

<b>Institution:</b> Brunel University London		
<b>Unit of Assessment:</b> 3 Allied Health Professions, Dentistry, Nursing and Pharmacy		
<b>Title of case study:</b> Informing policies and debates on breastfeeding promotion		
<b>Period when the underpinning research was undertaken:</b> 3/2010 – 2018		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
1) Subhash Pokhrel	1) Professor	1) 08/2005 – present
2) Julia Fox-Rushby	2) Professor	2) 12/2004 – 08/2017
3) Nana Anokye	3) Reader	3) 09/2006 – present
4) Paul Trueman	4) Professor	4) 01/2010 – 05/2011
<b>Period when the claimed impact occurred:</b> 8/2013 – 12/2020		
<b>Is this case study continued from a case study submitted in 2014?</b> No.		

### 1. Summary of the impact (indicative maximum 100 words)

Low breastfeeding rates were a concern in the UK, with over 700,000 annual births, and globally. A UNICEF-funded team estimated the health benefits for babies and mothers from a given expansion of breastfeeding. Brunel members of the team contributed, in particular, novel analysis that calculated potential cost savings from the expected consequent reduced demand on the NHS. The findings had wide-reaching impacts. They informed and improved the quality of debates, policies, strategies and guidelines from: governments and health bodies (in Australia, Ireland, and the UK); multinational organisations including WHO (especially in the context of achieving SDGs); and professional bodies (for Italian paediatricians and New Zealand midwives). These promoted increases in breastfeeding in order to improve health. The economic analysis provided additional quantified justifications for promoting breastfeeding, and it also informed debates and policies around strategies that might be financially justifiable to boost breastfeeding, including for low-income mothers to also increase health equity.

### 2. Underpinning research (indicative maximum 500 words)

Reflecting long-standing global concerns about sub-optimal breastfeeding rates, UNICEF UK were concerned about the UK's comparatively low rates of breastfeeding. In 2009, over 790,000 babies were born in the UK, and while over 80% of mothers started breastfeeding, by four months only about 10% were exclusively breastfeeding. Crucially, most of those who stopped breastfeeding did so earlier than they wished. UNICEF UK thought the strong evidence of the health risks associated with not breastfeeding to the optimum extent made this a major health issue that required investment, and an organised and informed response.

There was an underlying policy assumption that increasing the prevalence of breastfeeding would translate into significant cost savings for the health system. However, there was a lack of rigorous research relating to the UK. UNICEF, therefore, commissioned the study (from March 2010 to October 2011) to understand the potential contribution that increasing breastfeeding rates would make to preventing disease and saving resources. Pokhrel, Fox-Rushby and Trueman from Brunel conducted the economic analysis on the project led by Mary Renfrew, originally from the University of York, and subsequently from the University of Dundee. There was also one team member from each of the University of Oxford, the NCT (formally National Childbirth Trust), and St George's.

The economic analysis focused on calculating the potential NHS cost savings from reducing diseases where there was the strongest evidence of health benefits attributable to increases in breastfeeding rates. Five priority diseases - four acute diseases in infants and breast cancer in women - were identified through an extensive systematic process. High-quality systematic

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reviews and UK studies including sufficient data to allow economic analysis were identified and examined.

For the economic modelling, Brunel developed a novel seven-step framework. The study found that treating the four acute diseases in children cost the UK at least GBP89,000,000 annually. The 2009–2010 value of lifetime costs of treating maternal breast cancer was estimated at GBP959,000,000. Supporting mothers who were exclusively breastfeeding at one week to continue breast feeding until four months would be expected to reduce the incidence of the childhood infectious diseases and save at least GBP11,000,000 annually, with a further GBP6,000,000 from increased breastfeeding on discharge of babies who had been in neonatal units. Doubling the proportion of mothers breastfeeding for 7–18 months in their lifetime would probably reduce the incidence of maternal breast cancer and save at least GBP31,000,000, at 2009–2010 value.

The study concluded that the economic impact of low breastfeeding rates was substantial. And, therefore, investing in services that supported women who wanted to breastfeed for longer was potentially cost saving. In addition to the full economic modelling for the five conditions, the study also provided narrative analyses of outcomes for three conditions where limitations of the evidence base meant that the scale of the economic impact was difficult to measure with precision. The potential gains in terms of economic productivity, however, were large, and further aspects of the economic benefits from breastfeeding were noted. The full findings were presented in a peer-reviewed report published by UNICEF UK (Renfrew, Pokhrel et al, 2012) **[Research (R)1]**. An article by Pokhrel et al (2015) in *Arch Dis Child* focused on the cost savings from the five conditions **[R2]**.

Partly building on the UNICEF study, Brunel staff then collaborated on the Nourishing Start for Health (NoSH) randomised control trial (RCT). NoSH tested use of financial vouchers to achieve the increased duration of breastfeeding that the UNICEF study had shown would lead to reduced illness and to cost-savings. NoSH, published in *JAMA Pediatrics* **[R3]**, showed financial incentives may improve breastfeeding rates in areas with low baseline prevalence. Offering a financial incentive to women in areas of England with breastfeeding rates below 40% resulted, compared with usual care, in a modest but statistically significant increase in breastfeeding prevalence. As part of the NoSH study Anokye, Fox-Rushby, and research assistant Kathryn Coyle, led on the first ever cost-effectiveness estimate of offering breast-feeding financial incentives **[R4]**. This novel new paper shows such programmes can increase breastfeeding and provide value for money.

### 3. References to the research (indicative maximum of six references)

**R1:** Renfrew MJ, Pokhrel S, Quigley M, McCormick F, Fox-Rushby J, Dodds R, Duffy S, Trueman P, Williams A. *Preventing disease and saving resources: the potential contribution of increasing breastfeeding rates in the UK*. UK: Unicef; 2012. [Preventing disease and saving resources: the potential contribution of increasing breastfeeding rates in the UK \(unicef.org.uk\)](http://unicef.org.uk/preventing-disease-and-saving-resources-the-potential-contribution-of-increasing-breastfeeding-rates-in-the-uk) (**R1 & R2** from: Unicef grant: GBP250,000)

**R2:** Pokhrel S, Quigley MA, Fox-Rushby J, McCormick F, Williams A, Trueman P, Dodds R, Renfrew MJ. Potential economic impacts from improving breastfeeding rates in the UK. *Arch Dis Child*. 2015;100:334–40. doi:10.1136/archdischild-2014-306701

**R3:** Relton C, Strong M, ....Fox-Rushby J, Anokye N, Umney D, Renfrew MJ. Effect of financial incentives on breastfeeding a cluster randomized clinical trial. *JAMA Pediatr*. 2018; 172(2):e174523. doi:10.1001/jamapediatrics.2017.4523 (**R3 & R4** from: MRC-funded trial via the National Prevention Research Initiative. GBP1,253,013; 01/2012 – 12/2017).

**R4:** Anokye N, Coyle K, Relton C, Walters S, Strong M, Fox-Rushby J. Cost-effectiveness of offering an area-level financial incentive on breast feeding: a within-cluster randomised controlled trial analysis. *Arch Dis Child*. 2020;105:155-9. doi:10.1136/archdischild-2018-316741

### 4. Details of the impact (indicative maximum 750 words)

The research teams, UNICEF, and the publishing journals all disseminated the stream of

research evidence about the benefits of breastfeeding extensively. It made an impact not only on, but also through, the advocacy activities and policies of the diverse organisations promoting breastfeeding, including ones linked to the research. This was **Impact 1**, which, despite the research's UK focus, was significantly wide-reaching, covering governments, professional bodies, advocacy groups and other organisations in many countries as well as multinational organisations. The advocacy, guidelines and policies have directly promoted an increase in the levels of breastfeeding in order to generate health gains, and cited the research as a major reason for doing so. In this, the identified cost savings were often highlighted as a key justification for investing in efforts to boost breastfeeding. Overlapping with this, **Impact 2** was informing discussions as policymakers considered which specific strategies were financially justifiable to boost breastfeeding in order to improve health and equity. The research provided an evidential background that improved the quality of debates. **Impact 3** was informing debates on regulatory policies where breastfeeding campaigners aimed to ensure it had a level playing field with commercial breast-milk substitutes.

Beneficiaries of this research include: policymakers, practitioners and campaigners who promoted breastfeeding, and were provided with a stronger evidence base for their activities; relevant mothers and children whose health might be better than it otherwise would have been; and healthcare services that might have lower costs than they otherwise might have had.

### **Impact 1: informing/strengthening advocacy and policies promoting breastfeeding**

The Brunel team participated in the extensive dissemination of the findings, including to the local (ie, Hillingdon) healthcare system, and nationally and internationally. Pokhrel et al's paper **[R2]** was reported in the *Nursing Times*, the *Mail Online* and other outlets. Networking by Brunel resulted in coverage of the paper on the website of the WHO's Global Partnership for Maternal, Newborn & Child Health. Also, Reuters and the BBC interviewed Pokhrel and quoted him in their web stories. The BBC News story in December 2014 also illustrates how the study was used by advocacy groups: a co-author from the NCT, which promoted the findings extensively, was quoted as saying there should be more support in the community for breastfeeding **[Evidence (Ev)1]**.

Within individual countries, the research has made a significant impact through providing evidence to inform debates. A Scottish Parliament debate on 12 June 2014 was led by Elaine Smith who called the debate partly to promote **R1**. The motion debated included a call for the Parliament to note that the UNICEF report "*outlined how increased breastfeeding rates could improve public health, produce long-term health benefits, allow considerable savings to be made by the NHS and provide a mechanism for improving health outcomes across a range of social groups*" (p.2) **[Ev2]**. Smith first mentioned the research in her opening words: "*I am pleased to be able to lead a debate today on the important issue of breastfeeding...low breastfeeding rates cost money and lives, as is proved in the UNICEF UK-commissioned report*" (p.3). Later she continued: "*The UNICEF UK-commissioned report not only tells us that low breastfeeding rates lead to increased incidence of illness, with a significant cost to the national health service, but supports that fact with hard figures—probably for the first time—showing that moderate increases in breastfeeding translate into huge cost savings*" (p.6/8). She also called for the Minister to meet the report's authors **[Ev2]**.

National policies in England informed by the research included the 2014 the National Institute for Health and Clinical Excellence (NICE) Local Government Briefing [LGB] 22: *Health Visiting*. It used **R1** as the third of four points in the section on costs and savings introduced by the statement: "*Effectively using health visiting to improve the health and wellbeing of children aged 0–5 can lead to the following costs and savings*" **[Ev3]**. In 2016, Public Health England (PHE) cited **R1** in parts of its guidance document prepared in conjunction with the UNICEF UK Baby Friendly Initiative: *Commissioning infant feeding services: a toolkit for local authorities (Part 2)* **[Ev4]**. The introduction used **R1** to support a statement starting: "*Commissioning services to increase and sustain breastfeeding would deliver significant cost savings to the NHS and to the local authority*" (p.8).

Around the UK, NHS trusts and local authorities cited the research in documents promoting breastfeeding. Examples included Great Ormond Street and also Hillingdon - the opening sentence of the combined local government and health authorities' strategy, *The Hillingdon*

*Infant Feeding Policy*, 2014, said: “Hillingdon believes that breastfeeding is the healthiest way for a woman to feed her baby and recognises the important health and well-being benefits now known to exist for both the mother and the child. (Renfrew 2012, Public Health Outcomes 2013)” (p.5) [Ev5].

Policy documents from WHO and UNICEF, such as their 2015, *Breastfeeding Advocacy Initiative for the best start in life*, stated that increased rates of breastfeeding would help achieve various SDGs. In calling for action, it was claimed that globally over 800,000 children died in 2011 because infants did not receive the health improvements associated with increased breastfeeding. The strategy was supported by many organisations including the Bill & Melinda Gates Foundation, Save the Children and the World Alliance for Breastfeeding Action. Under the heading “*Not breastfeeding has economic costs*”, it cited R1 to support the statement: “*Breastfeeding can save health care systems significant resources due to reduced illness among breastfed babies—even moderate increases in breastfeeding in the UK could save the health service millions of pounds annually*” (p.7/8) [Ev6]. Similarly, WHO Europe’s 2016 document, *Good Maternal Nutrition, the best start in life*, highlighted the importance of achieving the SDGs, and used R2 as the only reference to support a suggestion to policy-advisers that “*Cost savings achieved by improved services should be demonstrated, and the expected benefits quantified. The available evidence should be used, and adapted according to the experiences of other Member States*” (Para 11.2) [Ev7].

International examples of the research informing government health service policies include the *Breastfeeding Action Plan 2016-21* from the Health Service Executive in Ireland. It cites R1, including once as one of two references for the statement: “*International studies have outlined the significant cost savings to the health service to be achieved through even gradual increases in breastfeeding rates*” (p.6) [Ev8]. Under the heading: “*Breastfeeding reduces health costs*”, the *Australian National Breastfeeding Strategy 2019 and Beyond*, states “*A UNICEF UK report authored by Renfrew and colleagues found that even modest increases in breastfeeding rates in the UK were associated with substantial economic and health benefits*” (p.23) [Ev9]. Statements advocating breastfeeding from professional bodies citing R2 as important evidence, included the *Position Statement on Breastfeeding from the Italian Pediatric Societies*, 2015 [Ev10] and the New Zealand College of Midwives consensus statement, *Breastfeeding* (updated July 2016) [Ev11].

### **Impact 2: informing specific strategies supporting breastfeeding for better health and equity**

The pathways to impact here again involved both the research team and key stakeholders, in this case promoting use of the findings to inform specific strategies for increasing breastfeeding for better health (and equity). The Director of NICE wrote in the Forward to the UNICEF report [R1]: “*This is an important report in several ways. It is important scientifically – the methods used are at once rigorous and novel. It is important practically – it shows what can be done to make matters better. And it is important for policy – it shows in stark relief what the nature of the problem is but also presents the potential solutions.*” In the continuing dissemination, Pokhrel, for example, drew on the research to present an invited business case for breastfeeding promotion in 2019 at the 14<sup>th</sup> International Breastfeeding and Lactation Symposium in London. Online publication of R4 in 2019 led to vigorous debate on TV and in the papers, including a story in the *Daily Telegraph* on 18 Sept in which Anokye was quoted: “*We’ve shown that a financial incentives programme such as this can not only increase rates of breastfeeding, but also provide good value for money.*”

In 2018, the breastfeeding section of PHE guidance entitled, *Best start in life: cost-effective commissioning*, drew on the UNICEF research. This guidance aimed to help local commissioners provide cost-effective interventions for children aged up to five and pregnant women. Part of the detailed analysis of interventions to promote breastfeeding was drawn from three sources: one each from R1 and another report, but R2 provided “*All other parameters*” (p.35) [Ev12].

Even before this detailed advice, local commissioning groups, covering local authorities and NHS trusts, used the research to inform their specific strategies. For example, of the five



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references in *St Helens Infant Feeding Strategy 2016-19* one was the PHE advice from 2016 [Ev4] another was R1. The start of the strategy's Executive Summary highlighted the importance of breastfeeding to improving both health and health equity: "*Breastfeeding provides both short and long-term health, educational and social benefits for babies, mothers and reduces inequalities*" (p.2). In addition to describing the UNICEF study it took figures from R1 on potential gains in economic productivity and applied them to St Helens (p.5) [Ev13]. In 2016, Manchester's multi-agency Joint Strategic Needs Assessment panel's statement on breastfeeding was framed by R1 which, it stated in the second sentence, "*demonstrates that investing in effective services to increase and sustain breastfeeding would make a significant contribution to reducing health inequalities*" [Ev14].

The more recent economic analysis of financial incentives as a specific intervention is also beginning to inform policy and public debate. It was referred to as a study underway in the debate in the Scottish Parliament (29) [Ev2]. A 2018 pre-budget submission to the Australian government described the findings of the NoSH RCT [R3] and continued: "*It is likely to be particularly relevant to approaches to increasing breastfeeding among mothers in low income or urban indigenous families in Australia, for whom breastfeeding rates are considerably lower than in the general population of mothers. Such financial rewards could also be attractive to some disempowered mothers with little or no independent sources of income even when household income is adequate*" (p.14) [Ev16]. An opening call in the submission was for "*a funded package of measures to align fiscal incentives with public health goals of supporting optimal infant and young child feeding particularly breastfeeding*" (p.2). It also drew on R1 and R2 in later analysis.

### **Impact 3: providing evidence on the benefits from breastfeeding for regulatory debates**

The research findings were also used by organisations supporting breastfeeding in debates about regulatory policies. In their submissions they attempted to ensure there was a level playing field for breast-milk, and appropriate regulation of breast-milk substitutes. For example, in a 2015 submission to Commerce Commission New Zealand, related to the need for "*the regulation of all breast-milk substitutes*", the New Zealand College of Midwives claimed: "*Breastfeeding is economically beneficial in regards to population health*" (p.1) [Ev15]. It later devoted a whole paragraph (1.6) to the findings of R2, and a further one (3.3) to discussing key points from R1.

## **5. Sources to corroborate the impact** (indicative maximum of 10 references)

*PDFs submitted for all evidence.*

**Ev1:** BBC News, 5 Dec 2014: *More breastfeeding 'could save NHS millions*; promotion of R2 by Pokhrel and Rosemary Dodds from NCT [Impact (Imp) 1 & 2]

**Ev2:** Scottish Parliament, 12 June 2014: Breastfeeding debate [Imp 1 & 2]

**Ev3:** NICE Local Government Briefing [LGB22], Sept 2014: *Health Visiting - cost saving section* [Imp1]

**Ev4:** PHE, 2016: *Commissioning infant feeding services: a toolkit for local authorities (Part 2)* [Imp1]

**Ev5:** Hillingdon, Aug 2014: *The Hillingdon Infant Feeding Policy* [Imp1]

**Ev6:** WHO & UNICEF, 2015: *Breastfeeding Advocacy Initiative* [Imp1]

**Ev7:** WHO Europe, 2016: *Good Maternal Nutrition, the best start in life* [Imp1]

**Ev8:** Irish Health Service Executive, 2016: *Breastfeeding in a Healthy Ireland - Breastfeeding Action Plan 2016-21* [Imp1]

**Ev9:** Australia, 2019: *Australian National Breastfeeding Strategy 2019 and beyond*; [Imp1]

**Ev10:** Italian Pediatric Societies, 2015: *Position Statement on Breastfeeding* [Imp1]

**Ev11:** New Zealand College of Midwives Consensus Statement, 2016: *Breastfeeding* [Imp1]

**Ev12:** PHE, 2018: *Cost-effectiveness and Return on Investment (ROI) of interventions associated with the Best Start in Life* [Imp2]

**Ev13:** St Helens, 2016: *St Helens Infant Feeding Strategy 2016-19* [Imp2]

**Ev14:** Manchester's Joint Strategic Needs Assessment panel, 2016: *Breastfeeding*; pdf [Imp2]

**Ev15:** Australian pre-budget submission – Julia Smith, 2018 [Imp2]

**Ev16:** New Zealand College of Midwives, 2015: *submission to the Commerce Commission New Zealand*; used R1 & 2 in a debate on regulation of breast-milk substitutes [Imp 3]