Northern Ireland Assembly

Queen's University Belfast

The Open University

Ulster University

Knowledge Exchange Seminar Series (KESS)

...is a forum that encourages debate on a wide range of research findings, with the overall aim of promoting evidence-based policy and law-making within Northern Ireland

Breastfeeding Promotion as an Economic Investment

Dr Mark McGovern
(Queen's University Belfast)

Dr Giampiero Marra
(University College London)

Dr Rosalba Radice
(Birbeck University of London)

Dr Slawa Rokicki
(University College Dublin)

Introduction

- BF promotion widely agreed to be a good public health strategy (Purdy et al 2017)
- ROI and NI in particular perform poorly, and children do not have equal opportunities to be breastfed (RCPCH 2017)
- We evaluate the direct economic returns to BF
- Intended to compliment (not substitute for) evidence on health effects

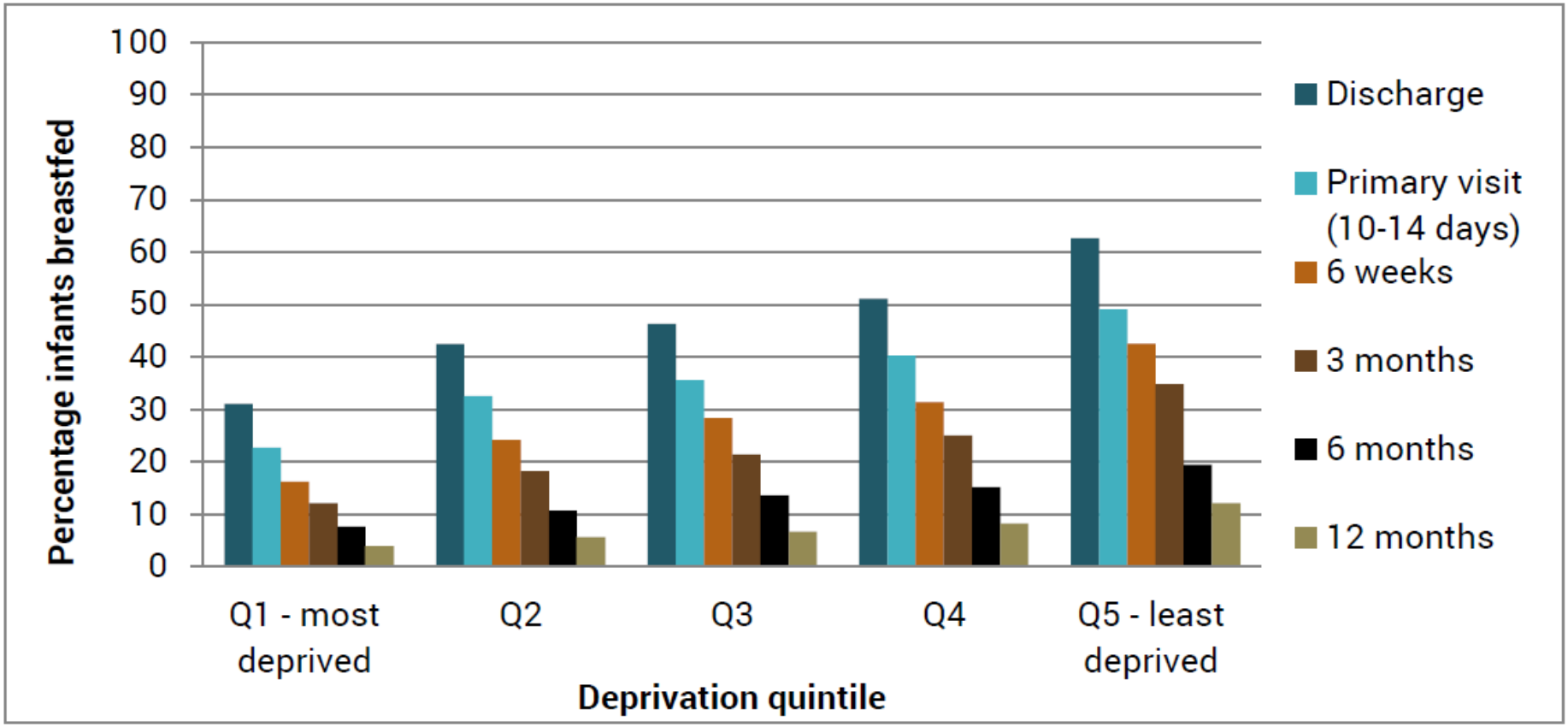
  Inform resource allocation devoted to BF programmes

  Aid decision making by providing women with information on all benefits and then fully supporting them in their choice

Breastfeeding in NI

- 46% of babies in Northern Ireland received any breastmilk on discharge from hospital, with 21% receiving some breastmilk at three months (2015/16 Northern Ireland Child Health System)
- Contrasts with 58% and 35%, respectively, in the Republic of Ireland
- At 6 months only 13% of babies were breastfed in Northern Ireland (according to the 2014/5 CHS), compared to 34% in the UK as a whole
- The corresponding figure for Norway is 71%
- WHO recommends exclusive breastfeeding for the first 6 months, and then complementary foods and continued breastfeeding up to two years and beyond
- Geographic and SES disparities: intergenerational transmission of disadvantage

Figure 7: Prevalence of any[10] breastfeeding across the first year of life by deprivation quintile (SOA) (Northern Ireland- infants born in 2014/15)



Source: Child Health System (Public Health Agency, 2017)

Breastfeeding and maternal/child health

- According to IPH (2017), breastfeeding has been found to be protective for infant health:

  Otitis media (ear infection), diarrhoea, respiratory infections, allergic rhinitis, Sudden Infant Death Syndrome, and childhood overweight.

- For women's health, support was found for a protective link between breastfeeding and:

  Breast cancer, ovarian cancer, and type 2 diabetes.

- Recent Lancet BF series found universal scale-up would prevent 823,000 child deaths and 20,000 breast cancer deaths in women (PA)

Breastfeeding and child cognition

- Experimental evidence from RCTs is the best available

- Kramer et al. (2001)

  Large-scale trial in Belarus, randomised some hospitals to BF promotion

  Large increase in exclusive BF and children had higher IQ at 6.5 years

- Isaacs et al. (2010)

  Randomised mothers of preterm infants who chose to BF but had difficulty to std formula, nutrient-rich formula, or banked breast milk

  Conducted MRI scans of participants in adolescence

  Found breast milk promotes brain development (white matter growth) in a dose-response relationship

Promotion of Breastfeeding Intervention Trial (PROBIT)

A Randomized Trial in the Republic of Belarus

See also p 463 and Patient Page.

Author Affiliations and other participating members of the PROBIT Study Group are listed at the end of this article.

Corresponding Author: Michael S. Kramer, 1020 Pine Ave W, Montreal, Quebec, Canada H3A 1A2 (e-mail: mkrame@po-box.mcgill.ca).

(Reprinted) JAMA, January 24/31, 2001—Vol 285, No. 4 413

Pediatric RESEARCH

Article

Pediatric Research (2010) **67**, 357–362; doi:10.1203/PDR.0b013e3181d026da

Impact of Breast Milk on Intelligence Quotient, Brain Size, and White Matter Development

Elizabeth B Isaacs[1], Bruce R Fischl[3,4], Brian T Quinn[3,5], Wui K Chong[6], David G Gadian[2] and Alan Lucas[1]

Previous Evidence on the Economic Effects of Breastfeeding

- Mechanisms
  - Decreases in morbidity, mortality and health care expenditures
  - Increases in human capital investment, productivity and labour supply

- Recent UNICEF UK report (2012) adopted a cost of illness approach
  - Reductions in costs associated with diseases affected by breastfeeding
  - Fewer GP consultations, hospital admissions, and treatment costs

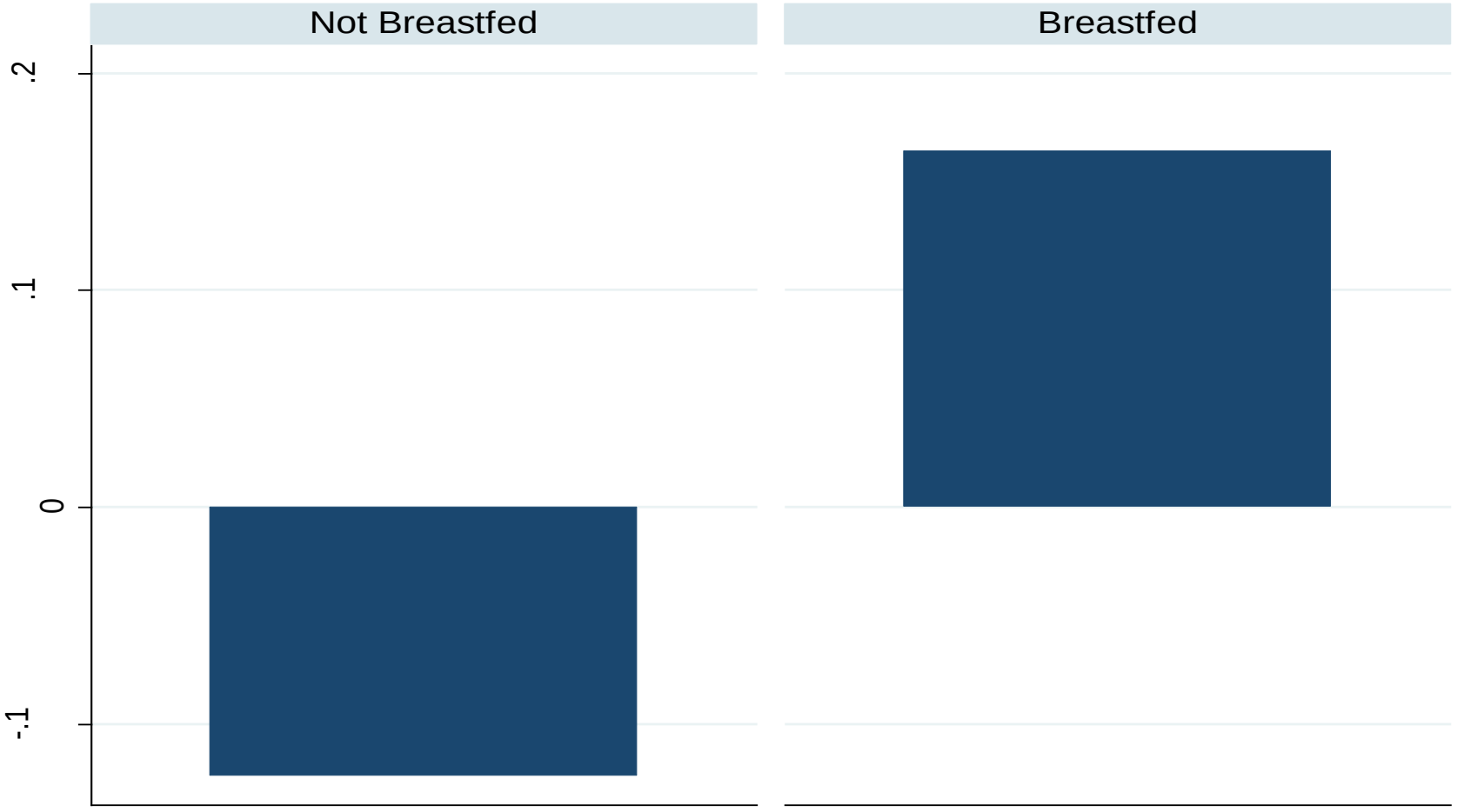
- Moderate increases in breastfeeding are expected to save £17 million per year via decreases in infant disease

- And £31 million per cohort of first-time mothers via reduction in lifetime breast cancer prevalence and associated health service costs

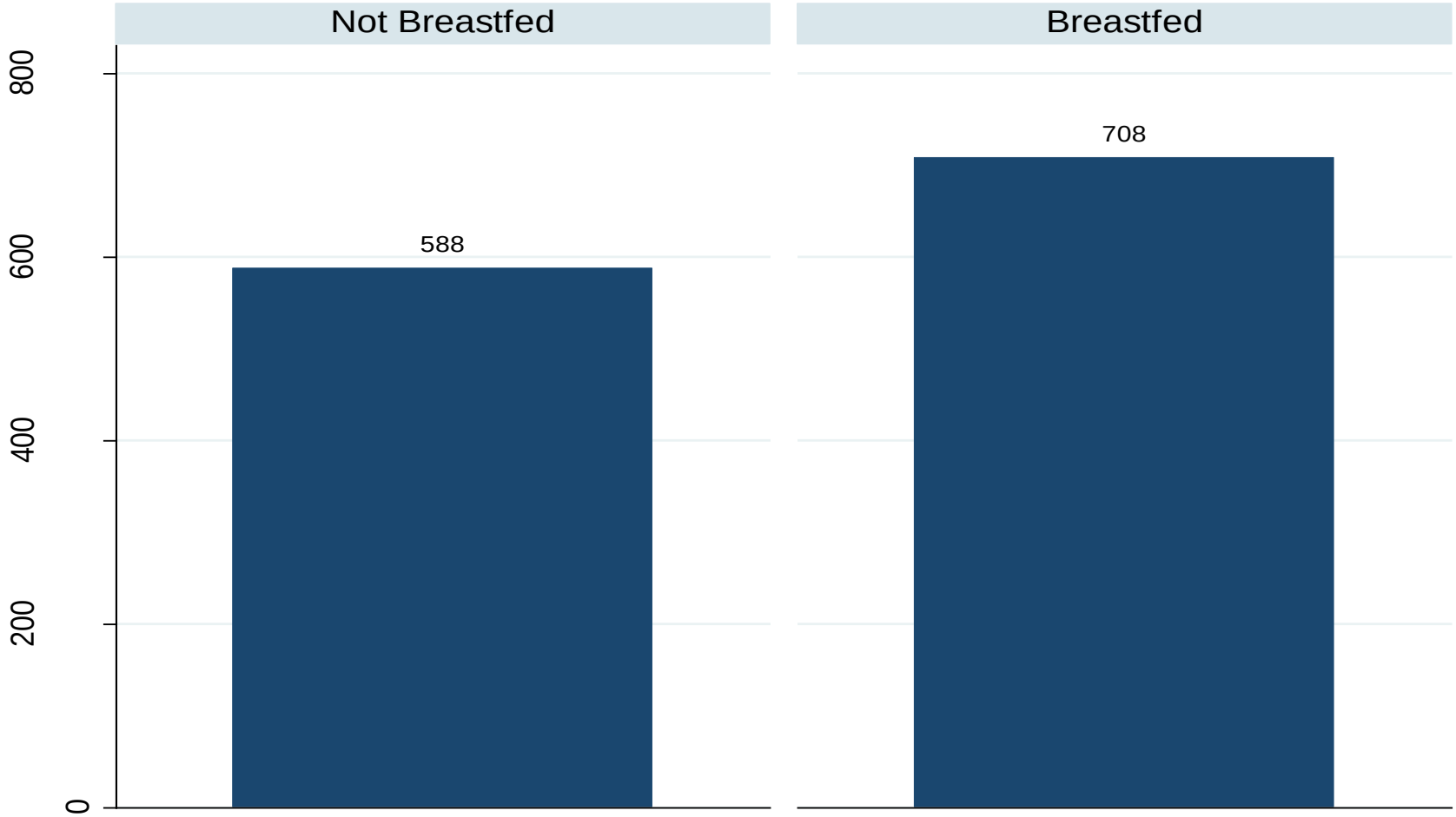
Estimating Breastfeeding Effects on Long Run Outcomes

- Cost of illness approach considers cost savings, we provide evidence on long run economic effects
- We examine the relationship between being breastfed and outcomes at age 50+ in a nationally representative cohort study
- National Child Development Study – babies born in England, Wales and Scotland in 1958. 9,000 cohort members interviewed in 2008, 43% breastfed (defined as having been breastfed for at least a month)
- Contemporaneously reported information on breastfeeding from mothers, substantial amount of background information, household income and cognitive tests
- Do those who are breastfed go on to benefit across the life cycle?

Memory Test Score age 50



Weekly Household Income Age 50



Methodology

- Can't wait for an RCT and quasi-experimental study is not feasible so how do we assess causal role in results?

  Mechanisms: Evidence on cognitive development

  Observed confounders: Impressive dataset with wide range of pre-treatment information + matching

  Unobserved confounders: SEM can be used to assess bias (McGovern et al. 2015)

Results

Outcome	Breastfeeding Effect at Age 50
Cognition: Memory (In Standard Deviation Units)	**0.15*** ** (0.07 - 0.23)
Cognition: Processing (In Standard Deviation Units)	**-0.01** (-0.08 - 0.07)
Log Household Income (In Percent)	**0.10*** ** (0.04 - 0.15)

95% Confidence Interval in Parentheses, *** p<0.01, ** p<0.05, * p<0.1

Economic Returns to Breastfeeding

- 10% increase in household income is comparable to estimates of effect of additional year of schooling in UK (Dickenson, 2014) - RoSLA 10%
- Average spend per secondary school pupil per year in England is around £6,000
- Should be possible to achieve additional breastfed child for between £150- £200 (UNICEF UK, 2012)
- Benefits last a life time - 10% increase in median income over 45 years worth £45,000 to individual (gross) and £9,000 to taxperson – NPV discounted at 3.5%
- Even additional 10% of babies breastfed in NI next year would result in gross gain in NPV per annual birth cohort of £108 million, or £21.6 million in additional tax revenue alone. Costs at £200 per additional breastfed child: less than £500,000.

Economic Potential of Breastfeeding in NI

- Implied cost benefit ratios indicate such programmes are likely to have substantial returns and should be viewed as economic investments
- UNICEF report on breastfeeding in the UK considered the potential impact of a large-scale programme to be conducted in Lancashire

- Cost of £446,300 in its first year, recurring annual cost of around £329,300
- Based on their cost of illness analysis, potential short-term cost savings of £355,000 per year.

- Even on the basis of only the reduced treatment costs for the four acute infant diseases they consider, such an intervention could be economically attractive.
- When our direct estimates on income are added to this, the potential benefits imply an even greater return on investment

Institute of Public Health Report

Rollins et al (2016) propose six actions to protect, promote and support breastfeeding:

- Disseminate the evidence – ensure that the value of breastfeeding is recognised
- Foster positive societal attitudes towards breastfeeding
- Show political will – recognise that breastfeeding can save lives and money
- Regulate the breastmilk substitute industry – properly implement the International Code of Marketing of Breastmilk Substitutes (WHO, 1981)
- Scale up and monitor breastfeeding interventions and trends in breastfeeding practices
- Allow institutions to exercise their authority and remove structural and societal barriers that hinder women's ability to breastfeed.

Limitations

- Calculations are intended to illustrate the implied magnitude of the breastfeeding benefits, not designed to be definitive estimates
- Further analysis is required to take account of the uncertainty inherent in these estimates as well as age/cohort earnings and tax profiles
- These are not randomised trial data and we should therefore be appropriately cautious in interpreting the results
- external validity needs to be assessed carefully
- How breastfeeding effects are measured is likely to be important (such as estimating the effect of exclusive and non-exclusive breastfeeding up to various ages).

Conclusions

- If estimated BF effect is broadly correct, implies cost-effective BF programmes are likely to be cost beneficial with substantial economic returns
- Even before accounting for savings associated with better (non-income related) health and cognition
- Systematic reviews provide evidence on which types of interventions are most effective
- Already many impressive initiatives underway here in NI
- Further opportunities for (costless) interventions?

Northern Ireland Assembly

Queen's University Belfast

The Open University

Ulster University

Knowledge Exchange Seminar Series (KESS)

...is a forum that encourages debate on a wide range of research findings, with the overall aim of promoting evidence-based policy and law-making within Northern Ireland