Breastfeeding indicators among a nationally representative multi-ethnic sample of New Zealand children

Teresa Castro, Cameron Grant, Clare Wall, Michaela Welch, Emma Marks, Courtney Fleming, Juliana Teixeira, Dinusha Bandara, Sarah Berry, Susan Morton

ABSTRACT

AIMS: To describe breastfeeding initiation and duration, and demographic associations with breastfeeding duration within a representative sample of New Zealand infants.

METHODS: In 6,685 singletons enrolled in the *Growing Up in New Zealand* cohort we described breastfeeding initiation (96%), any (94%) and exclusive (93%) breastfeeding (EBF) duration. We used adjusted relative risk (RR) and 95% confidence intervals (CI) to describe associations with breastfeeding duration.

RESULTS: Breastfeeding initiation occurred for 97%. Sixteen percent were EBF to age six months and 13% were breastfed to age 24 months. Exclusive breastfeeding for ≥4 months was less likely for children of mothers of Māori (RR=0.80, 95% CI 0.73–0.87), Pacific (0.90, 95% CI 0.83–0.98) or Asian (0.80, 95% CI 0.74–0.86) ethnicity. Children of mothers aged 20–29 years (1.24, 95% CI 1.04–1.49); ≥30 years (1.36, 95% CI 1.14–1); with a tertiary education (1.14, 95% CI 1.08–1.21); or planned pregnancy (1.14, 95% CI 1.08–1.21); and children with older siblings (RR=1.31, 95% CI 1.17–1.47) were more likely to be exclusively breastfed for ≥4 months. Children were more likely to be breastfed ≥6 months if their mother was aged 20–29 (1.26, 95% CI 1.10–1.45) or ≥30 years (1.40, 95% CI 1.22–1.61), had a tertiary education (1.11, 95% CI 1.06–1.59) or planned pregnancy (1.11, 95% CI 1.06–1.15), or if they had older siblings (1.04, 95% CI 1.00–1.08).

CONCLUSION: In New Zealand, most children are initially breastfed, however a large proportion did not receive the recommended duration of any or exclusive breastfeeding. Maternal age, education, parity and pregnancy planning identify children at risk of shorter duration of breastfeeding and EBF, and maternal ethnicity identifies children at risk of shorter EBF duration.

Breastfeeding reduces the risk of child deaths and of infectious disease morbidity.[1] Breastfeeding is associated with fewer dental malocclusions, higher intelligence quotient scores and a reduced risk of overweight and diabetes.[1]

The World Health Organization (WHO) recommends breastfeeding initiation in the first hour after birth, exclusive breastfeeding to age six months and continued breastfeeding to age two years and beyond, with nutritionally, adequate, safe and age-appropriate complementary feeding starting at age six months.[2] The Global Strategy for Infant and Young Child Feeding (IYCF) developed by the WHO and the United Nations Children's Fund (UNICEF) establishes the worldwide core indicators for breastfeeding monitoring: early breastfeeding initiation, exclusive breastfeeding to age six months and continued breastfeeding to age one year. Where core indicators are unavailable, alternative indicators that can be used are: child ever breastfed, continued

breastfeeding at two years, age-appropriate breastfeeding, predominant breastfeeding under six months of age and median breastfeeding duration. With the exception of 'early initiation of breastfeeding' and 'children ever breastfed', all indicators should describe current status.[3]

Reviews conducted by the Organisation for Economic Co-operation and Development (OECD), which includes mostly high-income countries, highlight that, despite the high policy relevance of breastfeeding as an indicator of child`s wellbeing, the poor quality of national-level data limits the capacity for between-country comparisons.[4] For example, a recent WHO attempt to describe global trends in breastfeeding indicators showed that, among high-income countries, data was limited to 37 of 75 countries and, for most, information about early initiation or exclusive or continued breastfeeding duration at two years were not available.[1]

In general, the proportion of children ever breastfed is smaller in high-income (averaging 82%), compared with low-and-middle-income countries (averaging 95%). While most infants in low-income countries are still breastfed at age one year, this duration is achieved on average for less than 20% of infants in high-income countries.[1] In addition, the available data show wide variability in exclusive breastfeeding rates between high-income countries. For example at age six months, the percentage of children exclusively breastfeed were: Spain (25%), Canada (14%), the US (14%), Sweden (12%), Poland (4%) and Bulgaria (2%).[5–6]

In New Zealand, data on breastfeeding indicators are collected by Lead Maternity Carers (LMCs) and Well Child providers (*Plunket National Child Study*).[7] In 2010, 85.7% of all women giving birth were registered with a LMC provider. LMCs report information on breastfeeding status (exclusively, fully, partial, artificial feeding) when infants are discharged from their care.[7] The *Plunket system* collects information on breastfeeding at Well Child visits at age six weeks, three and six months. It also reports on food and drink items that infants received in the 48 hours prior to each visit.

One important limitation of the breastfeeding data available in New Zealand is that coverage for all births is incomplete. The *Plunket system*[7] currently enrols 88% of the newborn population, however Māori and Pacific mothers are under-reported in the data collected.[8] Currently, New Zealand does not have data on breastfeeding indicators that is generalisable to the national birth cohort.

Successful breastfeeding depends on several factors related to the child, mother and environment. The investigation of social determinants of initiation, duration and exclusivity of breastfeeding, at a population level, has important implications for public health interventions that aim to increase breastfeeding rates and to allow measurement of effectiveness of interventions over time.[9] We aimed to describe, in a contemporary representative sample of New Zealand children, the indicators of breastfeeding initiation and duration, and to identify independent maternal and household characteristics associated with duration of any and exclusive breastfeeding.

Methods

Growing up in New Zealand cohort and study population

We completed this study within New Zealand's contemporary child cohort study, *Growing Up in New Zealand*, which enrolled 6,822 pregnant women. The child cohort consists of 6,853 children who survived to age six weeks.[10,11] Eligibility of pregnant women was determined by an estimated delivery date between 25 April 2009 and 25 March 2010, and residence while pregnant in the New Zealand region defined by the three contiguous district health boards of Auckland, Counties Manukau and Waikato. There were no other inclusion or exclusion criteria. Alignment of the cohort with all births in New Zealand between 2007 and 2010 has been demonstrated.[12] Ethical approval was granted by the Ministry of Health Northern Y Regional Ethics Committee (NTY/08/06/055), and written informed consent was obtained from all mothers.[12]

Measurement of breastfeeding initiation and duration

WHO definitions of breastfeeding initiation and duration were used: a) not breastfed; b) any breastfeeding, defined as receiving some breast milk but also receiving other milk and/or solids and; c) exclusive breastfeeding, defined as receiving only breast milk and no other milk, solids, fluids or water.[13] Information on these indicators was obtained through maternal report with data collected at face-to-face interviews when the children were nine

months old and telephone interviews when the children were six weeks, 31 and 45 months old.

The description of breastfeeding initiation used information collected when the children were nine, 31 and 45 months old. Breastfeeding initiation was defined by the question "*Did you ever breastfeed this baby?"* The description of breastfeeding duration used information collected when the children were nine and 31 months old and was determined by the question *"How old was your baby when you stopped breastfeeding?".* For the children that were still being breastfed at the nine-month interview, or for whom information on breastfeeding duration was missing at that time point, information about breastfeeding duration was obtained from the 31-month interview. The description of exclusive breastfeeding duration used the information collected when the children were nine months old and was determined by the question "*How long did you exclusively breastfeed? By exclusively I mean feeding baby only breast milk (including expressed breast milk) and not any water, milk formula, other liquids or solid foods*".

The duration of exclusive breastfeeding (in months) reported by the mothers was corrected for the information about the child's feeding reported when they were six weeks old and by the age of introduction of foods or drinks reported when they were nine months old. At the six-week interview the mothers were asked how they were feeding their babies (only breast milk; mainly breast milk but has also received some water-based drinks, only formula; formula and breast milk, others). At the nine-month interview each mother was asked how old their child was when they first tried a list of 25 food items (infant milk formula or milk; baby rice; baby breakfast cereal; other cereal; bread or toast; rusks; biscuits; vegetables; fruit; meat; fish; eggs; puddings; nuts or peanut butter; shellfish; soy foods; sweets; chocolate; hot chips; potato chips/crisps; fruit juices; herbal drinks; tea; coffee; soft drinks). This food list was designed by an experienced dietitian (CRW) who selected the food items based on the Food and Nutrition Guidelines for 0–2 year-olds[7] and foods and beverages commonly fed to infants from a previous study which assessed prevalence of the dietary intake and nutritional status of an ethnically diverse sample of 6–23 month-olds.[14]

Covariates

Maternal and household variables identified as potentially influencing any and exclusive breastfeeding duration were examined. Information on self-prioritised ethnicity, age, parity, pregnancy planning, education and household deprivation were collected at the face-to-face antenatal maternal interview.

Maternal self-prioritised ethnicities were gathered at the most detailed level possible, and were then coded into six Level 1 categories following the Statistics NZ coding criteria; (1) European, (2) Māori, (3) Pacific Peoples, (4) Asian, (5) Middle Eastern, Latin American and African (MELAA), and (6) other, with MELAA and other then combined for analysis purposes.

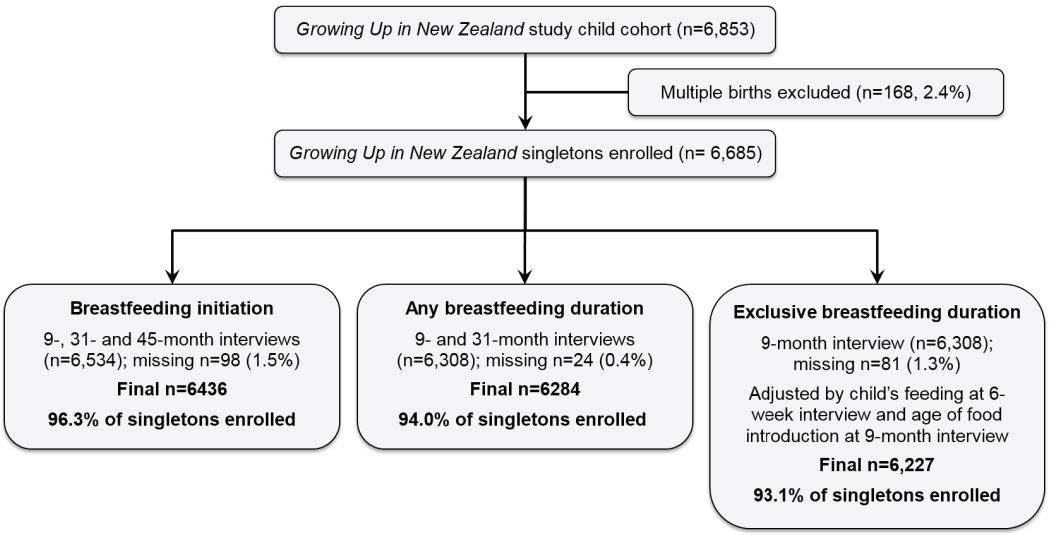
Household deprivation was measured using NZDep06, which combines nine socioeconomic characteristics from 2006 census data collected at aggregations of approximately 100 people and assigned to individual households based on geo-coded address data.[15]

Statistical analyses

Proportions, medians and interquartile ranges (IQR) were calculated. Twins or triplets and children for whom data describing BF indicators or covariates were missing were excluded from the analysis. The rates of any and exclusive breastfeeding duration presented included children who were never breastfed.

For analysis purposes, binary outcome variables for breastfeeding duration were created: <6 vs ≥6 months for any breastfeeding; and <4 vs ≥4 months for exclusive breastfeeding. Poisson regression with robust variance was used to estimate the relationship between the covariates and breastfeeding outcomes. Unadjusted and adjusted relative risk (RR) with 95% confidence intervals (CI) were presented. Analyses were performed using IBM SPSS Statistic 22 software. All P values were two-tailed and $P<0.05$ was the level of significance.

Figure 1: Number of children enrolled in the *Growing Up in New Zealand* cohort study included in each of the breastfeeding indicator estimates.



Results

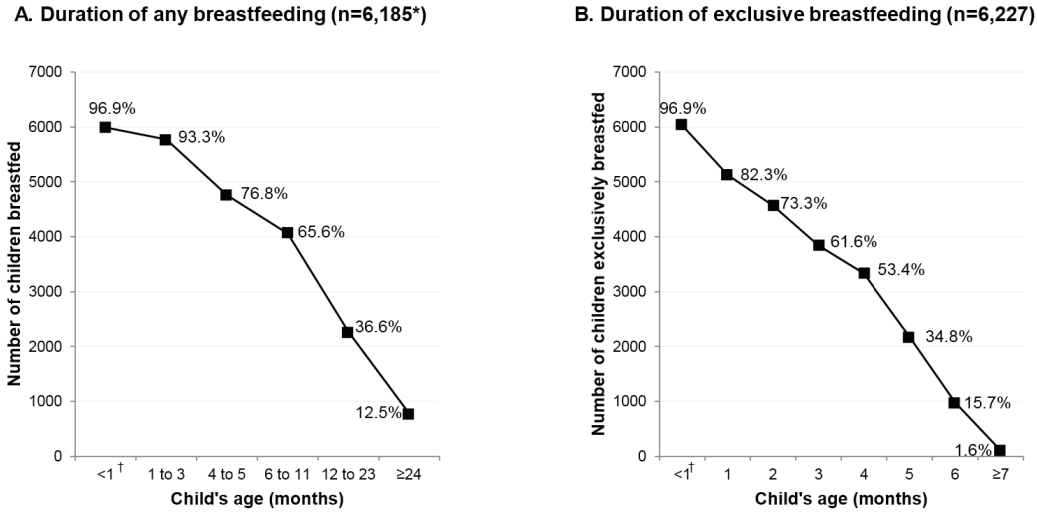
Study population and breastfeeding initiation

From the 6,853 children enrolled, 6,685 (97.6%) were singletons. Information about breastfeeding initiation, any and exclusive breastfeeding duration were available for 96.3%, 94.0% and 93.1% of these 6,685 children, respectively. Breastfeeding was not initiated for 193 (3%) of the children (Figure 1). Rates of breastfeeding initiation varied by maternal ethnicity: Māori (95.4%), Pacific (94.7%), European (97.6%), Asian (98.0%) and others (99.6%); (P<0.001). Compared to children of European mothers, children whose mothers were of Māori (RR=1.89, 95% CI 1.32–2.72) or Pacific (RR=2.16, 95% CI 1.53–3.04) ethnicity were less likely to have breastfeeding initiated.

Any and exclusive breastfeeding duration

Median (IQR) duration of any and exclusive breastfeeding were seven (4.0–12.0) and four months (2.0–5.0), respectively. At age six months, one and two years, 65.6%, 36.6% and 12.5%, respectively, of the children were still being breastfed. At age four and six months 53.4%, and 15.7% of the children, respectively, were being exclusively breastfed (Figure 2).

Figure 2: Duration of any breastfeeding (A) and exclusive breastfeeding (B), as defined by parental report.



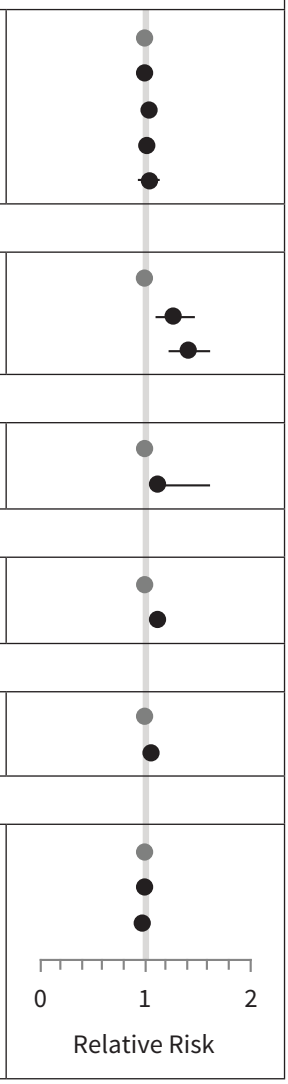
*Does not include 99 children still being breastfed at nine months but for whom subsequent information on breastfeeding duration was not available.
†The age category '<1 month' included children breastfed for 1–14 days.

Rates of any and exclusive breastfeeding by maternal demographics

Maternal age, education, pregnancy planning and parity were independently associated with the duration of any breastfeeding (Table 1). The likelihood of any breastfeeding for ≥6 months was increased for children of women: who were aged 20–29 (RR=1.26, 95% CI 1.10–1.45) or ≥30 (RR=1.40, 95% CI 1.22–1.61) versus <20 years old; who had a tertiary (RR=1.11, 95% CI 1.06–1.59) versus secondary or less education; for whom this was a planned (RR=1.11, 95% CI 1.06–1.15) pregnancy; or was their first child (RR=1.04, 95% CI 1.00–1.08).

Table 1: Associations of maternal and household demographics with duration of any breastfeeding.

Maternal and household demographics	Any breastfeeding for six months or more		Adjusted and unadjusted relative rates for breastfeeding for six months or more		
	Yes N=1,934 n (%)	No N=4,157 n (%)	Unadjusted RR (95% CI)	Adjusted RR (95% CI)	Forest plot of adjusted RR
Self-prioritised ethnicity					
European	2,364 (71)	985 (29)	1.00	1.00	
Māori	492 (61)	311 (39)	0.87 (0.82–0.92)	0.98 (0.92–1.04)	
Pacific	518 (64)	398 (36)	0.90 (0.85–0.95)	1.02 (0.95–1.08)	
Asian	6,220 (69)	274 (31)	0.98 (0.94–1.03)	1.01 (0.96–1.06)	
Other*	153 (72)	61 (28)	1.01 (0.93–1.10)	1.02 (0.94–1.12)	
Age group					
<20	123 (45)	149 (55)	1.00	1.00	
20–29	1,475 (63)	863 (37)	1.39 (1.22–1.60)	1.26 (1.10–1.45)	
≥30	2,559 (74)	922 (26)	1.63 (1.42–1.86)	1.40 (1.22–1.61)	
Education					
Secondary level or lower	1,077 (60)	706 (40)	1.00	1.00	
Tertiary	3,074 (72)	1,218 (29)	1.18 (1.14–1.24)	1.11 (1.06–1.59)	
Pregnancy planning					
Unplanned	1,412 (61)	897 (39)	1.00	1.00	
Planned	2,733 (73)	1,025 (27)	1.19 (1.14–1.23)	1.11 (1.06–1.15)	
Parity					
First Child	1,708 (66)	889 (34)	1.00	1.00	
Subsequent child	2,449 (70)	1,041 (30)	1.07 (1.03–1.10)	1.04 (1.00–1.08)	
Household deprivation†					
1 to 3 (least deprived)	1,136 (73)	427 (27)	1.00	1.00	
4 to 7	1,576 (69)	702 (31)	0.95 (0.91–0.99)	0.98 (0.94–1.02)	
8 to 10 (most deprived)	1,444 (64)	804 (36)	0.88 (0.85-0.92)	0.97 (0.92–1.01)	



*Other includes Middle Eastern, Latin American and African.

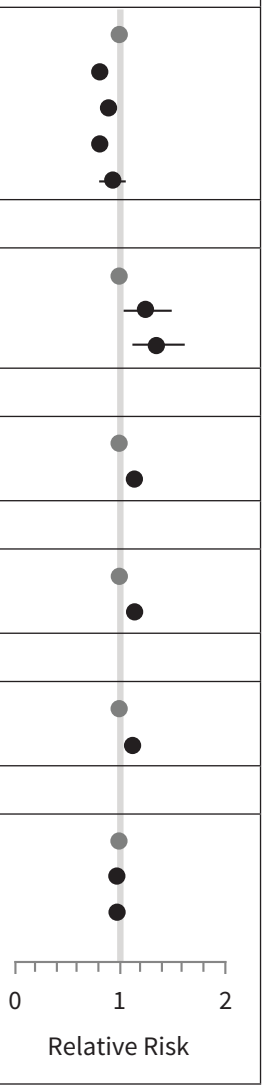
†Area-level socio-economic deprivation was measured using the NZ Index of Deprivation, Dep 1,2 & 3 = least deprived, Dep 8,9 & 10 = most deprived households.[15]

RR – Relative Risk; CI – confidence interval.

Interactions not included in this model. Missing number of cases for: self-prioritised ethnicity (103), Age group (86), education (104), pregnancy planning (116), parity (93), household deprivation (88).

Table 2: Associations of maternal and household demographics with duration of exclusive breastfeeding.

Maternal and household demographics	Exclusive breastfeeding for four months or more		Adjusted and unadjusted relative rates for exclusive breastfeeding for four months or more		
	Yes N = 3,328 n (%)	No N = 2,706 n (%)	Unadjusted RR (95% CI)	Adjusted RR (95% CI)	Forest plot of adjusted RR
Self-prioritised ethnicity					
European	2,047 (62)	1,283 (38)	1.00	1.00	
Māori	345 (44)	448 (56)	0.71 (0.46–0.65)	0.80 (0.73–0.87)	
Pacific	393 (49)	414 (51)	0.79 (0.73–0.85)	0.90 (0.83–0.98)	
Asian	417 (47)	462 (53)	0.77 (0.72–0.83)	0.80 (0.74–0.86)	
Other*	120 (56)	94 (44)	0.91 (0.81–1.03)	0.93 (0.82–1.04)	
Age group					
<20	94 (31)	177 (66)	1.00	1.00	
20–29	1,152 (50)	1,169 (50)	1.46 (1.23–1.74)	1.24 (1.04–1.49)	
≥30	2,085 (61)	1,360 (39)	1.78 (1.50–2.11)	1.36 (1.14–1.62)	
Education					
Secondary level or lower	830 (47)	937 (53)	1.00	1.00	
Tertiary	2,494 (59)	1,761 (41)	1.25 (1.18–1.32)	1.14 (1.08–1.21)	
Pregnancy planning					
Unplanned	1,069 (47)	1,211 (53)	1.00	1.00	
Planned	2,250 (60)	1,485 (40)	1.28 (1.22–1.35)	1.14(1.08–1.21)	
Parity					
First child	1,310 (51)	1,260 (49)	1.00	1.00	
Subsequent child	2,018 (58)	1,446 (42)	1.14 (1.09–1.20)	1.12 (1.07–1.18)	
Household deprivation†					
1 to 3 (least deprived)	949 (61)	606 (39)	1.00	1.00	
4 to 7	1,273 (56)	983 (44)	0.92 (0.88–0.98)	0.98 (0.93–1.04)	
8 to 10 (most deprived)	1,105 (50)	1,116 (50)	0.81 (0.77–0.86)	0.97 (0.91–1.03)	



*Other includes Middle Eastern, Latin American, and African.
†Area-level socio-economic deprivation was measured using the NZ Index of Deprivation, Dep 1,2 & 3 = least deprived, Dep 8,9 & 10 = most deprived households.[15] RR – Relative Risk; CI – confidence interval.
Interactions not included in this model. Missing number of cases for: self-prioritised ethnicity (103), Age group (86), education (104), pregnancy planning (116), parity (93), household deprivation (88).

Maternal ethnicity, age, education, pregnancy planning and parity were independently associated with the duration of exclusive breastfeeding (Table 2). The likelihood of exclusive breastfeeding for ≥4 months was decreased for children of women of Māori (RR=0.80, 95% CI 0.73–0.87), Pacific (RR=0.90, 95% CI 0.83–0.98) or Asian (RR=0.80, 95% CI 0.74–0.86) compared with European ethnicity. The likelihood of exclusive breastfeeding for ≥4 months was increased for children of women: who were aged 20–29 (RR=1.24, 95% CI 1.04–1.49) or ≥30 (RR=1.36, 95% CI 1.14–1.62) versus <20 years old; who had tertiary (RR=1.14, 95% CI 1.08–1.21) compared with secondary or less education; for whom this was a planned pregnancy (RR=1.14, 95% CI 1.08–1.21); or was their first child (RR=1.31, 95% CI 1.17–1.47).

Discussion

This is the first description of breastfeeding indicators in a New Zealand sample generalisable to the national birth cohort. Breastfeeding was initiated for 97% of children, 16% were exclusively breastfed at age six months, 37% were breastfed for ≥12 months and 13% for ≥24 months. First-born children, those from unplanned pregnancies, and those whose mothers were younger (<20 years old) or less educated were at greater risk of having a shorter duration of any or exclusive breastfeeding. In addition, children of mothers of Māori, Pacific or Asian ethnicity were at increased risk of a shorter duration of exclusive breastfeeding. For most of the associations found, the effect size was greater than 10%, which is a clinically and statistically significant magnitude when we consider the generalisability of the cohort. According to Gigerenzer (2008),[16] interpretation of the RRs is dependent on the study parameters and the outcomes under investigation.

It is important to highlight the differences in methodologies used when we compare our data describing breastfeeding in preceding months with global information on breastfeeding provided by WHO/UNICEF, which included studies that collected information describing breastfeeding in the preceding 24 hours.[1] The percentage of children ever breastfed (97%) and children breastfed for one year or beyond (37%) within our cohort was higher than average rates reported for high-income countries globally (~82% and <20%, respectively).[1] However, according to the *World Breastfeeding Trend Initiative*,[17] a tool developed to monitor the *WHO Global Strategy for Infant and Young Child Feeding*,[3] the median duration of breastfeeding in New Zealand (seven months) ranks in the lowest quartile globally for this indicator.

Breastfeeding rates found in our study were higher or comparable to rates reported in representative surveys and cohort studies that used retrospective assessments in high-income countries.[18–24] The proportion of children ever breastfed in our study (97%) was higher than reported for Belgium (82%),[18] Canada (72%),[22] the US (79%)[23] and England (70% and 76%).[20,21] Cohort studies conducted in Australia,[24] and with a group of Somali and Iraqi mothers from Norway,[19] reported rates of breastfeeding initiation similar to our cohort: 91% and 93%, respectively. While comparisons are restricted by the use of different age cut-offs, the duration of any and exclusive breastfeeding were longer in our cohort than reported for England,[20,21] the US,[23] Belgium,[18] Canada,[22] Norway[21] and Australia.[24] Only for the indicator 'percentage of children exclusively breastfed at age six months' was there a higher rate reported in the US in 2011 (19%)[23] than in our cohort (16%).

Rates of breastfeeding initiation were comparable, and duration of any and exclusive breastfeeding duration were longer, in our cohort compared with two other contemporary New Zealand child cohort studies: the NZ Asthma and Allergy Cohort Study from Christchurch and Wellington (13% exclusively breastfed at 4–5 months, 31% any breastfeeding at age 12 months),[25] and in the Pacific Islands Families Cohort, from Auckland (9% exclusively breastfed at age six months, 29% any breastfeeding at age 12 months).[26] Only limited direct comparisons of our data with breastfeeding data collected routinely in New Zealand are possible. In New Zealand, breastfeeding status is reported when mothers and their young infants are discharged from their LMC, which usually occurs during the first weeks of infancy.[27] Because the *Plunket system* of well child care provision collects data on breastfeeding status up until the child is six months old, the median duration of breastfeeding cannot be estimated. The percentage of children exclusively breastfed at six months within our cohort (16%) was higher than that reported by the *Plunket System* in 2011 (12%).[8]

Similar to our observations, previous cohort studies have reported shorter breastfeeding[18,20,22,24] and exclusive breastfeeding duration[22] among younger mothers. In our cohort, children with older siblings were more likely to be breastfed and exclusively breastfeed for longer. Longer duration of any breastfeeding among children with siblings was also reported in cohort studies in Australia and England.[20,24] The association observed of higher maternal education with longer duration of any and exclusive breastfeeding is consistent with observations

reported previously in Australia, Canada, England and the US.[20,22,24,28] In addition to the experience gained from having previous children, older women have more opportunity to have completed their formal education.[29] Women with more education tend to have more access to family and social supports, which enable breastfeeding to be continued, for example, access to more flexible work arrangements and the capacity to return to part-time employment.[28]

Similar to our findings, previous cross-sectional studies have reported associations between unplanned pregnancies and shorter breastfeeding duration.[29–31] Planning for a pregnancy is believed to involve thinking beforehand about how the baby will be fed, which can facilitate the mothers' commitment to breastfeeding.[29,31] A cross-sectional study that included data from 18 developing countries showed that maternal attitude towards the pregnancy is an independent predictor of breastfeeding duration.[30] However, longitudinal studies are required to understand the causal inferences and relationships between pregnancy intentions, prenatal care behaviours and subsequent pregnancy and infancy outcomes, including breastfeeding.[30]

Previously reported associations of maternal ethnicity with breastfeeding patterns differ from those observed in this study. We observed lower rates of breastfeeding initiation among children whose mothers were of Māori or Pacific ethnicity, and shorter duration of exclusive breastfeeding among children whose mothers were of Māori, Pacific or Asian ethnicity. These findings differ from previous cohort studies from England[20] and the UK[19] that showed higher rates of breastfeeding initiation in non-European ethnic groups. Data from the US[28] and from one cohort study conducted in north England[19] found no association between maternal ethnicity and exclusive breastfeeding duration. Differences in breastfeeding patterns between ethnic groups are influenced by both cultural contexts and country of residence.[18–21,26] Further investigations on barriers to breastfeeding initiation and exclusivity among Māori, Pacific and Asian mothers within our cohort are necessary in order to guide specific interventions for these population groups.

Breastfeeding practices are affected by historical, socioeconomic, cultural and individual factors.[9] Improving breastfeeding practices requires supportive measures at different levels, including legal and policy directives, social support, women's employment conditions, access to healthcare and healthcare provider knowledge and skills to support breastfeeding.[9] Future studies will investigate barriers to breastfeeding initiation and duration, with the aim to developing interventions aimed at improving breastfeeding practices in New Zealand. A meta-analysis conducted by The Lancet Breastfeeding Series Group identified that combined health system and community interventions could increase exclusive breastfeeding 2.5-fold.[9]

Strengths of our study include its antenatal recruitment and representativeness of the contemporary New Zealand birth cohort. Study weaknesses include the potential for recall bias in the description of breastfeeding duration. However, previous studies have shown that maternal recall of breastfeeding initiation and duration offers a valid and reliable estimate for recall periods of three years or less.[32] A number of studies have reported the inaccuracy of EBF duration estimation when information is collected retrospectively,[32–35] indicating that simply asking mothers how long they exclusively breastfed may not be valid. [36] Some authors[35–37] have advocated for the use of accrual methods to evaluate extent of EBF in prospective studies. In our study, in order to minimise recall bias for EBF, we adjusted the information on reported exclusive breastfeeding duration by the reported age of introduction of solids and liquids. Although we may have captured the introduction of water to the child's diet at the six-week interview, we did not specifically ask the age of water introduction at the nine-month interview. Due to this aspect, the estimate of EBF to age six months that was adjusted for age of food introduction could still be an overestimate, potentially including together the children that were exclusively and those predominantly breastfed to age six months.

Conclusions and policy implications

The rate of breastfeeding initiation in New Zealand is favourable compared to most high-income countries and comparable to many low- and middle-income countries.[1] Currently in New Zealand a large proportion of children do not achieve the international recommendations for duration of breastfeeding or exclusive breastfeeding. Clearly New Zealand has some work to do to achieve the global nutrition target of at least 50% EBF to six months of age.[38] Perez-Escamilla & Sellen (2015), based on overwhelming evidence that breastfeeding has health and economic benefits for families and society, suggest that access to breastfeeding protection and support is a human right in the context of social justice and equity.[39] Therefore, any social, economic, political, legal or biomedical factors that prevent women from implementing their choice and right to breastfeed need to be considered through an equity lens. When planning and evaluating the strategies necessary to support, protect and promote breastfeeding in New Zealand, it is important to take the inequalities observed in breastfeeding practices into account and target interventions to at-risk groups.

Competing interests:
Nil.

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Author information:
Teresa Castro, Paediatrics and Growing Up in New Zealand, University of Auckland, Auckland; Cameron Grant, Paediatrics, Growing Up in New Zealand and Centre for Longitudinal Research—He Ara ki Mua; Clare Wall, Discipline of Nutrition and Dietetics, University of Auckland, Auckland; Michaela Welch, Medicine, Boston University, United States; Emma Marks, Growing Up in New Zealand, University of Auckland, Auckland; Courtney Fleming, Auckland District Health Board, Auckland; Juliana Teixeira, Nutrition, University of Sao Paulo, Brazil; Dinusha Bandara, Growing Up in New Zealand, and Centre for Longitudinal Research—He Ara ki Mua, University of Auckland, Auckland; Sarah Berry, Growing Up in New Zealand, University of Auckland, Auckland; Susan Morton, Growing Up in New Zealand, and Centre for Longitudinal Research—He Ara ki Mua, University of Auckland, Auckland.

Corresponding author:
Dr Cameron Grant, Paediatrics, University of Auckland, Grafton Road, Auckland 1142.
cc.grant@auckland.ac.nz

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