Longer duration of breastfeeding associated with reduced healthcare utilization but not reduced incidence of acute respiratory illness in children under 2 years of age

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Background: Longer duration and greater exclusivity of breastfeeding is associated with reduced risk of acute respiratory illness (ARI). However, most studies include children seeking medical care, which may only measure breastfeeding protection against more severe symptomatic infections. We compared ARI incidence and level of healthcare utilization by breastfeeding duration and intensity in PREVAIL, a birth cohort in Cincinnati, Ohio (2017-2020).

Methods: From birth to age two, respiratory symptoms were surveyed *via* weekly text messaging; participants were included in analysis if caregivers completed ≥70% of weekly surveys over ≥70 study weeks. Report of ARI (fever >99°F rectal or cough) triggered additional questions, including start- and end-date of symptoms and healthcare utilization, categorized as symptomatic/not medically-attended (NMA), primary-care (PCP), or emergency department/hospitalization (ED/Hosp). Breastfeeding intensity was based on quarterly maternal surveys and categorized as exclusively/primarily formula-fed (EPFF, <½ of feeds human milk) *vs* exclusively/mostly breastfed (≥½ of feeds human milk). The incidence rate ratio (IRR) of ARI by breastfeeding duration was calculated using Poisson regression. Proportional odds of PCP or ED/Hosp compared to NMA for the first ARI by breastfeeding intensity were calculated using multinomial logistic regression adjusted by child age in weeks and out-of-home childcare attendance.

Results: Among the 161/245 (66%) of PREVAIL participants included in this analysis, all children had at least one ARI in the first two years of life, with a median incidence of 4.5 (IQR 2.5, 6.1) ARI/child-year. Median age for the first ARI was 15 weeks (IQR 8, 23); 71 (44%) of first ARI were NMA, 58 (36%) PCP, and 32 (20%) ED/Hosp, and 40% (*n*=65) of children attended out-of-home childcare at the time of illness. Median breastfeeding duration was 26 weeks (IQR 5, 56). ARI incidence did not differ by weeks of breastfeeding (IRR=1.00, 95%CI 1.00, 1.00), but children who were EPFF at the time of their first ARI were more likely to be ED/Hosp (OR 2.81, 95%CI 1.2, 6.8) than NMA. Odds of PCP did not significantly differ from NMA by breastfeeding intensity. There were no significant differences at any healthcare utilization level by child's age or childcare attendance.

Conclusion: In the PREVAIL Cohort, no association was found between breastfeeding duration and ARI incidence, but primarily or exclusive formula feeding at the time of the first ARI was associated with greater odds of ED/Hosp compared to NMA. Increasing breastfeeding duration and intensity may reduce healthcare burden of ARI in young children.

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Figure 1: ARI counts by weeks of breastfeeding among infants and children from age birth to 2 years, PREVAIL Cohort

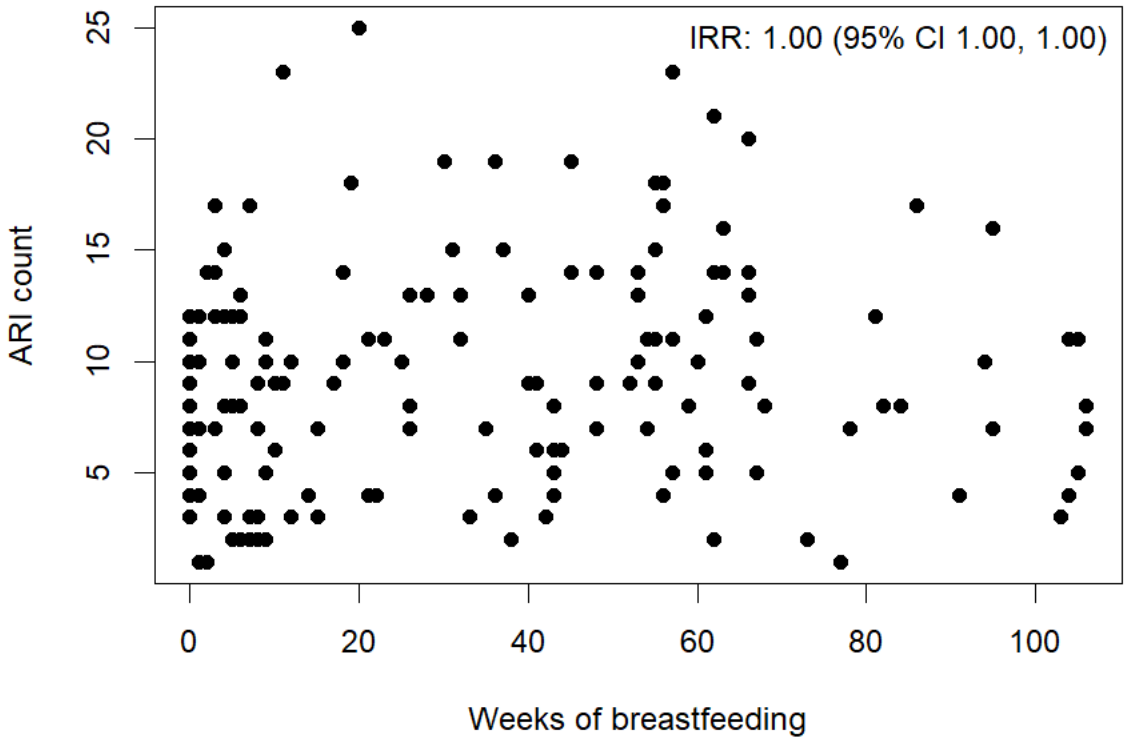

Table 1: level of healthcare utilization with acute respiratory illness associated with breastfeeding status, PREVAIL Cohort

	Level of care[1]			
	Primary Care *n*=58		ED or Hospitalization *n*=32	
Covariates	***OR***	***95% CI***	***OR***	***95% CI***
Primarily/exclusively formula fed[2]	0.85	0.41, 1.79	2.80	1.16, 6.75
Age in weeks	1.00	0.98, 1.03	0.98	0.95, 1.02
Out-of-home childcare[3]	1.02	0.50, 2.05	0.79	0.33, 1.92

ARI: Acute respiratory illness
ED: Emergency department
OR: Odds ratio calculated using a multinomial logistic model

[1]Highest level of care during episode; symptomatic, not medically attended (*n*=71), *reference*
[1]Defined as <½ of feedings were human milk at the time of the ARI; breastfed children with ≥½ of feeds were human milk at time of ARI episode, *reference*
[3]Use of out-of-home childcare based on maternal report, no out-of-home childcare use, reference