

Before undertaking the main analysis, we collated information on breastfeeding trends using data from previous IFSs (Foster *et al.* 1997; Hamlyn *et al.* 2002; Bolling *et al.* 2007; McAndrew *et al.* 2012). These data were used to check consistency with DH data, and to illustrate longer term trends in breastfeeding. For the most recent IFS (conducted in 2010), all births in Northern Ireland and Wales during the selected time period were included, along with a random sample of births in England and Scotland. Additionally, in England and Scotland, births to mothers from the most deprived quintile of each country's Index of Multiple Deprivation (IMD) were over-sampled. The response rate to stage one of the 2010 survey was 51%, lower than response rates in previous years (62% in 2005, 72% in 2000).

Data source and outcome (PCT data)

Data on breastfeeding initiation at birth and breastfeeding status at 6–8 weeks are collected in

Key messages

- Area-based inequalities in breastfeeding initiation in England reduced between 2005–2006 and 2012–2013, with breastfeeding initiation rising more sharply in disadvantaged areas and areas with low baseline breastfeeding initiation.
- Between 2008–2009 and 2012–2013, the largest increases in breastfeeding prevalence at 6–8 weeks were in areas with low breastfeeding prevalence in 2008–2009.
- Breastfeeding rates plateaued between 2010–2011 and 2012–2013, and sustained efforts are needed to support breastfeeding, particularly in terms of breastfeeding continuation.

England through the DH Vital Signs Monitoring Return (VSMR) programme, with data reported for each quarter (Q1 April–June, Q2 July–September, Q3 October–December, Q4 January–March). Information on breastfeeding initiation is recorded by midwifery staff, with initiation defined as the mother having put her baby to the breast or the baby being given any of the mother's breast milk within 48 h of delivery. Breastfeeding status at 6–8 weeks is recorded at the time of the routine 6–8-week infant check by the general practitioner or health visitor.

For the analysis reported here, the DH provided actual figures for each annual out-turn for all PCTs in England. In order to meet DH data quality standards, reported data must meet a number of quality criteria: data coverage $\geq 95\%$ for initiation; and $\geq 85\%$ (from Q1-2008–2009 to Q3-2009–2010), $\geq 90\%$ (from Q4-2009–2010 to Q3-2010–2011) or $\geq 95\%$ (from Q4-2010–2011) for prevalence at 6–8 weeks. In addition, data must meet a number of consistency checks. Where the data met quality standards but breastfeeding status was missing for a small number of maternities ($<5\%$), in line with usual DH practice, we assumed that breastfeeding was not initiated. A similar assumption was made for breastfeeding prevalence at 6–8 weeks where breastfeeding status was missing for $<5\%$, $<10\%$ or $<15\%$ of infants, depending on the time period.

For breastfeeding initiation, data for the years 2005–2006 to 2012–2013 were included in the analysis: data from 2004 to 2005 were excluded because of the large number of PCTs failing to meet the data quality threshold for this year (33%, $n = 50$). For breastfeeding prevalence, data from all available years (2008–2009 to 2012–2013) were included. PCTs were only included where they reported a minimum of 5 years acceptable data for breastfeeding initiation annual out-turn (out of a possible 8 years), and a minimum of 3 years acceptable data for breastfeeding prevalence at 6–8 weeks (out of a possible 5 years).

Stratifying variables (PCT data)

Our previous analysis of equivalent data for the year 2010–2011 found that area-based characteristics were strongly associated with breastfeeding rates (Oakley

et al. 2013). For the analysis reported here, PCTs were stratified according to the following area-based characteristics in order to ascertain whether the time trends differed: 'baseline' breastfeeding rate (breastfeeding initiation rate in 2005–2006; breastfeeding prevalence in 2008–2009); IMD 2010 score (population weighted average score for the lower layer super output areas in the PCT; McLennan *et al.* 2011); the proportion of the population from a black or minority ethnic (BME; non-white British) background (2009 estimates; Office of National Statistics 2011); the proportion of births to younger mothers (2010–2011 data; Child and Maternal Health Observatory 2012); and the proportion of mothers who were smokers at the time of delivery (2010–2011 data; Department of Health 2012b). All of these variables were available at the PCT level and for each variable, PCTs were divided into tertiles.

Statistical analysis (PCT data)

Initially, average breastfeeding rates by year were calculated for all PCTs. PCTs were then stratified by the above variables, and average breastfeeding rates by year calculated for these stratified groups. Modified Poisson regression (Zou 2004) was used to estimate risk ratios (RR) for the association between year and breastfeeding, where the RR represents the estimated increase for each year. Analyses were adjusted for clustering at the PCT level. Possible interaction between year and each stratifying variable was tested by adding an interaction term to regression models. Where an interaction term was statistically significant ($P < 0.05$), stratified RRs are presented. We calculated two figures to estimate the average annual change in breastfeeding. The first, average annual relative change, was derived from the RR. Secondly, we calculated the average annual absolute change. This was estimated using the RR derived from the Poisson model and the baseline breastfeeding rate. For example, where the baseline initiation rate was 65.5%, a RR of 1.0142 was equivalent to an average absolute annual increase of 0.93% (65.5×0.0142). Our primary outcome of interest was the average absolute annual increase. All analyses were

conducted using Stata version 13 (StataCorp, College Station, TX, USA).

Results

IFS data indicate dramatic increases in breastfeeding initiation and prevalence since the first survey was conducted in 1975. According to the 1975 IFS, only 51% of mothers initiated breastfeeding and just 20% were still breastfeeding at 6 weeks (combined data for England and Wales, Fig. 1). By 2010, these figures had increased to 83% and 57%, respectively (England only).

One hundred and fifty-one PCTs were eligible for inclusion in our analysis of time trends in DH breastfeeding data. The average breastfeeding initiation rate in PCTs was 65.5% in 2005–2006 (SD 13.0)

and 72.4% in 2012–13 (SD 11.1). For any breastfeeding at 6–8 weeks, the average PCT rate was 41.2% in 2008–2009 (SD 14.1) and 43.7% in 2012–13 (SD 13.6). Figure 1 displays the average initiation and prevalence reported by the DH using this dataset, compared with the nearest equivalent measure in successive infant feeding surveys.

Breastfeeding initiation

One hundred and forty-nine PCTs were included in the analysis of breastfeeding initiation time trends. Two PCTs did not meet the inclusion criteria because they only reported data at three and four time points, respectively, out of a possible eight data points.

Breastfeeding initiation rose on average 0.9% per year between 2005–2006 and 2012–2013 (RR 1.01,

Fig. 1. Breastfeeding initiation and prevalence: comparison of IFS¹ and DH data. ¹IFS data for 2005 and 2010 refers to England only; data from previous years combines England and Wales.

95% 1.01 to 1.02). The increase in initiation was steepest during earlier years (2005–2006 to 2007–2008), with a lower average annual increase (0.5%) when only the years 2008–2009 to 2012–2013 were considered (equivalent time period to analysis of breastfeeding prevalence at 6–8 weeks).

There was a large difference in trend by stratifying variables, confirmed by statistically significant interactions between year and all explanatory variables except BME.

In 2005–2006, breastfeeding initiation was considerably lower in the most deprived PCTs, those with the lowest proportion of the population from a BME background, and PCTs with the highest proportions of young mothers and maternal smoking (Table 1). However, increases in breastfeeding initiation over the time period were significantly higher in PCTs with these area characteristics except BME profile. The most deprived PCTs saw a 1.2% increase each year compared with 0.7% in the least deprived PCTs (Fig. 2). On average, PCTs with the lowest initiation rates in 2005–2006 saw a 1.4% increase in initiation each year, compared with 0.6% in PCTs with the highest baseline initiation (Fig. 3). Similar trends were observed for PCTs with higher proportions of young mothers and maternal smoking, with breastfeeding initiation increasing at a higher rate compared with the reference group of PCTs.

Breastfeeding prevalence at 6–8 weeks

One hundred and twenty-nine PCTs were included in the analysis of 6–8-week time trends. Twenty-two PCTs did not meet the inclusion criteria: 13 had missing data for 3 years, seven PCTs had missing data for 4 years, and two PCTs did not report any acceptable data for the 5 years under study.

There was a small increase in breastfeeding prevalence over the 5 years of data, equivalent to an annual increase of 0.7% per year across all PCTs (RR 1.02, 95% CI 1.01–1.03).

In 2008–2009, breastfeeding prevalence at 6–8 weeks showed similar trends to those observed in breastfeeding initiation: area deprivation, a small BME population, higher proportions of young mothers and higher maternal smoking were all

correlated with lower area-based breastfeeding rates (Table 2).

The small observed increase in breastfeeding at 6–8 weeks appeared consistent across most PCTs with no strong evidence of variation by area profile. The one exception to this was that PCTs with the lowest breastfeeding prevalence at 6–8 weeks in 2008–2009 saw an average annual increase of 0.8% (RR 1.03, 95% CI 1.01 to 1.05), compared with just 0.07% (RR 1.00, 95% CI 0.99 to 1.02) among PCTs with the highest breastfeeding prevalence in 2008–2009 (Fig. 4).

Discussion

Both breastfeeding initiation and breastfeeding prevalence at 6–8 weeks have increased in England over the years for which good quality routine area-based data are available (Fig. 1). However, these broad trends obscure evidence that breastfeeding initiation has risen more steeply in PCTs with a more disadvantaged profile and those with lower initial breastfeeding rates. Increases over time in breastfeeding prevalence at 6–8 weeks have been more consistent across PCTs, although PCTs with historically low breastfeeding prevalence at 6–8 weeks witnessed the largest increases in the 6–8-week breastfeeding prevalence. Despite the general increases over time, there is some evidence that increases have levelled off with little or no change in both initiation and prevalence rates between 2010–2011 and 2012–2013.

The new millennium has seen extensive policies designed to address the legacy of low breastfeeding rates in England, including NICE guidance (National Institute for Health and Clinical Excellence 2008), investment in the UNICEF Baby Friendly Initiative with earmarked funding for PCTs with low breastfeeding (Department of Health 2008), targets for increasing breastfeeding (Department of Health 2003), and the introduction of local monitoring of breastfeeding trends (Department of Health 2012b). The findings of our study suggest that these initiatives or local interventions may have had some success in tackling inequalities, although it was not possible to take account of this in the analysis; causality cannot

Table 1. Breastfeeding initiation in 2005–2006 and 2012–2013 and average annual change, by stratifying variables

	Breastfeeding initiation			Breastfeeding initiation			Effect of year	P-value for interaction [‡]	Average annual relative change	Average annual absolute change [§]	
	2005–2006			2012–2013							
	Mean % (SD)	Min, max		Mean % (SD)	Min, max						
ALL PCTs (<i>n</i> = 149)	65.5 (13.0)	30.3, 92.9		72.4 (11.1)	40.8, 94.7		1.01 (1.01–1.02)	<0.001	–	1.42%	0.93%
IMD											
Low (least deprived)	72.1 (8.6)	56.4, 92.9		76.7 (5.8)	67.8, 90.5		1.01 (1.01–1.01)	<0.001	ref	0.93%	0.67%
Middle	66.6 (11.5)	45.1, 89.5		72.4 (10.4)	53.9, 92.1		1.01 (1.01–1.02)	<0.001	0.13	1.36%	0.90%
High (most deprived)	58.6 (14.4)	30.3, 89.7		68.4 (13.8)	40.8, 94.7		1.02 (1.02–1.03)	<0.001	<0.001	2.12%	1.24%
BF initiation 2005–2006											
Low	50.7 (6.8)	30.3, 59.3		60.5 (8.4)	40.8, 83.4		1.03 (1.02–1.03)	<0.001	ref	2.85%	1.45%
Middle	66.8 (4.0)	59.4, 72.3		71.9 (4.5)	62.1, 79.8		1.01 (1.01–1.01)	<0.001	<0.001	1.19%	0.79%
High	79.3 (5.8)	72.3, 92.9		82.8 (6.7)	71.1, 94.7		1.01 (1.00–1.01)	<0.001	<0.001	0.73%	0.58%
Missing	–	–		76.2 (9.5)	59.7, 91.5		1.01 (1.01–1.02)	<0.001			
BME											
Low	59.8 (12.5)	30.3, 81.0		65.9 (9.9)	40.8, 81.4						
Middle	79.51 (10.7)	42.7, 79.5		70.5 (8.2)	46.4, 83.9						
High	72.9 (12.4)	46.0, 92.9		80.5 (9.6)	61.2, 94.7						
Young mothers											
Low	76.8 (9.2)	53.7, 92.9		83.1 (6.9)	71.1, 94.7		1.01 (1.01–1.02)	<0.001	ref	1.21%	0.93%
Middle	64.7 (10.4)	30.3, 79.5		71.2 (7.9)	40.8, 86.0		1.01 (1.01–1.02)	<0.001	0.75	1.29%	0.83%
High	57.1 (10.9)	38.0, 81.0		63.5 (8.2)	43.9, 79.8		1.02 (1.01–1.02)	<0.001	0.02	1.90%	1.08%
Smoking											
Low	77.6 (8.3)	53.7, 92.9		83.0 (7.0)	68.3, 94.7		1.01 (1.01–1.01)	<0.001	ref	0.99%	0.77%
Middle	63.7 (9.1)	38.9, 79.5		69.9 (6.9)	50.9, 81.5		1.01 (1.01–1.02)	<0.001	0.27	1.29%	0.82%
High	56.7 (11.6)	30.3, 81.0		63.5 (9.0)	40.8, 79.1		1.02 (1.01–1.02)	<0.001	0.01	1.94%	1.10%

BF, breastfeeding; BME, black or minority ethnic; CI, confidence interval; IMD, Index of Multiple Deprivation; PCT, primary care trust. *Stratified RRs for effect of year only presented where interaction was significant. [†]P-value for RR. [‡]Null hypothesis was that change in initiation over time did not vary by stratifying variable. [§]Based on Poisson model and 'baseline' rate in 2005–2006. For example, for the least deprived PCTs, the absolute annual change was estimated to be $72.1 \times 0.0093 = 0.67\%$.

Fig. 2. Average breastfeeding initiation at the PCT level, by area deprivation (IMD).

Fig. 3. Average breastfeeding initiation at the PCT level, by baseline breastfeeding initiation in 2005-2006.

be inferred using aggregate data alone. Furthermore, aggregating data to PCT level (median number of births per PCT per year: 3823) may obscure socio-economic heterogeneity within a PCT. A report using data from Scotland suggested that during the first decade of the millennium, breastfeeding increased at a faster rate in the most deprived areas, though there was some suggestion that this was in part caused by

changes in the composition of the population such as an increase in the proportion of mothers born outside the UK (Ajetunmobi & Whyte 2012).

As part of our analysis, we compared the DH breastfeeding data to figures collected by the recent IFS (Fig. 1), and from this comparison, it is clear that DH data systematically reports lower breastfeeding than IFS data. This discrepancy is likely to be partly

Table 2. Breastfeeding prevalence at 6–8 weeks in 2008–2009 and 2012–2013 and average annual change, by stratifying variables

	Any breastfeeding at 6–8 weeks		Any breastfeeding at 6–8 weeks		Effect of year		P-value for interaction [‡]	Average annual relative change	Average annual absolute change [§]
	2008–2009		2012–2013		Risk ratio* (95% CI)				
	Mean % (SD)	Min, max	Mean % (SD)	Min, max		P-value [†]			
All PCTs (<i>n</i> = 129)	41.2 (14.1)	13.4, 76.6	43.7 (13.6)	17.5, 83.3	1.02 (1.01–1.03)	0.005	–	1.74%	0.72%
IMD									
Low (least deprived)	47.4 (11.9)	29.8, 76.6	49.6 (8.4)	36.7, 74.2					
Middle	40.1 (12.0)	15.5, 75.4	43.0 (12.8)	24.6, 73.1					
High (most deprived)	34.7 (17.2)	13.4, 73.3	39.2 (16.4)	17.5, 83.3					
BF prevalence 2008–2009									
Low	27.5 (6.7)	13.4, 34.7	31.3 (6.5)	17.5, 41.6	1.03 (1.01–1.05)	0.000	ref	2.98%	0.82%
Middle	40.5 (2.7)	35.0, 45.4	43.1 (4.2)	35.1, 50.7	1.02 (1.01–1.03)	0.005	0.25	1.76%	0.71%
High	57.1 (10.2)	45.6, 76.6	56.6 (10.6)	39.7, 73.5	1.00 (0.99–1.02)	0.866	0.01	0.12%	0.07%
Missing	–	–	44.2 (14.8)	21.9, 83.3	1.01 (0.99–1.03)	0.236	0.90	–	–
BME									
Low	34.0 (10.4)	13.4, 55.6	35.5 (9.1)	17.5, 52.0					
Middle	42.0 (10.1)	19.0, 64.0	43.7 (8.7)	23.8, 59.8					
High	55.1 (15.0)	32.5, 76.6	57.0 (15.5)	30.5, 83.3					
Young mothers									
Low	59.4 (12.1)	40.7, 76.6	59.9 (12.2)	36.7, 83.3					
Middle	42.4 (8.9)	13.4, 57.4	43.3 (8.5)	17.5, 67.9					
High	31.5 (8.1)	15.5, 48.3	34.0 (7.7)	19.4, 51.4					
Smoking									
Low	55.7 (12.1)	38.3, 76.6	59.1 (12.1)	39.4, 83.3					
Middle	38.7 (5.8)	28.0, 47.2	41.6 (7.2)	27.5, 56.0					
High	32.3 (10.1)	13.4, 55.6	34.2 (8.5)	17.5, 52.0					

BF, breastfeeding; BME, black or minority ethnic; CI, confidence interval; IMD, Index of Multiple Deprivation; PCT, primary care trust. *Stratified RRs for effect of year only presented where interaction was significant. [‡]P-value for RR. [§]Null hypothesis was that change in prevalence over time did not vary by stratifying variable. [§]Based on Poisson model and rate in 2008–2009. For example, PCTs with low baseline prevalence, the absolute annual change was estimated to be $27.5 \times 0.0298 = 0.82\%$.

Fig. 4. Average breastfeeding prevalence (6-8 weeks) at the PCT level, by baseline breastfeeding prevalence in 2008-2009.

attributable to the DH assumption that missing data are equivalent to no breastfeeding. DH data define initiation as occurring within 48 h of delivery, whereas IFS place no time limit on initiation; however, the number of mothers who initiate breastfeeding after the first 48 h is likely to be minimal and unlikely to explain the difference between the two figures. In addition, although DH prevalence data should ideally be collected between 6 and 8 weeks, IFS data are likely to correspond more closely to the 6-week time point resulting in higher prevalence estimates compared with DH data. However, it is also possible that IFS data is an overestimate: the response rate to the 2010 stage 1 survey was 51% (down from 72% in 2000) and although attempts are made to minimise any effect of bias caused by low and differential response (e.g. by weighting for non-response), it is difficult to remove such bias completely.

Prompt access to local data on infant feeding is essential for those involved in commissioning and delivering services. A recent study in Scotland has highlighted the potential for using linked data to monitor infant feeding patterns at the individual level (Ajetunmobi *et al.* 2014), though it is not clear whether a similar approach could be utilised in England. This analysis was conducted at PCT level: PCTs were abolished in 2013 and their main functions

replaced by Clinical Commissioning Groups (CCG). Collection of local breastfeeding data has continued from 2013 to 2014 quarter 3 and is now reported at CCG level. In many cases, the geographical boundaries covered by CCGs are similar to PCTs, allowing similar area-based analyses of breastfeeding trends to be conducted in the future. However, in order for this to be possible, it is imperative that local breastfeeding data continue to be collected with the same level of quality. The first round of data released for 2013-2014 suggest that the new data collection system has been accompanied by a decline in data quality.

Breastfeeding is both a cause and consequence of social inequalities in the UK (Renfrew *et al.* 2012) and is considered a key indicator for health improvement in England (Department of Health 2012a). A reduction in socio-demographic disparities in breastfeeding is likely to translate to better health outcomes and cost savings: a recent report estimated that a moderate increase in breastfeeding in the UK could save over £17 million per year by reducing the cost of acute infant disease alone (Renfrew *et al.* 2012). There has been a renewed focus on health inequalities more generally over recent years, exemplified by the publication of the Marmot Review *Fair Society, Healthy Lives* (Marmot *et al.* 2010). However, tackling health inequalities in the UK has

proved to be challenging. A report published in 2012 suggested that 2 years after the launch of the Marmot Review, inequalities in life expectancy – one of the most important indicators of health – had increased rather than decreased in many local authority areas (The London Health Observatory and UCL Institute of Health Equity 2012). In contrast, the findings from our study provide some evidence that area-based socio-demographic inequalities in breastfeeding have lessened over recent years, particularly in terms of breastfeeding initiation. However, the failure to sustain these increases over the last 2–3 years is cause for concern. There is still a paucity of evidence about what works in improving breastfeeding rates: evaluations of breastfeeding support interventions in the UK have tended to show limited effectiveness (Hoddinott *et al.* 2011). In recent years, there has been increasing interest in the role of social environment and self-efficacy in breastfeeding behaviour (McFadden & Toole 2006; Entwistle *et al.* 2010), suggesting the need for multifaceted interventions, which address the social and cultural context of breastfeeding.

To our knowledge, no previous studies have investigated inequalities in breastfeeding time trends in England. The UK is exceptional in collecting good quality and long-term data on breastfeeding; however, several studies have used individual-level data to explore trends in other high-income countries and these have reported conflicting findings. A comparison of two surveys conducted in France (1998 and 2003) found that although overall breastfeeding rates increased between the surveys, time trends were similar in all social groups suggesting no impact on social disparities in breastfeeding (Bonet *et al.* 2007). An analysis of National Health Survey data in Australia observed little change in breastfeeding initiation or continuation between 1995 and 2004–2005, with evidence that the gap in breastfeeding between the most disadvantaged and least disadvantaged mothers had actually increased during the same period (Amir & Donath 2008). Survey data from the United States and Canada have both showed that social disparities in breastfeeding have improved slightly over the last two decades (Ryan *et al.* 2002; Gilbert *et al.* 2014).

Recent DH data suggest that overall increases in breastfeeding initiation and prevalence in 6–8 weeks have levelled off since 2011. This worrying trend has been highlighted in a recent report (Lemer, 2013). Breastfeeding continues to be a priority for public health and it is imperative to sustain increases particularly among more disadvantaged mothers. Implementation of effective and consistent support for all women to continue to breastfeed is important to enable women to breastfeed for as long as they wish.

Conclusion

The findings reported here suggest that there has been a narrowing in the deprivation gap in terms of breastfeeding initiation over the last 8 years. However, the data also suggest that increases in both breastfeeding initiation and prevalence at 6–8 weeks have stagnated since 2011. Given the importance of breastfeeding in addressing health inequalities, sustained efforts need to be made to promote breastfeeding and to support breastfeeding women, particularly to increase continuation rates among women living in more disadvantaged communities. Continuing to collect and analyse high-quality area-level data is fundamental to plan and monitor effective infant feeding policies.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Contributions

MQ and LO conceived the study and all authors contributed to the design of the study. MQ and LO designed and conducted the analysis. All authors were involved in the interpretation of the data. LO wrote the initial draft of the manuscript, and all authors contributed to revising consecutive drafts. All authors approved the final version of the manuscript.

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