HEALTH PROMOTION

Cost-Benefit Analysis of Increasing the Exclusive Breastfeeding Rate in Italy

ENRICO URPIS[1], CARMEN TEREANU[1,2]
[1] Department of Medical and Surgical Specialities, Radiological Sciences and Public Health, Università di Brescia, Italy;
[2] Department of Hygiene and Prevention, Risk manager, Agency for Health Protection Bergamo (ATS), Italy

Keywords

Cost • Breast feeding • Otitis media • Gastroenteritis • Respiratory disease

Summary

Introduction. *Exclusive breastfeeding (EBF) is widely regarded as the optimal method for feeding newborns. While existing literature primarily emphasizes the medical benefits, such as enhanced disease resistance and improved health indicators, this paper proposes a conservative cost-saving exercise of exclusive breastfeeding during the first five months of an infant's life.*
Methods. *Based on the EBF rates in Italy for 2019, the last year with data unaffected by the COVID-19 pandemic, we carried-out a conservative cost-saving exercise considering otitis media, gastroenteritis, and respiratory diseases, applying the methodology proposed by Weimer et al. (2001) and Coco (2007). Cost of hospitalization in case of complications or infant death were not included in the analysis.*
Results. *The total savings considering all three simulations combined under different EBF rate scenarios range from a minimum of € 10,5 million (EBF rate of 40%) to a maximum of € 33.7 million (EBF rate of 71%). Moreover, these estimated savings increase when the cost of formula milk is included.*
Conclusion. *Estimates provided in this work are very conservative. Nonetheless, they pointed out important savings due to increasing EBF rates. Policies such as the Baby-Friendly Hospital and the Baby-Friendly Community Initiatives promoted by United Nations International Children's' Emergency Fund and the World Health Organization are valuable tools to improve EBF and we highly recommend their adoption more widely in Italy.*

Introduction

Since the mid-20th century [1], the popularity of formula milk has surged, reaching significant shares in infant feeding. In the most industrialized countries, the percentage of exclusive breastfeeding (EBF) at six months was less than 30%. However, this trend has gradually reversed, and EBF has become more prevalent. This shift is attributable to various factors, including international organizations like United Nations International Children's' Emergency Fund (UNICEF), which disseminated guidelines to increase EBF rates, governments that adopted these recommendations, and individual healthcare providers who implemented national guidelines.
The rationale for promoting EBF is well-founded. Research has demonstrated that EBF is associated with better health outcomes for newborns, even in critical situations such as extremely premature infants [2, 3]. In the short term, EBF is linked to lower rates of diarrhea, respiratory infections, ear infections, bacterial meningitis, urinary tract infections, necrotizing enterocolitis, sudden infant death syndrome, diabetes, ulcerative colitis, lymphomas, allergies, digestive diseases, and otitis media. Additionally, EBF has been shown to enhance cognitive abilities [1].
EBF also benefits maternal health [4]. Studies have observed that EBF is associated with lower rates of ovarian cancer, premenopausal breast cancer, and type 2 diabetes. Furthermore, EBF has been linked to improved cardiovascular health and a reduced incidence of postpartum depression. Notably, mothers who practiced EBF weighed eight kilograms less than other mothers six years postpartum [5].
Given these numerous benefits, it is recommended to practice EBF for the first six months of an infant's life and to continue breastfeeding [6] though not exclusively, for the next eighteen months. In fewer than 5% of cases, breastfeeding is not recommended due to specific maternal conditions such as drug use, chemotherapy, HIV positivity, or other illnesses [7].
Despite the strong recommendations for EBF, many mothers choose not to practice it even when they are able to. The primary reasons for the decline in EBF rates include aggressive marketing by formula milk producers, lack of support from family members, insufficient medical knowledge, and inadequate hospital policies. Additionally, cultural factors, work environments, religious beliefs, and general societal attitudes also play a role.
It is worth noting that the reduction in EBF rates has predominantly affected developed countries. Studies have shown a negative correlation between EBF and development [8]. Additionally, macroeconomic factors such as investments in public health services, the presence of women in parliament, the availability of dairy products, investments in family support, maternity

https://doi.org/10.82082/2421-4248/jpmh2026.67.1.3466

leave policies, and opportunities for part-time work for women all influence EBF rates.
In the past, several studies have illustrated the advantages of increasing EBF rates. Some of these studies performed cost-benefit analyses to investigate the potential impact of higher EBF rates on communities. This approach is essential because focusing solely on the medical aspects does not provide a complete understanding of the phenomenon.
Several international studies have quantified the costs associated with low EBF rates, including works by Weimer (2001) [9], Coco (2007) [10], and Quesada (2020) [8]. In Italy, such studies are limited, and there is a lack of recent field research (Bonati, 1998) [11].
The purpose of this paper is to address this gap. It aims to present EBF rates for 2019, the last year with data unaffected by the COVID-19 pandemic, and to propose a conservative cost-saving exercise, considering otitis media, gastroenteritis, and respiratory diseases.

Methods

The base year for this study is 2019, the last year with available data unaffected by the COVID-19 pandemic. Simulations are based on data concerning newborns in 2019. For other statistics, including medical data (such as morbidity rates) and economic data, 2019 records were used when available. If 2019 data were not available, the closest available data were chosen, with each source, year, and selection rationale specified in detail.
For the simulation, this study applied the methodology proposed by Weimer (2001) [9] and attempted to replicate the study conducted by Coco (2007) [10].
Complications, hospitalizations (except for respiratory diseases) and infant mortality were excluded leading to deliberately conservative estimates.

Otitis Media

Otitis media is an infection that predominantly affects newborns and infants. It is estimated [12] that more than 60% of children under three years old have had this infection at least once, and 25% have had it more than once. Existing databases do not report the exact number of affected infants in Italy or the proportion of those exclusively breastfed (EBF) versus the rest of the population. However, literature indicates that this infection affects fewer infants who are EBF up to six months, approximately 26% [8].
Combining these proportions with the 2019 newborn data in Italy (420,000) and the EBF rate at 4-6 months (23,6%) and considering that 25% [13] of these infants develop the disease compared to 53% among non-EBF infants, an increase in EBF rates would lead to a decrease in the occurrence of otitis media. To analyze the impact of increased EBF rates, we replicate the methodology used by Coco (2007) [10].
This paper first analyzes the direct and indirect costs, estimates them for each case, and finally proposes the overall result.

Direct costs:
- Medical check-up: between € 50 and € 100, with an average value of € 75 assumed for each case, considering only one visit without complications.
- Drug cost: estimated at € 3,27 per treatment.

Indirect costs:
On average, 5,6 working hours are lost per case, with each hour valued at € 17,12, totaling € 95,86.
Additional costs: € 13,95 for babysitting, daycare, trips to the doctor, parking fees, and other related expenses (in this case the values included in Coco, 2007 [10] are implemented; the cost has been actualized to 2019 ($ 15,87) and this value has been converted in euro).
This research includes various costs, both direct and indirect. The cost of therapy is standardized worldwide, allowing us to refer to medical treatments in Italy, considering the cost of the antibiotic amoxicillin and referring to the Italian Society of Paediatric Infectious Diseases tables [12, 14].
The cost of each working hour is calculated based on the gross annual income of € 29,601 [15] and 1,710 working hours per year [16].
It is worth noting that this simulation adopts a conservative approach, assuming each episode of otitis media is successfully treated without further complications requiring additional medical checks, hospitalizations, or stronger drug prescriptions. The total cost of each episode is calculated to be € 189,16.

Gastroenteritis

Gastroenteritis refers to inflammatory episodes of the gastrointestinal tract, causing diarrhea, vomiting, or abdominal cramps. These episodes can have various causes; however, modern literature indicates that Rotavirus is the primary cause in newborns. In this analysis, the authors follow the approach outlined by Weimer (1999) [17]. This simulation focuses on episodes characterized by three or more instances of diarrhea occurring within 24 hours. Additionally, the analysis considers only infants in their first six months, during which scientific literature has found a 29% probability of gastroenteritis in EBF infants compared to a 71% probability in non-EBF infants.

Respiratory Diseases

Respiratory diseases are a significant class of illnesses affecting newborns. Due to their prevalence, scientists have focused on investigating whether different breastfeeding practices impact the incidence of these diseases. A study by the University of Padua found that respiratory diseases were the third most common reason for emergency room visits, accounting for 10% of all visits, and this percentage rose to 25% for more severe cases [18, 19]. According to Quesada et al. (2020) [8], in Spain in 2014, non-EBF newborns had a 37% higher chance of experiencing respiratory diseases compared to 25% for EBF infants. Subsequent studies, including those by Frank et al. (2019) [20] and Pandolfi et al. (2019) [21], also reported higher percentages of respiratory diseases among non-EBF infants.

Given the specific nature of these diseases, the methodology used in previous sections was adapted to include the cost of hospital recovery. Using the number of newborns in Italy, the percentages reported by Quesada [8], and data from the hospital services price list, the authors estimate the direct cost to be € 459 (for ordinary recovery of less than one day) and indirect costs as in the previous simulations.

Direct cost of formula milk

Compared with EBF, formula milk needs the purchase of a product. Considering that at two and a half months a newborn needs at least 150 ml of milk five times a day, in five months (151 days in the shortest scenario, January-May) it will be 113,25 lt. consumed. The preparation of 1 lt of milk requires 132 gr of formula milk.
The closest year it was possible to estimate the price was the 2022 with an average of the price of formula milk equal to 21,76 €/kg [23]. Considering all these data it emerges that the direct cost in formula milk is € 298,43 per newborn in the first 5 months.

Sensitivity analysis

The total robustness of the analysis can be tested via a one-way sensitivity analysis on the most optimistic simulation where EBF is at its maximum of 71%. To do so, it is possible to recreate two opposite scenarios where the incidence of diseases increases or is reduced of 20%. The same applies to the price of formula milk.

Results

In the first row of Tables I, II, and III, the expected number of cases for each disease under study is estimated based on the actual EBF rates at five months of age. These numbers are then multiplied by the estimated cost for each disease, allowing for the calculation of the total costs associated with these diseases during the first months of life for infants in Italy.

Next, different scenarios were hypothesized, characterized by increasing EBF rates up to 71%. This percentage reflects the rate of EBF infants at hospital discharge following delivery [23]. The authors used this upper limit as it represents the maximum percentage observed at any point; typically, this percentage decreases to 65% by the first pediatric screening, usually after the first month.
As illustrated in Table I, if the EBF rate at hospital discharge following delivery were maintained in the subsequent months, the total savings for otitis media alone would amount to € 10.012.349.
Similarly, the gastroenteritis simulation (Tab. II) shows significant cost savings, up to € 15.018.524, if the EBF rate increases to the level observed at hospital discharge.
For respiratory diseases (Tab. III), an increase in the EBF rate would result in substantial cost savings compared to the initial scenario.
The total savings considering all three simulations combined under different EBF rate scenarios range from a minimum of € 10.5 million (EBF rate of 40%) to a maximum of € 33.7 million (EBF rate of 71%).
Finally, Table IV shows that an increase of EBF to the maximum level of 71% would lead to a saving increase of € 56.414.877, if costs of formula milk were considered.
Tables V and VI illustrate the results of the sensitivity analysis. All savings are compared to the initial costs where the EBF has the value of 26%. Scenario A refers to the worst simulation where diseases have an increase of the 20%, as well as the price of formula milk. Whilst scenario B refers to the best simulation where diseases have a decrease of the 20% as well as the price of formula milk.
The results of the sensitivity analysis for the three diseases combined range from € 10,4 million in the worst scenario to € 57 million in the best one.
Similarly, doing the same analysis, the savings from the purchase of the formula milk range from € 49.14 million to € 63,69 million.
Based on our sensitivity forecasts, combined results bring a total amount of savings of 59,51 million in the

Tab. I. Otitis Media Simulation.

% EBF	N. EBF	N. Not EBF	Total cases	Costs	Savings
26%	109.222	310.862	192.062	€ 36.330.524	€ 0
40%	168.034	252.050	175.595	€ 33.215.571	€ 3.114.953
50%	210.042	210.042	163.833	€ 30.990.605	€ 5.339.920
65%	273.055	147.029	146.189	€ 27.653.155	€ 8.677.369
71%	298.260	121.824	139.132	€ 26.318.175	€ 10.012.349

Tab. II. Gastroenteritis Simulation.

% EBF	N. EBF	N. Not EBF	Total cases	Costs	Savings
26%	109.222	310.862	252.386	€ 47.741.424	€ 0
40%	168.034	252.050	227.686	€ 43.068.994	€ 4.672.430
50%	210.042	210.042	210.042	€ 39.731.545	€ 8.009.879
65%	273.055	147.029	183.577	€ 34.725.370	€ 13.016.054
71%	298.260	121.824	172.991	€ 32.722.900	€ 15.018.524

Tab. III. Respiratory Diseases Simulation.

% EBF	N. EBF	N. Not EBF	Total cases	Costs	Savings
26%	109.222	310.862	144.509	€ 66.352.553	€ 0
40%	168.034	252.050	138.628	€ 63.652.158	€ 2.700.395
50%	210.042	210.042	134.427	€ 61.723.305	€ 4.629.248
65%	273.055	147.029	128.126	€ 58.830.025	€ 7.522.528
71%	298.260	121.824	125.605	€ 57.672.713	€ 8.679.840

Tab. IV. Formula milk Simulation.

% EBF	N. EBF	N. Not EBF	Costs	Savings
26%	109.222	310.862	€ 92.770.986	€ 0
40%	168.034	252.050	€ 75.219.638	€ 17.551.348
50%	210.042	210.042	€ 62.683.131	€ 30.087.855
65%	273.055	147.029	€ 43.878.072	€ 48.892.914
71%	298.260	121.824	€ 36.356.108	€ 56.414.877

Tab. V. All diseases sensitivity forecast, when the incidence of diseases is reduced or increases of 20% (scenario A versus scenario B).

Scenarios	N. EBF	N. Not EBF	Costs	Savings
Base	298.260	121.824	€ 116.713.788	€ 33.710.713
A	298.260	121.824	€ 140.056.546	€ 10.367.955
B	298.260	121.824	€ 93.371.030	€ 57.053.471

Tab. VI. Formula milk sensitivity forecast, when the milk formula price is reduced or increases of 20%.

Scenarios	N. EBF	N. Not EBF	Costs	Savings
Base	298.260	121.824	€ 36.356.108	€ 56.414.877
A	298.260	121.824	€ 43.627.330	€ 49.143.656
B	298.260	121.824	€ 29.084.887	€ 63.686.099

worst scenario (A) and € 120,74 million in the best one (scenario B) showing that the economic impact of the increase of EBF to 71% is positive and the only difference is in the magnitude of the positive effect. The robustness analysis shows that the conclusions remained unchanged across all tested scenarios

Discussion

This study conducted a conservative cost-saving exercise, of exclusive breastfeeding (EBF) following methodologies from current scientific literature. Three diseases were included: otitis media, gastroenteritis, and respiratory diseases, considering all babies born in Italy in 2019. The authors estimate that at least € 33.710.713 could be saved if the EBF rate remained constant at 71% (the rate observed when mothers leave the hospital) in the first five months of newborns' lives [23]. In addition, avoided cost of exclusive formula milk would be € 56.414.877.

Studies following the methodology of Weimer (2001) [9] have shown that increasing the EBF rate can significantly reduce costs, sometimes within a short period, even less than a year. In this study, three simulations were conducted for otitis media, gastroenteritis, and respiratory diseases. The simulations began with an EBF rate of 29% and increased to a maximum of 71%. Four different scenarios were estimated for each EBF rate, calculating the presumptive number of cases and the expected incidence rate of each disease, multiplied by the total number of cases in 2019. The total number of expected cases was then multiplied by the costs associated with each disease to estimate the total cost for each scenario. Finally, the estimated savings were calculated by comparing the different scenarios for each EBF rate. For the first two simulations, otitis media and gastroenteritis, a six-month interval was used, the period with the highest morbidity and mortality rates.

These simulations allowed for a conservative cost-saving exercise, estimating the economic savings of increasing the EBF rate in different scenarios. Similar studies conducted in the US in 1998 estimated an expected total savings of $ 3,6 billion [9] Other authors, like Coco (2007) [10], proposed a broader cost-benefit analysis discussing different treatments for otitis media in the US context during 2000 and 2001, directly estimating the costs associated with this disease.

In these studies, data sources varied widely. In Weimer (2001) [9], costs were published by the Agency for Health Care Policy and Research (AHCPR).

The approach proposed by Weimer (2001) [9], is the

first of many studies where the same methodology is adapted to different contexts and data sources. Among these, Quesada et al. (2000) [8], developed four different scenarios: otitis media, gastroenteritis, necrotizing enterocolitis, and respiratory diseases. The context was 2014, and costs were provided by the "Ministerio de Sanidad, Consumo y Bienestar Social," Madrid. Following their analysis, the best scenario estimated savings of € 479.790.646.

Some studies focus on a single disease but analyze the effect of EBF on a sample directly observed by the authors. For instance, Pandolfi et al. (2019) [21], conducted a study based on a pool of 496 patients, all newborns screened at the "Ospedale Bambino Gesù" Children's Hospital in Rome. Analyzing the factors that cause respiratory diseases, they found that the most influential variable in their statistical model (using multivariable logistic regression analysis) was the absence of EBF by the mother.

Two main reasons guided the authors in choosing the methodology for this work. First, in many studies like the work of Weimer (2001) [9], cost estimations in a specific context were already provided by other trusted and well-known institutions. While using such data allows for sophisticated analysis, it also limits the ability to replicate or adapt the research to different contexts. For example, insurance data provided by institutions cannot be modified and must be accepted as they are. Secondly, these studies may raise concerns about the compatibility of various methodologies implemented. As some of the previously cited studies use data from other institutions, comparing them can be challenging or impossible.

In contrast, Coco (2007) [10], proposes a bottom-up approach that considers all parameters in detail, allowing for replication and adaptation of the methodology. Using data from a specific year, it is possible to estimate different values for each simulation, which can then be analyzed in detail.

Due to lack of available data in Italy, morbidity, hospitalization, direct and indirect cost estimations from other countries were used. Despite cost actualization, confounding factors (epidemiologic, services utilization, organizational as well as health policy and national educational and cultural pattern) might influence results and this might be a limitation of this study. Spain and Italy have high cultural affinity and a public healthcare system. The U.S. healthcare system is private insurance-based, with a lot of variability of quality and high costs. All three countries have first level pediatricians, which might influence newborn hospitalization rates while mothers' attitude towards work opportunities after birth delivery might influence costs. Thus, although transferability of EBF cost saving estimation is interesting, it should be cautiously interpreted.

We deliberately excluded complications, hospitalizations (except for respiratory diseases), and infant mortality and assumed that EBF cost is "zero" carrying out a conservative cost estimation, rather than a cost-benefit analysis. The simulation of the savings due to avoidance of exclusive formula milk consumption and the sensitivity forecasts (scenarios A e B) we provide strengthen the validity of our study.

The assumption that EBF cost is "zero" is partially true. In the developed world, breastfeeding is accompanied of several "must-have" products such as like pads, shields, ointment, nursing bras and shirts, pillows, pumps, pump accessories, *etc*. [24] Besides, it is argued that mothers who are breast feeding would need up to 500 extra calories per day [25]. In this framework, the UNICEF and WHO policies to promote EBF like the Baby-Friendly Hospital and the Baby-Friendly Community Initiatives (BFHI and BFCI) are valuable investments. Implementation costs include staff training, policy review and external assessment to achieve UNICEF certification, and depend on the hospital size and technological capacity. Arslanian et al. (2022) estimated BFHI staff training costs in the first year ranging between US$ 7,3-125,4 per birth in the US and between PPP (purchasing power parity) 2,7-6,1 per birth in Mexico [26]. For 1 US$ invested in BFHI implementation, a return on investment of US$49 and AUS$55 were calculated in Indonesia and in Australia respectively [27, 28]. In Italy, the Agency for Health Protection of Bergamo, accredited by UNICEF (in 2017 and renewed in 2023) and active in the BFCI program, successfully increased the EBF rate in 3-month-old babies from 36,6% in 2014 to 64,5% in 2020 [29]. Despite wide consensus on the positive return of the investments in BFHI abroad, no data are available on the implementation cost and the break-even point in Italy, according to our knowledge.

Conclusion

The simulations indicate that increasing the rate of exclusive breastfeeding (EBF) in newborns can lead to significant cost savings. To achieve these savings, the UNICEF and WHO policies BFHI and BFCI should be more widely adopted.

It is important to note that the estimates provided in this work are very conservative and do not include some parameters due to a lack of data. For instance, none of the simulations include the cost of hospitalization in case of complications or infant death. Including such values would make the simulations more accurate; however, the provided results would likely increase in magnitude without altering the final conclusions.

Future research should include these values to provide more precise estimates. Additionally, as more recent data become available from public institutions, updated estimates will be possible. Finally, including more diseases not covered in this study, such as necrotizing enterocolitis, would offer a better representation of the benefits of increasing EBF rates [30, 31].

Acknowledgments

None.

Conflicts of interest statement

Non declared.

Authors' contributions

EU and CT collaborated to the Introduction and Discussion sections. EU set the methodology and carried out the statistical analysis.

References

[1] Stevens EE, Patrick TE, Pickler R. A history of infant feeding. J Perinat Educ 2009;18:32-9. https://doi.org/10.1624/105812409X426314.

[2] Cristofalo EA, Schanler RJ, Blanco CL, Sullivan S, Trawoeger R, Kiechl-Kohlendorfer U, Dudell G, Rechtman DJ, Lee ML, Lucas A, Abrams S. Randomized trial of exclusive human milk versus preterm formula diets in extremely premature infants. J Pediatr 2013;163:1592-5.e1. https://doi.org/10.1016/j.jpeds.2013.07.011.

[3] Abrams SA, Schanler RJ, Lee ML, Rechtman DJ. Greater mortality and morbidity in extremely preterm infants fed a diet containing cow milk protein products. Breastfeeding Med 2014;9:281-5. https://doi.org/10.1089/bfm.2014.0024.

[4] Prentice AM. Breastfeeding in the Modern World. Ann Nutr Metab 2022;78:29-38. https://doi.org/10.1159/000524354.

[5] Sharma AJ, Dee DL, Harden SM. Adherence to breastfeeding guidelines and maternal weight 6 years after delivery. Pediatrics 2014;134:S42-9. https://doi.org/10.1542/peds.2014-0646H.

[6] United Nations Children's Fund (UNICEF). Analytics Section, Division of Data, Research and Policy, and Division of Communication. A Mother's Gift, for Every Child Breastfeeding Report 2018. Available at: https://data.unicef.org/resources/breastfeeding-a-mothers-gift-for-every-child/. Accessed on: 01/11/2024.

[7] Ministero della Salute. Quando l'allattamento materno non è possibile. Available at: https://www.pnrr.salute.gov.it/portale/allattamento/dettaglioContenutiAllattamento.jsp?lingua=italiano&id=5252&area=allattamento&menu=comefare. Accessed on: 01/11/2024.

[8] Quesada JA, Méndez I, Martín-Gil R. The economic benefits of increasing breastfeeding rates in Spain. Int Breastfeed J 2024;15:34. https://doi.org/10.1186/s13006-020-00277-w.

[9] Weimer Jon P. The Economic Benefits Of Breastfeeding: A Review And Analysis, in Food Assistance and Nutrition Research Reports 33813, United States Department of Agriculture, Economic Research Service 2001. Available at: https://ideas.repec.org/p/ags/uersfa/33813.html. Accessed on: 01/11/2024.

[10] Coco AS. Cost-effectiveness analysis of treatment options for acute otitis media. Ann Fam Med 2007;529-38. https://doi.org/10.1370/afm.626.

[11] Bonati M, Vivarelli P, Brunetti M. Il costo economico del non allattamento al seno. Quaderni ACP 1998;6:10-13. Available at: https://aicpam.org/wp-content/uploads/2011/02/costo_non_allatt.pdf. Accessed on: 01/11/2024.

[12] Società Italiana Pediatria, Gestione Dell'otite Media Acuta in Età Pediatrica. Linee Guida, 2019. Available at: https://sip.it/2019/06/17/gestione-otite-media-acuta-linee-guida/. Accessed on 01/11/2024.

[13] Duffy LC, Faden H, Wasielewski R, Wolf J, Krystofik D. Exclusive Breastfeeding Protects Against Bacterial Colonization and Day Care Exposure to Otitis Media. Pediatrics 1997;100:E7. https://doi.org/10.1542/peds.100.4.e7.

[14] Federfarma 2023. Costo Medicinali. Available at: https://www.federfarma.it/Farmaci-e-farmacie/Cerca-un-farmaco.aspx. Accessed on: 25/11/2024.

[15] JP Salary Outlook 2020. L'analisi del mercato retributivo italiano. Available at: https://it.readkong.com/page/jp-salary-outlook-2020-l-analisi-del-mercato-retributivo-6126669. Accessed on: 25/11/2024.

[16] OCSE. Hours worked. Available at: https://data.oecd.org/emp/hours-worked.htm. Accessed on: 01/11/2024.

[17] Weimer Jon P. Breastfeeding: Health and Economic Issues in Food Review/National Food Review, United States Department of Agriculture, Economic Research Service 1999; 22. Available at: https://ideas.repec.org/a/ags/uersfr/266217.html. Accessed on: 01/11/2024.

[18] Sfriso F, Masiero S, Pisetta F. I bambini in Pronto Soccorso… ma è sempre urgenza? Studio osservazionale sugli accessi al PS Pediatrico di Padova. Available at: https://www.sdb.unipd.it/sites/sdb.unipd.it/files/a_SFRISO.pdf. Accessed on: 25/11/2024.

[19] Galeazzo B, Rubin G, Moretti C. Analisi epidemiologica degli accessi per Codice Rosso in Pronto Soccorso Pediatrico, Medico e Bambino pagine elettroniche 2012;15. Available at: https://www.medicoebambino.com/?id=PSR1206_10.html. Accessed on: 25/11/2024.

[20] Frank NM, Lynch KF, Uusitalo U, et al. The relationship between breastfeeding and reported respiratory and gastrointestinal infection rates in young children. BMC Pediatr 2019;19:339. https://doi.org/10.1186/s12887-019-1693-2.

[21] Pandolfi E, Gesualdo F, Rizzo C, Carloni E, Villani A, Concato C, Linardos G, Russo L, Ferretti B, Campagna I, Tozzi A. Breastfeeding and respiratory infections in the first 6 months of life: A case control study. Front Pediatr 2019;7:152. https://doi.org/10.3389/fped.2019.00152.

[22] Prodotti per l'infanzia: Iva ridotta, ma il prezzo scende? Per i seggiolini troppo poco. Available at: https://www.altroconsumo.it/vita-privata-famiglia/mamme-e-bimbi/news/iva-prodotti-infanzia. Accessed on: 26/02/2026.

[23] Quotidiano Sanità. Non cresce la percentuale di mamme italiane che allattano al seno: fino al 6° mese sono solo il 30% e il Sud è fermo al 23,9%. Available at: https://www.quotidianosanita.it/studi-eanalisi/articolo.php?articolo_id=99426#:~:text=Il%2044%25%20dei%20bambini%20risiede,(compimento%20del%20secondo%20mese. Accessed on: 25/11/2024.

[24] Kavin Senapathy. 5 Reasons Breastfeeding Isn't Actually Free, Forbes, 2017. Available at: https://www.forbes.com/sites/kavinsenapathy/2017/03/31/5-reasons-breastmilk-isnt-actually-free/. Accessed on: 09/03/2026.

[25] Mayo Clinic Staff Breastfeeding nutrition: Tips for moms Available at: https://www.mayoclinic.org/healthy-lifestyle/infant-and-toddler-health/in-depth/breastfeeding-nutrition/art-20046912?p=1. Accessed on: 09/03/2026.

[26] Arslanian KJ, Vilar-Compte M, Teruel G, Lozano-Marrufo A, Rhodes EC, Hromi-Fiedler A, García E, Pérez-Escamilla R. How much does it cost to implement the Baby-Friendly Hospital Initiative training step in the United States and Mexico? Plos One 2022;17(9):e0273179. https://doi.org/10.1371/journal.pone.0273179.

[27] Pramono AY, Desborough JL, Smith JP, Bourke S. The Social Value of Implementing the Ten Steps to Successful Breastfeeding in an Indonesian Hospital: A Case Study. Yale J Biol Med 2021;94:429-58. Erratum in: Yale J Biol Med 2022;95:301.

[28] Pramono A, Smith J, Desborough J, Bourke S. Social value of maintaining baby-friendly hospital initiative accreditation in Australia: case study. Int J Equity Health 2021;20:22. https://doi.org/10.1186/s12939-020-01365-3.

[29] Tereanu C, Breda E, Rocca G, et al. Lactancia materna para el desarrollo sostenible. ATS Bérgamo certificado por UNICEF "Comunidad amiga de los niños" para la lactancia, actas de CALASS 2023, Messico. Available at: https://www.alass.

org/wp-content/uploads/17_Tereanu-et-al-es.pdf. Accessed on: 01/11/2024.

[30] Hair AB, Peluso AM, Hawthorne KM, Perez J, Smith DP, Khan JY, O'Donnell A, Powers RJ, Lee ML, Abrams SA. Beyond Necrotizing Enterocolitis Prevention: Improving Outcomes with an Exclusive Human Milk-Based Diet. Breastfeed Med 2016;11:70-4. https://doi.org/10.1089/bfm.2015.0134.

[31] Cristofalo EA, Schanler RJ, Blanco CL, Sullivan S, Trawoeger R, Kiechl-Kohlendorfer U, Dudell G, Rechtman DJ, Lee ML, Lucas A, Abrams S. Randomized trial of exclusive human milk versus preterm formula diets in extremely premature infants. J Pediatr 2013;163:1592-95.e1. https://doi.org/10.1016/j.jpeds.2013.07.011.

Received on December 03, 2024. Accepted on March 12, 2026.

Correspondence: Carmen Tereanu, ATS Bergamo, Department of Hygiene and Prevention, Risk manager, Agency for Health Protection, Via Borgo Palazzo 130, 24125 Bergamo, Italy. E-mail: carmentereanu@gmail.com.

How to cite this article: Urpis E, Tereanu C. The cost-savings of increasing exclusive breastfeeding in Italy. J Prev Med Hyg 2026;67:E58-E64. https://doi.org/10.82082/2421-4248/jpmh2026.67.1.3466