

Barriers to meeting the Global Nutrition Target 2025 for Exclusive Breastfeeding: an analysis of three decades (1990, 2000, 2010) in six Latin American and Caribbean countries

Camila Abadia Rodrigues Meira (✉ camila_abadia8@hotmail.com)

UFU: Universidade Federal de Uberlandia <https://orcid.org/0000-0002-8537-2529>

Gabriela dos Santos Buccini

University of Nevada Las Vegas

Catarina Machado Azeredo

UFU: Universidade Federal de Uberlandia

Wolney Lisboa Conde

USP: Universidade de Sao Paulo

Ana Elisa Madalena Rinaldi

UFU: Universidade Federal de Uberlandia

Research

Keywords: Breastfeeding, Weaning, Food Consumption, Latin America

Posted Date: August 9th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-779094/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Background: The World Health Organization set a global nutrition target to increase the rate of exclusive breastfeeding (EBF) among infants younger than 6 months to at least 50% by the year 2025. Yet, the early introduction of solid food (before 6 months of age) occurs in approximately one in three infants, making it a major barrier to EBF. The aim of this study was to analyze the evolution of the early introduction of foods offered to infant under the age of six months in Latin American and Caribbean countries in the last three decades (1990, 2000,2010).

Method: This is a time series study with data from Demographic and Health Surveys carried out between 1990 and 2017 in six countries in Latin America and the Caribbean: Bolivia (1994 to 2008); Colombia (1995 to 2010), Guatemala (1995 to 2015), Haiti (1994/1995 to 2016/2017), Peru (1996 to 2012) and the Dominican Republic (1996 to 2013). The total sample consisted of 20,633 infants under the age of six months. Surveys were grouped in three decades as following: 1990s for surveys from 1990 to 1999; 2000s for surveys from 2000 to 2009; and 2010s for surveys from 2010 to 2017. EBF, predominant breastfeeding (PBF), mixed breastfeeding (mixed BF), supplemented breastfeeding (supplemented BF) and non-breastfeeding (non-BF), and individual foods (water, liquids, milk, formula and semi-solid/solid) were analyzed. Mean prevalence rates of breastfeeding and food indicators were calculated for all countries, according to monthly age groups and decade of survey.

Results: Between 1990s and 2010s, there was an increase in the mean prevalence of EBF (38.6% and 46.2%, respectively) and a reduction in the mean prevalence of PBF (50.8% and 43.0%, respectively). There was a reduction in the means of liquids (1990s=40.4%,2010s=15.9%) and milk (1990s=20.3%,2010s=8.4%) and an increase in water (1990s=31.7%,2010s=37.5%), and formula (1990s=16.4%, 2010s=25.8%).

Conclusions: In the last three decades, in all age groups, there was an increase in the prevalence of EBF, as well as a significant reduction in fluids and milk. The increased supply of water and infant formula are the main barriers to achieving the Global Nutrition Target 2025 for EBF.

Introduction

In 2012, the World Health Organization (WHO) adopted a resolution on maternal and child nutrition that included six Global Nutrition Targets. One of them sets a goal for countries to reach a 50% prevalence of exclusive breastfeeding (EBF) by 2025 (1). However, a recent analysis pointed out that about 163 countries are not on course to meet the EBF target by 2025 (1). In fact, in the region of Latin America and the Caribbean, the EBF rate increased slightly from 35% in 2005 to 38% in 2018, but at this rate of annual growth it would take more than 40 years for the global EBF target to be reached (1). Thus, it is critical to understand the barriers for EBF in Latin American and Caribbean countries (2).

The early introduction of solid food before six months of age, which occurs in approximately one in three infants in the United States (3), is one of the multiple barriers for the maintenance of EBF. Other barriers include factors related to (i) the organization of support services for the management of breastfeeding (BF), such as the lack of preparation of health professional teams; (ii) political factors such as the absence or short duration of maternity leave (4, 5); (iii) cultural factors such as the perception of insufficient milk production by the mother and the use of a pacifier (6, 7); (iv) the partial implementation and weak monitoring of the International Code of Marketing of Breastmilk Substitutes (WHO Code) which may contribute to the unrestricted promotion of infant formula (4).

Although studies on the trend of BF in Latin America describe an increase in its duration until the end of the 2000s (8, 9), there are no investigations on the types of foods that are offered in addition to or as a substitute for breast milk and how much each food contributed to the interruption of EBF over three decades (1990s, 2000s and 2010s). This investigation can indicate what the main foods being offered to infants that prevent the fulfillment of the goal proposed by the WHO are. Thus, the aim of this study was to analyze the evolution of the early introduction of foods offered to infant under the age of six months in Latin American and Caribbean countries in the last three decades (1990, 2000,2010).

Methods

Study design and data source

This is a cross-sectional time-series study carried out using data from the Demographic and Health Surveys (DHS) Program conducted in the 1990s, 2000s and 2010s. The DHS Surveys are household-based surveys comparable across countries and within countries over different time periods with national representation that provide a broad set of data and indicators for monitoring and evaluating impact on demography, health and nutrition, and use these data for policy development, planning of monitoring, and evaluation programs. All data are available on the DHS Program website (<https://dhsprogram.com>). The studies used were previously approved by ethics committees in each country, and the consent form was presented before the interview and signed by the respondents.

Selected countries

The inclusion criteria for the countries were the existence of at least two DHS surveys between the 1990s and 2010s (see Additional file 4) and available variables on foods consumed by the child the day before the survey (see Additional file 1). Based on these criteria, six Latin American countries and a total of 24 databases were included (Table 1): Bolivia (4 databases), Colombia (4 databases), Guatemala (3 databases), Haiti (5 databases), Peru (4 databases) and the Dominican Republic (4 databases).

Table 1
Description of sample characteristics and characterization of pro-breastfeeding actions.

Favorable environment for breastfeeding											
Country Year	Study phase	Sample size	Legal status of the code	Maternity leave	% Births in Baby Friendly Hospitals and Maternities	% Districts Implementing Community Programs	% Primary Healthcare Facilities with Individual IYCF Counselling	Compliance with C183 and R191	Donor Funding (USD) Per Live Birth	Most Recent Exclusive BF report	
Bolivia											
1994	DHS III	615	Moderately aligned	☒ **	9.8	100	100	Does not meet	1.7	2016	
1998	DHS III	743									
2003	DHS IV	906									
2008	DHS V	883									
Colombia											
1995	DHS III	536	Moderately aligned	☒ **	-.*	100	-.*	Meets recommendations	0.04	2015	
2000	DHS IV	503									
2005	DHS V	1545									
2010	DHS VI	1703									
Guatemala											
1995	DHS III	1015	Moderately aligned	☒ **	1.2	100	100	Does not meet	0.66	2014	
1998/1999	DHS IV	514									
2014/2015	DHS VII	1264									
Haiti											
1994/1995	DHS III	341	-.*	☒ **	9.5	100	100	Does not meet	9.40	2016	
2000	DHS IV	627									
2005/2006	DHS V	648									
2012	DHS VI	789									
2016/2017	DHS VII	695									
Peru											
1996	DHS III	1586	Moderately aligned	☒ **	3	-.*	-.*	Does not meet	3.23	2018	
2000	DHS IV	1235									
2007/2008	DHS V	1675									
2012	DHS VI	892									

*No information.

**Maternity leave implemented in the countries studied.

Favorable environment for breastfeeding										
Dominican Republic										
1996	DHS III	419	Moderately aligned	✘ **	12.3	36.7	-*	Does not meet	0.24	2014
1999	DHS IV	53								
2002	DHS IV	1100								
2013	DHS VI	346								
*No information.										
**Maternity leave implemented in the countries studied.										

Next, the enabling environment for BF in each country was synthesized based on documents from the United Nations Children's Fund (UNICEF) and the International Labor Organization (ILO) (Table 1). In summary, regarding the International Code of Marketing of Breast-milk Substitutes, only in Haiti it has not been implemented. The presence of maternity leave was verified in all countries. The percentage of hospitals accredited as child-friendly ranged from 1.2% in Guatemala to 12.3% in the Dominican Republic and the percentage of Districts Implementing Community Programs ranged from 36.7% in the Dominican Republic to 100% in all other countries, except for Peru, which did not have such a pro-BF action. The percentage of Primary Healthcare Facilities with Individual IYCF Counselling was 100% in three out of six countries. Only Colombia did not present compliance with C183 and R191. Donor Funding (in USD) per live birth ranges from \$0.04 in Colombia to \$9.40 in Haiti. The Most Recent EBF Report took place between 2014 and 2018, and the Most Recent WBTi Breastfeeding Program Assessment took place between 2015 and 2017, except for Haiti, which did not carry out any assessments of the tool (Table 1).

Analytical sampling and study population

All DHS surveys are household-based with complex sampling carried out in two stages, with clusters being selected in the first stage and households in the second stage.

Our study population consisted of infants under six months of age who were alive at the time of the interview and who lived with the respondent (see Additional file 4). Based on the established criteria, the total analytical sample consisted of 20,633 infants under six months of age. The description of the sample size according to year and phase of the study are described in Table 1. The percentage of excluded infants ranged from 1.3% in Colombia to 4.6% in Haiti.

Breastfeeding indicators and food variables

The indicators of BF analyzed were EBF, predominant breastfeeding (PBF), mixed breastfeeding (mixed BF), and supplemented breastfeeding (supplemented BF). Infants who were not receiving breast milk were grouped under the heading non-breastfeeding (non-BF).

EBF is defined as feeding breast milk only (numerator: infants under six months who are in EBF / denominator: infants aged 0–5 months); PBF as the provision of breast milk and other water-based liquids (numerator: infants aged 0–5 months who received breast milk and other water-based liquids / denominator: infants aged 0–5 months); mixed BF is the provision of breastmilk supplemented with other types of milk and formula (numerator: infants aged 0–5 months who received breast milk, milk and formula / denominator: infants aged 0–5 months) and supplemented BF is defined as giving breast milk with semi-solid / solid foods (numerator: infants aged 0–5 months who received breast milk and solid foods / semi-solids / denominator: infants aged 0–5 months). In non-BF, the infant received any food other than breast milk.

The definition of the BF indicators adopted in this study was based on the concepts of EBF and PBF recommended by the WHO (10), and according to the concepts of the BF indicators studied (11, 12). BF indicators were configured as dichotomous variables (no/yes).

In this study, foods consumed separately were also analyzed: water, liquids (teas, juices, soft drinks and other water-based liquids), milk, formula and semi-solid/solid foods (see Additional file 1). The food variables were different according to the years of surveys and countries, ranging from 12 to 28 variables (see Additional file 1). All food variables referred to consumption on the day before the interview and were also available as dichotomous variables (no/yes). In Bolivia in 2003; Colombia in 2000 and 2005; the Dominican Republic in 2002; Haiti in 2000; and Peru in 2000, the food variables were available as the number of times a day the food was consumed (0 to 7 times in the last 24 hours) and were also configured as "no/yes", with the objective of making the comparison between the studies conducted in different years compatible. Consumption equal to or greater than one was considered as "yes". Missing data and the category "does not know" in the questions about food were considered as "not consumed", as recommended by the WHO (10).

Data analysis

All analyzes were conducted for the pooled sample (i.e., a sample of the group of six countries in Latin America and the Caribbean) and for the country sample. For the analysis of the decades, the following argument was considered: surveys from 1990 to 1999 were grouped as 1990s, surveys from 2000 to 2009 as 2000s, and surveys from 2010 to 2017 as 2010s. All analyzes were performed using STATA SE® version 14.0.

First, the prevalence rates of BF and food indicators were calculated separately for each country and year of the survey considering the sample design and the weighting factor (country sample). Second, the samples from each country were grouped, and based on the prevalence of each country and year, the mean

prevalence of BF and food indicators per decade were calculated. Due to complex sampling, all analyzes were weighted by the effect of the sampling design of each country and each year of the survey (pooled sample). Third, a descriptive analysis of BF and food indicators by monthly age group per decade was carried out for the pooled sample and country sample. For each country, linear regression weighted by variance was used for trend analysis, whose beta coefficient represented the mean annual variation between the 1990s to 2010s for the BF and food indicators (see Additional file 2 and 3).

Results

Regarding the mean prevalence of BF indicators in the region per decade, we observed a trend towards an increase in EBF means over the analyzed period. There was a slight increase in supplemented BF and non-BF between the 1990s and 2010s. On the other hand, for PBF and mixed BF there was a tendency for a reduction in means in this period (Table 2). Considering the mean prevalence of foods per decade, we can observe that liquids and milk showed a significant and progressive reduction in means between the 1990s and 2010s. We observed an increase in water and solid and semi-solid foods, but the greatest increase was observed for formulas (Table 2).

Table 2
Average prevalence of breastfeeding indicators and food variables according decades. DHS, 1990s, 2000s, 2010s.

	Decades		
	1990	2000	2010
Breastfeeding indicators			
EBF	38.6	45.4	46.2
PBF	50.8	49.0	43.0
Mixed BF	34.4	39.6	33.1
Supplemented BF	23.4	23.7	24.6
Non-BF	5.4	6.4	6.7
Food variables			
Water	31.7	39.8	37.5
Liquids	40.4	22.2	15.9
Milk	20.3	13.2	8.4
Formula	16.4	26.9	25.8
Semi-solids/solids	23.3	23.6	24.6
BF: breastfeeding; EBF: exclusive breastfeeding; PBF: predominant breastfeeding			

At the country level, there was an increase in EBF and a reduction in PBF in all countries except for the Dominican Republic, a reduction in mixed BF in three countries and an increase in the Dominican Republic, and a reduction in supplemented BF in four out of six countries (see Additional file 2).

For the mean prevalence rates of BF indicators according to monthly age group (0–5 months), we note a reduction in the prevalence of EBF and an increase in mean PBF, mixed BF, supplemented BF and non-BF with increasing age in all decades. We highlight the increase in the prevalence of EBF in each monthly age group over the decades, as well as the significant reduction in PBF and mixed BF (Table 3).

Table 3
Average prevalence of breastfeeding indicators according monthly age group and decade.
DHS, 1990s, 2000s, 2010s.

Breastfeeding indicators	Decades	Age group (month)					
		0	1	2	3	4	5
EBF	1990	60.0	50.9	39.8	38.6	29.0	21.4
	2000	65.7	58.3	49.8	41.0	36.4	22.8
	2010	68.4	60.7	51.8	44.5	33.3	22.6
PBF	1990	28.0	33.0	48.6	50.7	62.9	68.3
	2000	28.5	37.6	41.8	52.1	58.3	70.9
	2010	20.7	27.6	37.0	44.7	55.6	67.5
Mixed BF	1990	21.5	30.3	35.5	34.9	40.7	44.6
	2000	31.0	33.5	40.2	41.7	43.2	46.3
	2010	23.9	27.0	32.8	33.8	37.6	40.8
Supplemented BF	1990	3.5	6.2	11.5	22.1	34.9	54.9
	2000	3.0	6.7	10.4	21.6	35.9	57.5
	2010	5.0	7.2	14.2	21.9	36.4	58.9
Non-BF	1990	1.3	2.2	4.3	5.7	8.0	9.9
	2000	1.6	2.0	5.4	6.4	10.3	11.6
	2010	3.6	3.1	5.9	5.8	8.1	12.0
BF: breastfeeding; EBF: exclusive breastfeeding; PBF: predominant breastfeeding							

At the country level, we observe that, in the 0-to-3-month age group, EBF, followed by PBF and mixed BF were the most prevalent indicators, and from the 3rd month onwards, the EBF rate seems to start falling, accompanied by an increase in the introduction of other milk with BF (mixed BF) or semi-solid and solid foods (complemented BF). From 0 to 3 months, the prevalence of supplemented BF decreased, and from the 3rd month to the 5th month its prevalence increased. Non-BF increases as the infant's age increases (see Additional file 5, 6 and 7).

When analyzing the foods indicators separately, we found an increase in consumption with increasing age in all decades (Table 4). The prevalence of water and food supply was similar over the decades. We witnessed a progressive increase in semi-solids/solids, especially between the 3rd and 4th month of age. There was a significant reduction in the prevalence of liquids and milk, progressively between the 1990s and 2010s, in all age groups. The prevalence of infant formula increased between decades, especially in the 2000s, and the prevalence appears to be constant across all age groups within each decade (Table 4).

Table 4
Average prevalence of food variables according monthly age group and decade.
DHS, 1990s, 2000s, 2010s.

		Age group (month)						
Foods	Decades	0	1	2	3	4	5	
Water	1990	16.4	22.6	32.0	33.2	37.5	42.9	
	2000	23.1	32.2	35.4	44.2	46.9	54.4	
	2010	18.1	24.1	34.3	41.7	48.1	55.2	
Liquids	1990	20.7	27.9	35.4	39.2	52.4	59.1	
	2000	4.6	9.3	13.0	21.3	31.5	49.6	
	2010	5.2	5.5	9.0	12.3	22.3	37.9	
Milk	1990	10.0	12.5	18.6	18.7	25.4	31.6	
	2000	5.2	6.8	10.4	12.6	19.9	22.9	
	2010	3.7	4.4	6.8	7.8	11.0	14.7	
Formula	1990	12.9	18.8	17.7	18.3	16.7	14.9	
	2000	26.3	26.2	30.1	29.6	24.7	25.6	
	2010	20.6	23.1	26.9	27.2	28.0	27.5	
Semi-solids/solids	1990	3.5	6.2	11.5	22.1	34.6	54.9	
	2000	2.9	6.7	10.4	21.6	35.9	57.5	
	2010	4.9	7.2	14.2	21.9	36.4	58.9	

At the country level, we see a significant reduction in water in Haiti (-1.9 percentage points) and a less pronounced reduction in Bolivia, Colombia and Peru. In all countries, except for the Dominican Republic, we observed a significant reduction in liquids and milk. There was an increase in formula consumption in 50% of the countries and a reduction in semi-solids/solids in four out of six countries (see Additional file 3).

Discussion

Our study is the first known to explore barriers to achieving the Global Nutrition Target 2025 for Exclusive Breastfeeding in Latin America and the Caribbean. Our results showed an increase in EBF prevalence rates and a marked reduction in PBF in the three decades analyzed (1990s, 2000s and 2010s). As expected, we found that BF and infant feeding indicators vary depending on the infant's age. Between zero and three months, there was an increase in the prevalence of EBF over the decades. Among the foods offered to infants, the significant reduction in the prevalence of milk and liquids in all age groups may have contributed, in part, to the increase in EBF among infants under three months of age. The increased prevalence of formulas and water may have contributed, in part, to the maintenance of supplemented BF, which remained virtually the same for all age groups, being less than 10% for those under the age of 2 months, reaching close to 50% at 5 months. Thus, strategies to promote BF with a focus on reducing the early supply of water and formulas are potential methods for the Latin American and Caribbean region to reach the threshold of 50% of EBF established by the Global Nutrition Target 2025.

We observed an increase in the prevalence of EBF over the decades, especially in the age range from birth to the second month of life. While these findings indicate that perhaps more infants have been exposed to EBF since birth, on the other hand, we found a high consumption of liquids, milk and especially water in the first month of life, possibly due to cultural issues, and the lack of guidance in BF after birth in hospitals. Although the Baby-Friendly Hospital Initiative (BFHI) has been implemented in all study countries, the numbers of births performed in hospitals with this initiative are still very low. Babies born in the BFHI are more likely to be breastfed upon hospital discharge and maintain EBF for up to six months (1, 13, 14). This is because the BFHI favors the training of health professionals to support mothers and infants on the initial difficulties of BF, through adequate guidance and support in hospitals right after birth, which also helps to increase EBF rates (13). In this sense, a higher percentage of BFHI in the countries studied may favor the practice of EBF, and reduce the early introduction of water, liquids and milk in the first months of life (1, 15).

From the third and fourth month on, there is a sharp drop in EBF rates in all years of study and in all countries. The drop in EBF from the third month on seems to coincide with the duration of maternity leave in the countries studied. The duration of maternity leave in the countries studied varies from 12 to 14 weeks, that is, the end of maternity leave may partly explain the drop in EBF in this age group, and contribute to the early introduction of food before six months of age (16). Evidence has shown that support in the workplace (17), such as flexible working hours and a suitable place to extract breast milk or breastfeed (18) can support the maintenance of EBF among working mothers (19, 20). On the other hand, the informal market in Latin America is very large and legal protection such as maternity leave is not available for those women, therefore measures to protect informal workers are necessary. An alternative to make maternity leave available to the women who are in the informal market in Latin America and the Caribbean is the transfer of maternity income (21). Another potential explanation for the drop in EBF from the third month of life onwards, it may be related to threats to the maternal self-efficacy in maintaining EBF due to changes in the baby's eating and crying behaviors, in the volume of the breast (due to regulation of baby's demand), family beliefs about introduction of complementary food, pacifier use among others (6, 7, 22, 23).

Although we observed the increase in the prevalence of EBF over the decades of this study, we also noticed its reduction according to the evolution of the monthly age groups between the 1990s and 2010s. These findings point to the need to invest in continued support for BF, through the implementation and scale up of individual and group infant and young child feeding counselling in community-based programs and Primary Healthcare Facilities (1). Community programs play an important role in improving BF practices, precisely because they support women in maintaining and overcoming barriers during the BF period (1). Evidence has shown that providing advice through qualified health professionals about the infant and young child feeding increases women's knowledge, practice and confidence in BF (1). Indeed, infant and young child feeding counseling interventions can increase global EBF rates by 12–16% (24, 25). In 2019, UNICEF indicated that globally 47% of countries have community programs that include infant and young child feeding counselling, which is far from proposed target of 80% by 2030 (1). In order to achieve this goal, Latin America and the Caribbean must increase their capacity to finance BF programs (26).

In our study, we observed an increase in the prevalence rates of water in all decades according to the evolution of the monthly age groups, especially from the third month of life onwards. The consumption of water is present in a high percentage of infants under six months of age, and this consumption can place infants's health at risk since there is the hypothesis of water contamination due to sanitation issues in Latin American and Caribbean countries (27). Water seems to be one of the foods that most contributes to the early introduction of food in infants under six months of age, and this supply of water and other liquids such as teas and juices is strongly related to the maternal and family belief in the relief of colic and gases, and to quench the baby's thirst (28).

In the same sense, we observed an increase in the prevalence of infant formulas over the decades and in all age groups of infants. The supply of milk other than breast milk is also related to the maternal belief of weak milk, and the maternal expectation of offering more energy and nutrients to the baby (29). Additionally, problems related to the breasts in the immediate postpartum period may also influence the supply of formula or food supplement soon after birth (13, 30). Evidence points to formula as one of the foods that most contributes to the early introduction of food before six months of life (13, 30). On the other hand, consumption of infant formula is better for the infant's health when compared to consumption of cow's milk, other foods, and liquids before six months of age, but breast milk is the best food for the baby when compared to infant formula (12). Some authors have attributed this change in dietary patterns, that is, the increase in the supply of formulas, and the decrease in the supply of other milk found in our study, to the improvement in the socioeconomic situation of Latin American and Caribbean countries with increased access to and sales of infant formulas (31, 32).

Although all countries in our study, except for Haiti, adopt all components of the International Code of Marketing of Breast Milk Substitutes (Code), we have not identified public data on inspection and monitoring in the literature. In this context, strengthening the Code becomes even more critical in conjunction with other strategies to promote, protect, and support BF that can contribute to reducing the use of formulas (1, 33).

Our study has some limitations that need to be considered when interpreting the results. We highlight one limitation in relation to differences in the availability of food variables according to the year of study. One of the policy implications for Latin America and the Caribbean was the systematization of indicators by WHO in 2008, which possibly served as a guide for countries to increase the availability of food variables. We believe that increasing the number of food variables from the first to the last stages of the study could make the frequency of EBF lower than the data we found, as it gives the mother more food options to remember. Another limitation is the inaccuracy of the age at which the child was introduced to foods, as this question was not addressed in the DHS survey.

Nevertheless, the strengths of our study are the use of nationally representative surveys, analysis of six Latin American countries over a long period of time, and analysis by monthly age group of what was being offered to infants who were not exclusively breastfed, to understand if the type of food that interferes with BF has changed over time. Thus, our analyzes are important to support health professionals and especially health managers to understand the situation of infant feeding in the first six months of life in Latin America, as we observe that breast milk is being supplemented or replaced by formulas.

Conclusions

In the period from the 1990s to 2010s we observed an increase in EBF prevalence means, especially in the first three months of the infant's life. BF and infant feeding indicators are functions of the infant's age, with supplemented BF, non-BF, water, formula, and semi-solids/solids increasing as the infant's age advances in the study period. Strategies to reduce the early supply of water and formulas are critical for Latin America and the Caribbean to reach the 50% EBF target established by the Global Nutrition Target 2025.

Abbreviations

EBF - Exclusive Breastfeeding

PBF - Predominant Breastfeeding

Mixed BF - Mixed Breastfeeding

Supplemented BF - Supplemented Breastfeeding

Non-BF - Non-breastfeeding

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

The dataset is freely available for download at: <https://dhsprogram.com/Countries/>.

Competing interests

We declare that we have no conflict of interest.

Funding

Not applicable.

Authors' contributions

Camila Abadia Rodrigues Meira - contributed to the conception and design of the study, interpretation of results, writing of the manuscript and approval of the final version.

Gabriela dos Santos Buccini – contributed to the interpretation of results, writing of the manuscript and approval of the final version.

Catarina Machado Azeredo – contributed to writing of manuscript and approval of the final version.

Wolney Lisboa Conde - contributed to the conception and design of the study and approval of the final version.

Ana Elisa Madalena Rinaldi - contributed to the conception and design of the study, data analysis, interpretation of results, writing of the manuscript and approval of the final version.

Acknowledgements

This manuscript is the result of the master's thesis by student Camila Abadia Rodrigues Meira from the Post-Graduate Program in Health Sciences at the Federal University of Uberlândia, scholarship holder in the social demand scholarship program of the Coordination for the Improvement of Higher Education Personnel - CAPES Foundation.

References

1. World Health Organization (WHO). Increasing commitment to breastfeeding through funding and improved policies and programmes: Global breastfeeding scorecard 2019. [http://www.who.int/nutrition/publications/infantfeeding/global-bf-scorecard-2019/en/\(2019\)](http://www.who.int/nutrition/publications/infantfeeding/global-bf-scorecard-2019/en/(2019)). Accessed January 2021.
2. Finnie S, Pérez-Escamilla R, Buccini G. Determinants of early breastfeeding initiation and exclusive breastfeeding in Colombia. *Public Health Nutrition*. 2020 Feb;23(3):496–505.
3. Chiang KV. Timing of Introduction of Complementary Foods – United States, 2016–2018. *Morbidity and Mortality Weekly Report*. 2020 Nov 27; 69(47).
4. Rollins NC, Bhandari N, Hajeerhoy N, Horton S, Lutter CK, Martines JC, et al. Why invest, and what it will take to improve breastfeeding practices? *The Lancet*. 2016 Jan 30;387(10017):491–504.
5. Nardi AL, Frankenberg AD von, Franzosi OS, Santo LC do Nardi E, AL, Frankenberg AD von, et al. Impact of institutional aspects on breastfeeding for working women: a systematic review. *Ciência & Saúde Coletiva*. 2020 Apr;25(4):1445–62.
6. Pereira-Santos M, Santana M, de S, Oliveira, Nepomuceno Filho DS, Lisboa RA, Almeida CS. LMR, et al. Prevalence and associated factors for early interruption of exclusive breastfeeding: meta-analysis on Brazilian epidemiological studies. *Revista Brasileira de Saúde Materno Infantil*. 2017 Mar;17(1):59–67.
7. Buccini GS, Pérez-Escamilla R, Paulino LM, Araújo CL, Venancio SI. Pacifier use and interruption of exclusive breastfeeding: Systematic review and meta-analysis. *Matern Child Nutr*. 2016 Nov 14;13(3).
8. Pérez-Escamilla R. Breastfeeding and the nutritional transition in the Latin American and Caribbean Region: a success story? *Cadernos de Saúde Pública*. 2003;19:S119–27.
9. Lutter CK, Chaparro CM, Grummer-Strawn LM. Increases in breastfeeding in Latin America and the Caribbean: an analysis of equity. *Health Policy Plan*. 2011 May;26(3):257–65.
10. World Health Organization (WHO). Indicators for assessing infant and young child feeding practices: conclusions of a consensus meeting held 6–8. <https://apps.who.int/nutrition/publications/infantfeeding/9789241596664/en/index.html> (2008). Accessed January 2021.
11. Nguyen PH, Avula R, Headey D, Tran LM, Ruel MT, Menon P. Progress and inequalities in infant and young child feeding practices in India between 2006 and 2016. *Maternal Child Nutrition*. 2018;14(S4):e12663.
12. World Health Organization; Unicef (WHO;UNICEF). Meeting Report. Inter-Agency Technical Consultation on Infant and Young Child Feeding Indicators. <https://www.who.int/publications/m/item/inter-agency-technical-consultation-on-infant-and-young-child-feeding-indicators> (2018). Accessed January 2021.

13. Moraes BA, Gonçalves A, de C, Strada, Gouveia JKR, Moraes HG, BA, Gonçalves A de. C, et al. Factors associated with the interruption of exclusive breastfeeding in infants up to 30 days old. *Rev Gaúcha Enferm.* 2016;37(spe):e2016-0044.
14. World Health Organization (WHO). National Implementation of the Baby-friendly Hospital Initiative. <https://www.globalbreastfeedingcollective.org/national-implementation-baby-friendly-hospital-initiative-2017> (2017). Accessed January 2021.
15. Sinha B, Chowdhury R, Upadhyay RP, Taneja S, Martinez J, Bahl R, et al. Integrated Interventions Delivered in Health Systems, Home, and Community Have the Highest Impact on Breastfeeding Outcomes in Low- and Middle-Income Countries. *J Nutr.* 2017 Nov 1;147(11):2179S-2187S.
16. Barbosa GEF, Pereira JM, Soares MS, Pereira LB, Pinho L, Caldeira AP, et al. Initial difficulties with breastfeeding technique and the impact on duration of exclusive breastfeeding. *Revista Brasileira de Saúde Materno Infantil.* 2018 Sep;18(3):517–26.
17. Wallenborn JT, Perera RA, Wheeler DC, Lu J, Masho SW. Workplace support and breastfeeding duration: The mediating effect of breastfeeding intention and self-efficacy. *Birth.* 2019;46(1):121–8.
18. Hirani SAA, Karmaliani R. The experiences of urban, professional women when combining breastfeeding with paid employment in Karachi, Pakistan: a qualitative study. *Women Birth.* 2013 Jun;26(2):147–51.
19. Monteiro FR, Buccini G dos, Venâncio S, Costa SI THM da. Influência da licença-maternidade sobre a amamentação exclusiva. *Jornal de Pediatria.* 2017 Oct;93(5):475–81.
20. Victora CG, Bahl R, Barros AJD, França GVA, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *The Lancet.* 2016 Jan;30(10017):475–90. 387(.
21. Vilar-Compte M, Teruel G, Flores D, Carroll GJ, Buccini GS, Pérez-Escamilla R. Costing a Maternity Leave Cash Transfer to Support Breastfeeding Among Informally Employed Mexican Women. *Food Nutr Bull.* 2019 Jun;40(2):171–81.
22. Brown CRL, Dodds L, Legge A, Bryanton J, Semenic S. Factors influencing the reasons why mothers stop breastfeeding. *Can J Public Health.* 2014 May 9;105(3):e179-185.
23. Morrison AH, Gentry R, Anderson J. Mothers' Reasons for Early Breastfeeding Cessation: MCN. *The American Journal of Maternal/Child Nursing.* 2019;44(6):325–30.
24. McFadden A, Gavine A, Renfrew MJ, Wade A, Buchanan P, Taylor JL, et al. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev.* 2017 Feb 28;2017(2).
25. McFadden A, Siebelt L, Marshall JL, Gavine A, Girard L-C, Symon A, et al. Counselling interventions to enable women to initiate and continue breastfeeding: a systematic review and meta-analysis. *Int Breastfeed J.* 2019 Oct 21;14(42).
26. World Health Organization; United Nations Children's Fund (WHO;UNICEF). Scorecard data. <https://public.tableau.com/app/profile/gbc2364/viz/Tables2/Dashboard1> (2020). Accessed January 2021.
27. Farfán-García AE, Imdad A, Zhang C, Arias-Guerrero MY, Sánchez-Álvarez NT, Iqbal J, et al. Etiology of acute gastroenteritis among children less than 5 years of age in Bucaramanga, Colombia: A case-control study. *PLoS Negl Trop Dis.* 2020 Jun;14(6):e0008375.
28. Carvalho MJL do, Carvalho N, Santos MF, CR dos, Santos, PT de F, Carvalho, MJL do N, Carvalho MF, et al. First postpartum home visit: a protective strategy for exclusive breastfeeding. *Revista Paulista de Pediatria.* 2018 Mar;36(1):66–73.
29. Schincaglia RM, Oliveira AC de, Sousa LM de, Martins KA. Práticas alimentares e fatores associados à introdução precoce da alimentação complementar entre crianças menores de seis meses na região noroeste de Goiânia. *Epidemiol Serv Saúde.* 2015 Sep;24:465–74.
30. Barbosa GEF, Silva VB da, Pereira JM, Soares MS, Medeiros Filho R dos Pereira A LB, et al. Initial breastfeeding difficulties and association with breast disorders among postpartum women. *Revista Paulista de Pediatria.* 2017 Sep;35(3):265–72.
31. Neves PAR, Gatica-Domínguez G, Rollins NC, Piwoz E, Baker P, Barros AJD, et al. Infant Formula Consumption Is Positively Correlated with Wealth, Within and Between Countries: A Multi-Country Study. *J Nutr.* 2020;01(4):910–7. 150(.
32. Baker P, Santos T, Neves PA, Machado P, Smith J, Piwoz E, et al. First-food systems transformations and the ultra-processing of infant and young child diets: The determinants, dynamics and consequences of the global rise in commercial milk formula consumption. *Maternal Child Nutrition.* 2021;17(2):e13097.
33. Robinson H, Buccini G, Curry L, Perez-Escamilla R. The World Health Organization Code and exclusive breastfeeding in China, India, and Vietnam. *Maternal Child Nutrition.* 2019;15(1):e12685.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Additionalfile1.docx](#)
- [Additionalfile2.docx](#)
- [Additionalfile3.docx](#)
- [Additionalfile4.docx](#)
- [Additionalfile5.docx](#)
- [Additionalfile6.docx](#)
- [Additionalfile7.docx](#)