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Monitoring prevalence of breastfeeding and associated factors: results of the 2022 data collection of the Italian surveillance of children aged 0-2 years

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Abstract

Objective. To describe breastfeeding and associated factors in a large representative sample of children aged 0-2 years in Italy.

Materials and methods. Data from the 2022 Italian surveillance of children aged 0-2 years, comprised of 35,550 mothers, were analysed to estimate rates of EBF (exclusive breastfeeding), any breastfeeding (BF) and never breastfed (NBF). Logistic regression was used to investigate the association of EBF, BF and NBF with potential predictors.

Results. EBF among children aged 2-3 months varied from 36.4% in the South Italy to 54.0% in the North, decreasing respectively to 19.6% and 35.8% at 4-5 months. At 12-15 months BF ranged between 29.2% (South) and about 40% (Centre and North). Women with Italian citizenship, having a lower educational level, those who never attended antenatal classes (AC), and those residing in the South were significantly less likely to exclusively breastfeed or to breastfeed after the first year of life of the child.

Conclusions. The data underscore the gap between recommendations and actual breastfeeding practices, offering the first national perspective that highlights territorial disparities. The findings emphasize the need for targeted interventions, particularly in light of identified regional and socio-economic differences.

Key words

- surveillance
- breastfeeding
- exclusive breastfeeding
- health promotion

INTRODUCTION

Breastfeeding (BF) is the normal way to feed the newborn and offers positive implications for both the baby's and the mother's health [1-3]. It is the biological norm, the most sustainable practice [4], and is a right of both mother and child [5].

Based on consolidated evidence, the World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) recommend exclusive breastfeeding (EBF) for the first 6 months of life and, after introducing nutritionally adequate and safe complementary food, continuing BF up to 2 years of life or beyond. In 2003, the World Health Assembly and the UNICEF Executive Board unanimously endorsed the "global strategy for infant and young child feeding" [6]. Subsequently, the "global strategy for women's, children's and adolescents' health" was confirmed, urging member states to adopt and implement national policies and comprehensive, large-scale programs to protect, promote, and support adequate infant and young child feeding, as well as maternal nutrition practices [7].

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Enhancing breastfeeding is a key factor for the achievement of the United Nations' Sustainable Development Goals [8] and constitutes a fundamental component of the nurturing care framework [9]. In 2012, WHO identified six global nutrition targets to be achieved by 2025. One of these objectives is to increase the rate of EBF during the first 6 months to a minimum of 50% [10]. In 2021, a more ambitious target of at least 70% was proposed by WHO and UNICEF [11]. These goals represent a priority for the national health systems, recognizing that BF is one of the most impactful interventions, "providing short-term and long-term health and economic and environmental advantages to children, women, and society" [12].

Despite being a public health and early childhood development (ECD) priority, in 2022, only 46% of infants started breastfeeding within the first hour after birth globally, and 48% of all babies under 6 months of age were exclusively breastfed. At 2 years, 59% of children were still breastfed [13].

The WHO European Region has the lowest prevalence of EBF. In 2006-2012, it was estimated that only 25% of infants were exclusively breastfed for 6 months [14]. This low prevalence is confirmed in other high-income countries [15].

International organizations and communities have undertaken various initiatives to protect, promote and support BF [16]. However, the lack of updated and standardized data, both between and within countries, does not permit appropriate monitoring and comparison of BF practices, nor does it allow for the evaluation of the effectiveness of interventions [17]. Standard indicators to monitor breastfeeding have existed since the 1990s, and the WHO has provided guidance for monitoring BF practices since 2008. In 2021, WHO/UNICEF published an updated guidance providing a set of revised indicators for assessing infant and young child feeding practices, with their definitions and measurement methods [18]. Despite this, full adherence to these standards has not yet been achieved [19]. The need to improve the standard methodology for monitoring and collecting BF data has been recognized as a critical issue [15]. More recently, considering the high number of countries (mostly high-income countries) which have no data on EBF collected according to international standards, WHO/UNICEF, in collaboration with the global breastfeeding collective, have set a target for 75% of countries to report on EBF at least every five years by 2030 [20]. They also call on civil society to take seven actions, one of which is to "strengthen monitoring systems that track the progress of policies, programs, and funding towards achieving both national and global breastfeeding targets" [21]. The World Breastfeeding Trend Initiative (WBTi) process advocates repeat assessment every 3-5 years [22].

In Italy, the protection, promotion, and support of BF is a goal that has been part of the national policies for over 25 years [23, 24]. The Italian National Institute of Statistics collected data in 2000 and 2013 through telephone interviews with women who had given birth during the previous 5 years. The percentage of women who had breastfed, regardless of duration, increased from 81.1% to 85.5% and the average duration of any breastfeeding increased from 6.2 to 8.3 months [25]. From two follow-up studies conducted during 2008-2011 [26] in selected populations, BF and EBF rates were estimated respectively at discharge, at 3 and 6 months (BF rates: 91.6%, 71.6%, 57.7%; EBF rates: 57.2%, 48.6%, 5.5%). Since then, the available estimates of BF seem to be far from WHO/UNICEF goals and show important differences in geographical and social determinants, which need to be addressed to reduce social and health inequalities [27].

In recent years, a national "surveillance system for the main determinants of health in children aged 0-2 years" (surveillance of children aged 0-2 years), promoted by the Ministry of Health and coordinated by the Italian National Institute of Health, (Istituto Superiore di Sanità, ISS) has been implemented.

The surveillance enabled collection of information on breastfeeding according to WHO/UNICEF criteria through sample surveys conducted in the vaccination centers (VCs) in Italian regions.

The previous pilot study, conducted in 13 local health districts (Distretti Sanitari) across six Italian regions between February and November 2015, revealed EBF prevalence rates of 44.4% among infants aged 2-3 months and 25.8% among those aged 4-5 months. In 2015, BF prevalence in the 11-12 months and 13-15 months age groups was 34.2% and 24.9% respectively, while 10.4% of children were never breastfed. Relevant geographical and socio-economic differences were found [28]. The first round of surveillance conducted in 2018-19 across 11 regions showed that the percentage of EBF among children aged 4-5 months was 23.7%, and at 12-15 months BF was 31.3%. The proportion of children who had never been breastfed was 11.7% [29].

The aim of this paper was to measure the prevalence of EBF, BF and never breastfed (NBF) according to WHO/UNICEF criteria using data from the 2022 surveillance of children aged 0-2 years. The paper also aims to assess factors associated with EBF, BF and NBF.

MATERIALS AND METHODS

The population-based surveillance of children aged 0-2 years was based on cross-sectional sample surveys repeated at regular intervals among mother-child pairs recruited during compulsory vaccination appointments in the Italian regions. The target population was mothers of children up to 2 years of age taken to VCs to receive immunizations. Mothers were enrolled in all the VCs of the regions when one of the following vaccine doses was administered to their children: first, second, third dose of mandatory vaccine against Diphtheria, Tetanus and Pertussis (DTP) or hexavalent vaccine (against Diphtheria, Tetanus, Pertussis, Poliomyelitis, *Haemophilus influenzae* type B, and Hepatitis B), and first dose of the vaccine against Measles, Mumps, Rubella, Varicella (MMRV). Four independent samples were selected within each region in correspondence of the four doses administered at approximately ages 2-3 months, 4-5 months, 11-12 months, and 13-15 months according to the Italian vaccination schedule. Data were collected through an anonymous questionnaire

compiled by mothers with the assistance of trained health professionals involved in the administration of the vaccines. The questionnaire collected information on several important determinants of children's health, including breastfeeding. Demographic and socio-economic characteristics of participants were also collected. A more detailed description of the surveillance methodology is reported in *Appendix 1*.

APPENDIX 1

SURVEILLANCE OF CHILDREN AGED 0-2 YEARS

BACKGROUND

The "surveillance system for the main determinants of health in children aged 0-2 years" – surveillance of children aged 0-2 years – is promoted by the Ministry of Health and coordinated by the Italian National Institute of Health (Istituto Superiore di Sanità, ISS, Rome, Italy) in collaboration with the Italian regions. The population-based surveillance was included among those of national and regional relevance identified by the Prime Minister's Decree of 2017 on "registers and surveillance" [1]. The implementation of the surveillance was preceded by a pilot study, promoted and financed by the National Centre for Disease Prevention and Control – Centro Nazionale per la Prevenzione e il Controllo delle Malattie (CCM) – of the Italian Ministry of Health, conducted in 13 selected local health districts of 6 Italian regions in 2014 [2] to test a surveillance system of the main determinants of health in children aged 0-2 years included in the National Programme "GenitoriPiù" [3].

The first round, carried out in 2018-19, involved 11 regions mainly from the South Italy [4]. The second round was conducted in 2022 and involved all of Italy's 21 regions with the exception for the Region of Molise and the autonomous province of Bolzano (the Molise Region had difficulty starting the data collection while the autonomous province of Bolzano was unable to complete it). The Region of Tuscany participated by sharing results of its ongoing maternity care survey.

METHOD

Sample

The surveillance is based on cross-sectional sample surveys repeated at regular intervals among mother-child pairs recruited during compulsory vaccination appointments in the Italian regions. The target population is mothers of children up to 2 years of age taken to vaccination centers (VCs) to receive immunizations. Mothers are enrolled at all the VCs of the regions when one of the following vaccine doses is administered to their children: first, second, third dose of mandatory vaccine against Diphtheria, Tetanus and Pertussis (DTP) or hexavalent vaccine (against Diphtheria, Tetanus, Pertussis, Poliomyelitis, *Haemophilus influenzae* type B, and Hepatitis B), and first dose of the vaccine against Measles, Mumps, Rubella, Varicella (MMRV). Four independent samples are selected within each region in correspondence of the four doses that are administered, according to the Italian vaccination schedule, at approximately ages 2-3 months, 4-5 months, 11-12 months and 13-15 months. A pseudo-random procedure is used to select children: starting at the beginning of the survey period, all eligible children are selected until the desired sample size is reached. Only children accompanied by their mothers are included in the survey. In the case of twins, mothers are requested to provide information only for the first child vaccinated. No other exclusion criteria are applied. The sample sizes are calculated based on an assumed maximum variability of the phenomenon being investigated, with a population proportion set at 50%, a margin of error of either 5% or 3% (depending on the choice of the region) and a confidence level of 95%. Finite population correction is applied because the sample size is relatively large compared to the population size, which is represented by the number of births in the year preceding the survey. The samples are representative of either the region or – with an expanded sample size – of local health units (depending on the choice of the region).

Data collection

Data are collected through an anonymous questionnaire compiled by the mothers with the assistance of trained health professionals involved in administering vaccines. The surveillance collects information on the following health determinants of children starting before conception through the first years of life: folic acid intake before and during pregnancy, tobacco and alcohol consumption during pregnancy and lactation, breastfeeding practices, infant sleep positions, family reading habits, exposure of children to screens (tablet, mobile phone, TV, computer), home and car safety measures, and mother's attitudes towards vaccination. Demographic and socio-economic characteristics of the participants are also collected. The questionnaire undergoes review at each data collection phase, allowing for the inclusion of new survey areas.

The questionnaire, available in multiple languages, can be completed either as a paper survey or online using personal devices such as mobile phones or tablets, or on devices provided by the VC during the waiting periods before or after vaccination sessions. Each mother is interviewed only once; therefore, those who have already participated in a previous vaccination appointment for the same child or another child are excluded. After the interview, all participating or non-participating mothers receive an information leaflet detailing the health determinants in children 0-2 years and their families. Responses to the questionnaires are

acquired through a dedicated platform. The construction of the database, the cleaning of the records, and the subsequent data analysis are carried out centrally by the coordination group.

ETHICS AND PRIVACY

Before data collection, mothers receive an information note with a description of the purpose of the survey. They can decline participation, with operators recording refusal on a designated sheet. After providing verbal consent to participate in the study, mothers receive information about privacy regulations including the processing of their personal data before completing either the digital or paper questionnaire. In accordance with principles of anonymity and privacy, respondents' identity is never disclosed. The surveillance system study protocol and questionnaire were formally approved by the National Ethics Committee for clinical trials of public research bodies of the Italian National Institute of Health (Istituto Superiore di Sanità, ISS) (Prot. n. PRE-4255 - 20/10/2014; Prot. n. PRE-BIO-CE 10939 - 06/04/2018; Prot. n. 0015067 PRE BIO – 19/04/2022).

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The present study used data from the second round of the surveillance, conducted between June and October 2022, involving 35,550 mothers enrolled in all of the 21 Italian regions, except for the Region of Molise and the autonomous province of Bolzano, who did not participate in the surveillance (the Molise Region had difficulty starting the data collection while the autonomous province of Bolzano was unable to complete it), and Region of Tuscany, who shared results of its ongoing maternity care survey. This ensured an adequate representation of the three areas of the country – North, Centre, and South – notoriously characterized by different maternal care outcomes. The response rate was 95.7%, ranging between 89.2% and 98.6% at the regional level. From the overall sample, specific age groups were selected for the analysis of breastfeeding irrespective of the administered vaccine dose (*Table S1, available online as Supplementary Material)*.

Outcome

EBF, BF and NBF were included in the analysis as outcome variables. According to WHO/UNICEF criteria, information on breastfeeding was collected for the previous 24 hours [18]. Children under six months who had only consumed breastmilk were classified as exclusively breastfed (EBF), children who had received breastmilk with other food or liquids, including formula, were classified as breastfed (BF). Participants who had not breastfed in the previous day were asked if they had ever breastfed to identify cases that had never received breastmilk (NBF). EBF under six months was analysed in the 2-3 month and 4-5 month age groups. BF was analysed in the same age groups and, to evaluate continued breastfeeding after the first year of life, among children aged 12-15 months. Age groups were considered as intervals of months completed and corresponded to or approximated those suggested by WHO/UNICEF.

Covariates

The following socio-economic characteristics were included as potential risk factors in accordance with previous studies [21]: mother's age (<30, 30-34, ≥35 years), citizenship (Italian, not Italian), educational level (low, middle school or lower; medium, high school; high, bachelor's degree or higher), perceived economic difficulties (no, some/many), parity (primiparous, multiparous), attendance at an antenatal class (AC) (yes, never), and geographical area of residence (North, Central, and South Italy).

Statistical analysis

Frequency distributions, prevalence rates and odds ratios (ORs) with 95% confidence intervals (CIs) were used to describe data. Percentages were calculated based on cases with available information, excluding missing values.

Frequency distributions by socio-economic characteristics of mothers participating in the study were computed by geographical area of residence. The prevalence rates of EBF and BF stratified by geographical area were calculated at different children's ages while NBF was considered across all age groups 2-15 months.

To show the effect on the estimates of different age distributions of children in the three areas, directed age standardization was applied to EBF and BF prevalence rates based on 10 days' age groups, by using the overall population sampled as a standard. The children's age in the questionnaire was reported in completed months plus days. However, due to a high percentage of missing values regarding the number of days, standardization

could only be conducted for cases where complete age information was available.

Adjusted ORs were estimated through multiple logistic regression models to explore factors associated with the occurrence of EBF at 4-5 months of age, BF at 12-15 months and NBF. Statistical analyses were performed using STATA/SE version 18.0 statistical software.

RESULTS

The socio-economic characteristics of women participating in the study are reported in *Table 1*. Overall, 43.5% of them were aged ≥35 years with no relevant differences across the different geographical areas. Similar to the general population in Italy, the percentage of women with foreign citizenship, as well as that of more-educated women, were higher in the North and the Centre compared to the South. Conversely, women reporting economic difficulties and those who never attended an AC were more prevalent in the South.

The percentage of EBF among children aged 2-3 months varied from 36.4% in the Southern regions to 54.0% in the North (*Table 2*). The percentages decreased at 4-5 months: ranging between 19.6% (South) and 35.8% (North). When considering any BF, the percentage ranged between 63.9% (South) and 77.6% (North) in the 2-3 month age group, and between 52.3% (South) and 67.6% (North) in the 4-5 month age group. Age standardization applied to prevalence calculated among cases where age information was available in completed months plus days had negligible effects as shown by comparing standardized estimates of EBF and BF with unstandardized estimates calculated for the same cases (*Table S2, available online as Supplementary Material*).

Regarding BF over one year of age, about 3 out of 10 children aged 12-15 months in the Southern regions were reported as still receiving breastmilk, whereas in the Centre and the North the figure was about 4 out of 10 (*Table 2*). The percentage of NBF, estimated among children aged 2-15 months, ranged from 10.3% in the Centre to 14.4% in the South. Even for these indicators, standardization had minimal impact on the estimates (*Table S2, available online as Supplementary Material*).

Table 1
Women's characteristics grouped by geographical area of residence

Variables	Geographical area of residence			
	North (N=16,318)	Centre (N=5,820)	South (N=13,412)	Total (N=35,550)
Age				
≤29 years	20.9	19.4	23.3	21.5
30-34 years	36.4	33.8	33.8	35.0
≥35 years	42.8	46.8	42.9	43.5
Missing	*5.9*	*4.8*	*5.3*	*5.5*
Citizenship				
Italian	82.7	84.6	95.3	87.8
Not Italian	17.3	15.4	4.7	12.2
Missing	*5.7*	*4.3*	*4.7*	*5.1*
Educational level*				
Low	13.9	11.6	17.1	14.8
Medium	43.0	42.0	49.7	45.4
High	43.1	46.4	33.2	39.9
Missing	*5.9*	*4.4*	*3.9*	*4.9*
Economic difficulties				
None	70.1	64.4	60.4	65.5
Some/many	29.9	35.6	39.6	34.5
Missing	*5.5*	*4.3*	*3.7*	*4.6*
Parity				
Primiparous	53.9	56.4	53.6	54.2
Multiparous	46.1	43.6	46.4	45.8
Missing	*7.1*	*6.7*	*9.2*	*7.8*
Attendance of an AC				
Never	28.2	33.5	54.1	38.8
Yes	71.8	66.5	45.9	61.2
Missing	*4.6*	*3.6*	*4.0*	*4.2*

AC: antenatal class; *low: middle school or lower; medium: high school; high: bachelor's degree or higher.

Table 2
Prevalence rates of exclusive breastfeeding (EBF), any breastfeeding (BF) and never breastfed (NBF) at different ages by geographical area of residence

Geographical area of residence	Children aged 2-3 months			Children aged 4-5 months			Children aged 12-15 months		Children aged 2-15 months	
		EBF	BF		EBF	BF		BF		NBF
	n	%	%	n	%	%	n	%	n	%
North	3,173	54.0	77.6	5,308	35.8	67.6	4,011	39.6	12,492	11.5
Centre	1,402	48.9	75.1	1,128	32.7	65.1	1,537	40.8	4,067	10.3
South	3,847	36.4	63.9	2,378	19.6	52.3	3,342	29.2	9,567	14.4
Total	8,422	46.7	72.2	8,814	30.0	62.2	8,890	36.2	26,126	12.3

Table 3 shows prevalence rates stratified by socio-economic characteristics and adjusted ORs for three indicators: EBF at 4-5 months, BF at 12-15 months and NBF. Women who were significantly less likely to exclusively breastfeed their children at 4-5 months included those aged ≥35 years (OR=0.73; 95% CI: 0.61-0.86), with Italian citizenship (OR=0.72; 95% CI: 0.59-0.87), having a lower educational level (medium: OR=0.60; 95% CI: 0.52-0.68; low: OR=0.42; 95% CI: 0.34-0.52), reporting economic difficulties (OR=0.79;

Table 3
Prevalences and mutually adjusted odds ratios for the reported variables. Logistic regression models

Variables	Model 1 Exclusive breastfeeding at 4-5 months (Yes *vs* No)				Model 2 Any breastfeeding at 12-15 months (Yes *vs* No)				Model 3 Never breastfed at 2-15 months (Yes *vs* No)			
	N=8,074				N=8,090				N=23,900			
	% EBF	OR	95% CI		% BF	OR	95% CI		% NBF	OR	95% CI	
Age												
≤29 years	27.8	1			32.3	0.84	0.71	0.99	11.7	1		
30-34 years	32.6	0.98	0.83	1.16	37.9	1.08	0.95	1.22	10.8	1.06	0.91	1.22
≥35 years	29.3	0.73	0.61	0.86	36.6	1			13.9	1.52	1.32	1.75
Citizenship												
Not Italian	32.9	1			56.9	1			7.6	1		
Italian	29.7	0.72	0.59	0.87	33.5	0.32	0.27	0.39	13.0	2.28	1.87	2.80
Educational level*												
Low	19.0	0.42	0.34	0.52	35.9	0.85	0.70	1.03	16.8	2.07	1.76	2.43
Medium	25.7	0.60	0.52	0.68	33.0	0.79	0.70	0.90	13.6	1.55	1.37	1.75
High	39.1	1			39.9	1			9.5	1		
Economic difficulties												
None	32.9	1			37.1	1			12.0	1		
Some/many	24.4	0.79	0.69	0.91	34.2	0.91	0.81	1.03	13.1	0.99	0.89	1.10
Parity												
Multiparous	32.9	1			36.9	1			12.6	1		
Primiparous	28.8	0.72	0.64	0.82	35.8	1.00	0.89	1.12	12.1	1.06	0.96	1.18
Attendance of an AC												
Yes	36.0	1			39.0	1			10.4	1		
Never	20.5	0.58	0.51	0.67	31.5	0.70	0.62	0.80	15.5	1.52	1.36	1.71
Geographical area of residence												
North	35.8	1			39.6	1			11.5	1		
Centre	32.7	0.93	0.78	1.12	40.8	1.10	0.95	1.29	10.3	0.82	0.70	0.96
South	19.6	0.57	0.49	0.65	29.2	0.78	0.68	0.88	14.4	0.99	0.89	1.12

AC: antenatal class; EBF: exclusive breastfeeding; BF: any breastfeeding; NBF: never breastfed; *low: middle school or lower; medium: high school; high: bachelor's degree or higher.

95% CI: 0.69-0.91), primiparous women (OR=0.72; 95% CI: 0.64-0.82), those who never attended an AC (OR=0.58; 95% CI: 0.51-0.67), and those residing in Southern Italy (OR=0.57; 95% CI: 0.49-0.65).

Italians (OR=0.32; 95% CI: 0.27-0.39), women who never attended an AC (OR=0.70; 95% CI: 0.62-0.80) and those residing in the South (OR=0.78; 95% CI: 0.68-0.88), along with younger women (OR=0.84; 95% CI: 0.71-0.99), were also significantly less likely to breastfeed at 12-15 months.

Women who were significantly more likely to have never breastfed their children were those aged ≥35 years, with Italian citizenship, having a lower level of education, and those who never attended an AC.

DISCUSSION

This manuscript has introduced, for the first time, breastfeeding prevalence rates calculated on a representative sample of mothers covering almost the entire country in Italy. The surveillance of children aged 0-2 years also provided a comprehensive overview of factors associated with breastfeeding practices.

Collecting data on breastfeeding prevalence through a national system shows multiple strengths. The surveillance data were collected during vaccination appointments, which are scheduled according to the Italian National Vaccination Plan [30]. In 2021, vaccination coverage was 94% for the first dose and 92-94% [31] for the second, making vaccination appointments a strategic, consolidated, and efficient opportunity for collecting data, especially since the proportion of mothers who either do not vaccinate their children or choose to vaccinate with their pediatrician instead a VC, remains low. Moreover, adherence to vaccinations is homogeneous, and less affected by regional variability or the north-south gradient that characterizes other health indicators in pregnancy, childbirth, and early childhood. Utilizing vaccination appointments for data collection emphasizes the integration of health determinants, of which breastfeeding is a part, and highlights the efficiency of leveraging existing healthcare infrastructures for surveillance as a means of sustainability.

Despite recommendations from WHO and other international agencies, exclusive breastfeeding rates in Italy remain below target levels, highlighting regional and socioeconomic disparities. The average prevalence of EBF at 2-3 months in the pool of regions participating in the surveillance is 46.7%, dropping to 30.0% at 4-5 months. This rate appears to align Italy with the levels observed in other European countries, although direct comparisons are challenging due to variations in the timing and methods of data collection [13]. The observed prevalence and duration of exclusive breastfeeding reflect a broader trend of increased adherence to early childhood best practices (such as reading out loud to infants and children, proper sleep positioning, car safety, and protection from alcohol and tobacco) in northern regions compared to southern regions [27]. There is also an issue of missed or denied opportunities for a significant number of mothers, children and fathers/partners, that go beyond mothers' informed choices about breastfeeding.

The profile of mothers – and babies – who breastfeed sub-optimally or do not breastfeed highlights some classic drivers of inequality, such as educational and economic levels and geographic location. Overall, non-Italian mothers are more likely to breastfeed compared with native Italians. As reported by Marchetti *et al.*, this might confirm that the "healthy migrant effect" also applies to breastfeeding practices in Italy and that, "in the absence of substantial policies for the protection, promotion and support of breastfeeding, the "exhausted migrant" effect is to be expected in the coming years" [32].

To improve maternal and child health, targeted interventions are needed at multiple levels. It is essential to implement and expand national breastfeeding protection, promotion and support policies, particularly in regions with lower EBF rates. These policies should include evidence-based awareness programs aimed at mothers, fathers/partner and healthcare providers, with a focus on reducing inequalities. Improving access to antenatal classes which have been confirmed as a positive determinant of breastfeeding [33], along with postnatal support groups (such as peer support groups) and community family services, can help sustain breastfeeding, as can expanding coverage of the Baby-Friendly Hospital and Community Initiatives. Another crucial aspect is enhancing parental leave policies, aligning the length of maternity leave with WHO recommendations to support exclusive breastfeeding for six months. Extending paternity leave – which in Italy currently provides only 10 days – would further encourage fathers' involvement in supporting breastfeeding. The neonatal discharge summaries (NCDs) are another important tool for supporting mothers during breastfeeding. Several studies in the Region of Lazio found that some neonatal discharge summaries (NDSs) reported information on infant feeding practices, but in most cases the prescription of formula for breastfeeding mothers was recommended even with no medical indication [34]. The NDSs are a tool, but not the only one, for supporting mothers during breastfeeding and, for this reason, further efforts to reduce their prescriptive attitudes and level of medicalization is required. Prioritizing these interventions in southern regions, where EBF rates are particularly low, should be a key focus.

The role, whether positive or negative, that the healthcare system can play in influencing the decision to start and continue breastfeeding is well-documented [35]. A study conducted in Italy on the Baby-Friendly Hospital network has demonstrated that a highly-structured, evidence-based care model, performed better in some of the WHO/UNICEF standards during the COVID-19 emergency [36]. Nevertheless the geographical distribution of the Baby-Friendly Initiative in Italy is uneven and predominantly concentrated in the northern regions (https://www.unicef.it/italia-amica-dei-bambini/mappa-italia-amica/), as is the provision of community maternity services (e.g., family care centres) offering AC, post-natal support, and mother-to-mother/parents support groups. In addition, and, considering the crucial role of fathers in supporting and bonding with their child, the 10 days currently allotted at birth are clearly inadequate.

Among the limitations of the surveillance of children aged 0-2 years is the lack of data on breastfeeding initiation. This absence makes it more challenging to speculate on and identify the structural factors that affect the initiation, exclusivity, and duration of breastfeeding. In Italy, a data collection system at birth is mandatory, and the birth register (CeDAP, *certificato di assistenza al parto*) provides population-based routine data [37]. It represents data readily available to assess the implementation of best practices in pregnancy and childbirth. However, while this could be the most efficient and sustainable method to measure the "initiation of breastfeeding" indicator, it presents several significant challenges, as described in previous studies [38]. The first concerns the heterogeneity of the data collection tool, as not all regions have included information on breastfeeding at birth. Additionally, not all regions use WHO/UNICEF standard questions, and, as for the timing of data collection, the information is insufficient for the "early initiation of breastfeeding" and "exclusive breastfeeding for the first 2 days after birth" indicators. Finally, the current CeDAP data collection system at birth does not allow for the construction of a comprehensive indicator of neonatal feeding throughout the entire hospital stay, an indicator used in the accreditation of Baby-Friendly Hospitals, which is coordinated by the Italian National Committee for UNICEF in Italy. As a general recommendation, enhancing the timing of data collection at the point of discharge to capture comprehensive and accurate breastfeeding data, training healthcare personnel to accurately define and report different modes of infant feeding (exclusive breastfeeding, predominant breastfeeding, complementary feeding, and formula feeding), and implementing a procedure for record linkage between different routine data could provide more comprehensive information on breastfeeding indicators and underlying drivers.

The surveillance of children aged 0-2 years is a robust, reliable, and sustainable tool for the estimation of breastfeeding prevalence, however some indicators are not yet being adequately measurable according to standard international time frames [13]. While it respects WHO/UNICEF methodology that involve a 24-hour recall period, because the data collection occurs following the vaccination schedule, the surveillance does not allow for the proper alignment of indicators with all those defined by the WHO/UNICEF [19]. Nevertheless, the availability of breastfeeding data provided by the surveillance – the only source of robust national data – has enabled the inclusion of the exclusive breastfeeding indicator at 4-5 months within the set of perinatal indicators used by the National Observatory of Good Practices on Safety in Healthcare of Italian National Agency for Regional Healthcare Services (AGENAS, *Agenzia Nazionale per i Servizi Sanitari Regionali*) [39].

CONCLUSIONS

The data underscore the gap between recommendations and actual breastfeeding practices, offering the first-ever national perspective, and highlighting territorial disparities. Despite a long-standing commitment to breastfeeding promotion and the implementation of several national policies, breastfeeding prevalence rates remain low, associated with socio-economic and geographical determinants, perpetuating inequalities in future generations [1]. The findings highlight the necessity for targeted, evidence-based interventions, particularly in light of identified regional and socio-economic variations.

While the Italian surveillance system provides valuable insights into breastfeeding practices, there is a clear need for enhancements in data collection and policy support to bridge the gap between recommendations and actual practices. Addressing these gaps, requires a concerted effort from policymakers, healthcare providers, and community support systems to create an environment that fosters breastfeeding, recognizing its foundational role in public health and social equity.

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Surveillance of children aged 0-2 years information

All information on surveillance of children aged 0-2 years can be requested to the principal investigator, Dr. Enrica Pizzi enrica.pizzi@iss.it. For further information, please see https://www.epicentro.iss.it/sorveglianza02anni/.

Ethical approval

The surveillance of children aged 0-2 years study protocol and questionnaire were formally approved by the National Ethics Committee for clinical trials of public research bodies of the Italian National Institute of Health (Istituto Superiore di Sanità – ISS) (Prot. n. PRE-4255 - 20/10/2014; Prot. n. PRE-BIOCE 10939 - 06/04/2018; Prot. n. 0015067 PRE BIO – 19/04/2022).

Authors' contributions

EP, MAS conceptualized and designed the study. MAS analysed the data. EP, MAS, AG, FZ wrote the first draft. SD, LS, EMC critically re-viewed the manuscript. All Authors have revised the manuscript and approved its final version.

Conflicts of interest statement

None of Authors declare competing financial interests.

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