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Cost analysis of planned out-of-hospital births in Italy

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Abstract. *Background and aim:* In Italy, the main birthplace is a hospital, and only a few women choose an out-of-hospital setting. This study assessed the costs related to delivery in different birthplaces in Italy. *Methods:* The cost analysis considered direct and amortizable costs associated with mother-child care in physiological conditions. An analysis of the hospital births considered the Diagnoses-Related Groups 373 and 391. To estimate the cost of the births assisted privately by freelance midwives, an evaluation based on an experts' opinion was carried out. *Results:* Childbirth hospital care in Italy amounts to € 1832.00, and birth in an out-of-hospital setting accredited with the National Health System has a full cost of € 1345.19 in the 'maternity home' and € 909.60 at home. The average cost of the birth in 'private maternity homes' amounted to € 3260.00, while at-home births amounted to € 2910.00. *Conclusions*: Any accreditation of out-of-hospital settings by the NHS would considerably reduce the waste of economic resources compared to hospital childbirth. (www.actabiomedica.it)

Key words: Birth Setting; Birthing Centers; Costs and Cost Analysis; Midwifery

Introduction

Ideally, every woman should be able to give birth in a place that is perceived as safe and guarantees adequate, considerate, and timely perinatal care. A healthy woman with a low-risk pregnancy can comfortably give birth in either an obstetric unit (OU) of a hospital, a small maternity clinic, a birth centre, or at home (1). The latter three are commonly referred to as out-of-hospital birth settings. Several studies have reported that a planned choice of birthplace may influence perinatal outcomes in low-risk women (2–6). Furthermore, women with low-risk pregnancies who plan to give birth in an out-of-hospital setting are less exposed to invasive interventions (such as an episiotomy) and severe morbidity during labour and delivery (7).

The most recent data from Italy regarding care and outcomes of out-of-hospital birth is based on 1099 women who opted for delivery in an out-of-hospital setting from 2014–2018 (7). The authors reported a 9.2% and 11.7% prevalence of postpartum haemorrhage (> 500 mL blood loss) in the freestanding midwifery versus home-birth group, respectively (8). In general, the reported incidence of postpartum haemorrhage-related complications is between 1% and 10% of all deliveries (9). Among those delivering at home, six mothers (for break of stitches) and 19 newborns (five suspected of a brachial plexus injury, five with suspected infection, two with hyperpyrexia, two for jaundice, and five ill-defined cases) were transferred to the hospital within the first week postdelivery. None of the other characteristics related to birth or birth outcomes varied between the two birthplaces (8). Therefore, out-of-hospital births in women with low-risk pregnancies are a potentially safe choice. Nevertheless, the perinatal environment in these places must be monitored, evaluated, and regulated as

per standard healthcare control systems to guarantee the safest and most effective care to a mother and her newborn (8), comparable to a hospital delivery.

Childbirth in an out-of-hospital setting is a widespread practice that is prevalent unevenly throughout the world. In the United States, the percentage of out-of-hospital births in 2017 stood at 1.61% (10), while Australia reported that 2.4% of deliveries were carried out in birth centres, 0.3% at home, and 0.7% in other contexts (11). In Japan, 0.6% of the mothers delivered in birth centres and 0.2% at home (12), while in New Zealand, the incidence of out-of-hospitals was 3.4% nationwide, except for the west coast, where the prevalence reached 10.5% (13). In European countries, the Netherlands is an exception, since about 20% of births occur at home (14), while in England 63% of women give birth in midwife-led birth centres and only 3% give birth at home (15). The prevalence of home births was 2.4% in Wales in 2019 (16), 2.2% in Iceland in 2012 (17), and 1.17% in Scotland (18). Denmark reported a 1–2% incidence; in Sweden 0.7 / 1000, Norway 1.5 / 1000 (19), and Belgium less than 1% in 2017 (20). In Germany, about 2% of births in 2010 took place in an out-of-hospital setting (21), and in France, the reported incidence in 2016 was about 1% (22).

The latest available data (2019) for Italy show that only 0.1% of births took place in out-of-hospital settings, of which 0.03% were referred to as "other" places, and 0.07% deliveries were carried out at home with notable regional variations (23). Despite the low national prevalence of out-of-hospital deliveries, there has been a sharp increase in this trend due to the recent COVID-19 pandemic (24). In addition to the usual hospital OUs and delivery rooms in Italy, women often give birth in midwifery units (MUs) located inside (alongside midwifery units—AMUs) or outside the hospital (freestanding midwifery units—FMUs). Notably, in countries such as Great Britain, the AMUs and FMUs and the services provided therein are borne and managed by the National Health System (NHS). Whereas, in Italy, these facilities are very limited; there are only three AMUs belonging to the NHS placed exclusively in central-northern Italy—in Genoa, Turin, and Florence (7).

On the other hand, there are several groups of freelance midwives who assist the births at private FMUs (translated as 'maternity homes') or at home, whose services are paid for by the couple (7). Accordingly, we aimed to evaluate and compare the costs related to birth in hospital and out-of-hospital settings from the perspective of accreditation to the NHS.

Methods

The analysis was performed using the third-payer perspective (NHS) to estimate the overall cost of the birth in an out-of-hospital environment accredited to the NHS' process, accounting for only the direct costs. Indirect and general costs (including energy, administration, insurance, structure, and depreciation) were not included in the analysis owing to their high variability. The direct cost estimation was initiated by identifying the goods used for each birth and the related unit prices.

To assess the frequency of use of the necessary tools in cases of complications requiring possible transfer to the hospital, we used the incidence rates described in the literature. This included the use of the Metergoline and Flebocortid drugs (reserved for cases of postpartum haemorrhage or 1–10% of all deliveries (9)), local anaesthetics used for repair of perineal trauma, which affects 10.9% of the births (25), anti-D immunoglobulins required in 16% of pregnancies (26), and the use of disposable catheters in cases of postpartum urinary retention, which occur in 0.05% to 37% of all cases (27). Additionally, we incorporated the use of materials required to cope with neonatal emergencies, including an emergency hypothermia blanket for transfer to hospital and a paediatric bag valve mask, which is required in 5% of births (28). For the estimation of direct costs, we used the frequency of access.

The operator time, which is one of highest-priced factors, was estimated considering a maximum time of 12 hours for labour-delivery and 2 hours of postpartum observation requiring 2 midwifery personnel per shift, 22 hours of observation in the puerperium with 1 midwifery personnel for birth in the maternity home, with a total of 24 hours of observation from birth as per the World Health Organisation's (WHO) recommendations (29). Six hours for home visits in the puerperium were also provided, which included 1–2

visits per day about care needs in the first 4–5 days after birth and 1 visit between the 6th and 10th day after childbirth, with 1 midwife.

Regarding the cost of assets for repeated use, the 'lifetime of the individual' asset was estimated by identifying a likely depreciation based on the assumption of 300 births per year for childbirth in a maternity home and 100 births per year for home births. The estimation of the useful life of an asset, which refers to the deprecation rate, is based on the experience gained with similar assets (30).

In Italy, as per the current national rates recognized for childbirth, the remuneration of acute hospital activities is based on the Diagnosis Related Groups (DRG, homogeneous groupings of diagnosis) classification system, which is used as a reference to indicate the hospitalization services to be assigned at predetermined rates (31). The DRG model allows for the identification of different categories of hospital admissions that have similar clinical characteristics and require homogeneous volumes of hospital resources for their treatment (32). In the case of low-risk hospital birth, we used the DRG 373 category – "spontaneous birth without complicating diagnoses" and the DRG 391 "normal new-born".

Since there is no standard tariff for the cost of birth in private maternity homes and at home, an evaluation based on expert opinions was carried out. Two freelance midwives were involved to explain the costs; accordingly, two scenarios were outlined and the average overall cost was computed.

Results

Using the process analysis, we found that births in out-of-hospital settings accredited to the NHS incur a total cost of €1042.27 in maternity homes (Table 1) and €707,20 at home (Table 2).

The total direct costs related to maternity home births is €1021.80, of which €20.47 are related to reusable costs. Assuming that the indirect and general costs account for 30% of the direct costs, the full cost would be €1354.95.

As anticipated, we observed that the time-operator item assumes the greatest weight among the total direct cost, amounting to €900.00. Specifically, the hourly rate of the National Collective Workers Agreement in force, i.e., about €12/h, was taken as a reference, to which 26% equal to the average indemnity was added, making up an amount of €15/h. Among the costs of depreciable assets, the heaviest weights are attributed to the furnishings (estimated time to wear 20 years) and the labour tub (estimated lifetime of 10 years) whose depreciation rates are €7.63 and €10.67, respectively.

The total direct costs related to home birth equals to €667.80, while the quota related to reusable costs amounts to €39.40. Assuming that a share of the indirect and general costs is equal to 30% of direct costs, in this case, the full cost would be €919.36. Like the maternity home births, the greatest weight of the direct costs in home births is also attributable to the operator-time item, equal to €570.00 accounting for all the previously mentioned elements. However, this cost is considerably lower than that related to births at a maternity home, since there is no 24-hour observation period following the delivery. Among the costs of depreciable assets, the greatest weights are attributable to the use of a company car (depreciation rate = €15.00) and its maintenance (€1492.00 per year), the depreciation rate of which is €14.92.

Currently, the DRG 373 allows an all-inclusive rate of €1,272.00 for "spontaneous birth without complicating diagnoses" while DRG 391 provides a rate of €560.00 for the "normal infant". These rates are also applied in NHS-accredited MUs. Therefore, we inferred how much care to the mother-child dyad costed in physiological conditions by adding both DRGs, which resulted in a total cost of €1832.00.

Calculating the average of the overall cost was done starting from an evaluation based on experts' opinion, which envisaged the involvement of two freelance midwives, from which 2 scenarios were outlined. Therefore, the average cost of the birth event carried out in private maternity homes managed by freelance midwives equals to €3260.00, while at home birth amounts to €2910.00 if the distance is < 40 km; otherwise, a surcharge is applicable, which averages to €400.00 (Table 3).

Specifically, scenario 1 describes a 'package of services' with an all-inclusive price of €2500.00 for birth

Table 1. Direct costs and depreciable good costs – BIRTH AT MATERNITY HOME

Direct Costs	Price in Euro	Quantity for single service	Price in euro for single service
Assistance material:	**Total: 279,1**		**Total: 34,15**
Sterile latex gloves in different sizes (1 pair)	1,00	3	3,00
Non-sterile gloves (100 pieces)	3,00	20	0,60
Sterile gauze (1 kg)	8,00	500 gr	4,00
Surgical drapes 100x100 (10 pcs)	17,00	3	5,10
Collector bag	2,00	1	2,00
Cannula needles n 16G - 18G - 21G (3 packs of 20 pieces)	4,50	1	0,075
Butterfly n 18G - 21G (100 pieces)	4,00	2	0,08
5 and 10 cc syringes (10 pieces)	2,00 / 3,00	2	1,00
Disposable catheters (10 pieces)	30,00	0.05% - 37% of births	11,1
Band-aid adhesive 10 meters x 10 cm	3,60	10x50cm	0,20
Infusion set	1,00	1	1,00
Suture Threads (36 pieces)	200,00	1	6,00
Medicines:	**Total: 96,99**		**Total: 23,63**
1000/1500 ml physiological saline	2,30	2	4,60
Oxytocin (Syntocinon 1 box)	3,10	1	3,10
Metergoline (Methergin 1 box)	2,94	10% of births	0,29
Flebocortid ampoules	3,50	10% of births	0,04
Local anaesthetics: Carbocaine or Xylocaine or 2% lidocaine in ampoules	3,20	10.9% of births	0,35
Disinfectant 500cc	5,00	1	5,00
Anti-D immune globulin (if needed)	57,95	16% of births	9,27
Antibiotic eye drops (10 single doses)	8,00	1	0,80
Vitamin K drops (6 ml)	11,00	0,1 ml	0,18
Neonatal care material:	**Total: 73,15**		**Total: 6,02**
Tubes for funicular sampling	0,40	2	0,80
Cord-clamps (50 pieces)	17,00	1	0,34
Emergency Hypothermia blanket	30,00	5% of births	1,5
Paediatric bag valve mask (n 1)	19,60	5% of births	0,98
Blood Lancet (100 pieces)	4,00	1	0,40
New-born screening card	Data not found	1	Data not found

Disposable baby diapers	0,50	4	2,00
Time-operator	15 euros/h (12 euros/h Rate recorded by the current National Collective Labour Agreement. + 26% average allowance	46 hours N = 2 midwives 14 hours (labour / delivery / postpartum) N = 1 midwife 22 hours (puerperium) 10 hours N = 1 midwife (About 6 home visits)	900,00
Full day food	11,00	2	22,00
Paediatric home visit (ticket rate)	36,00	1	36,00
			Total: 1021,80

Depreciable goods costs	**Price in Euro**	**Estimated time to wear (years)**	**Depreciation (Estimated over 300 annual births)**
Assistance material	**Total: 216,57**		**Total: 0,0756**
Thermometer	6,00	5	0,004
Phonendoscope and sphygmomanometer	160,00	10	0,053
Medical tourniquet	5,00	5	0,003
2 Kocher	14,00	10	0,004
1 straight scissors with blunt tips	3,50	10	0,002
1 bowl for disinfectant	8,60	10	0,003
Pliers Foerster	11,50	10	0,004
1 needle holder	6,08	10	0,002
1 tissue pliers anatomical	1,89	10	0,0006
Sonicaid	750,00	10	0,25
Autoclave	1500,00	10	0,5
Furnishings for living room, clinic, 2 labour-delivery rooms, kitchen, fire-fighting system, emergency trolley, changing table with baby bath	45.800,00	20	7,63
Waste disposal	200,00	1	0,66
Linen	900,00	5	0,59
Labour-delivery tub	32.000,00	10	10,67
Crib	150,00	5	0,10
			Total: 20,47

Table 2. Direct costs and depreciable good costs – HOME BIRTH

Direct costs	Price in Euro	Quantity for single service	Price in euro for single service
Assistance material:	**Total: 279,1**		**Total: 34,15**
Sterile latex gloves in different sizes (1 pair)	1,00	3	3,00
Non-sterile gloves (100 pieces)	3,00	20	0,60
Sterile gauze (1 kg)	8,00	500 gr	4,00
Surgical drapes 100x100 (10 pcs)	17,00	3	5,10
Collector bag	2,00	1	2,00
Cannula needles n 16G - 18G - 21G (3 packs of 20 pieces)	4,50	1	0,075
Butterfly n 18G - 21G (100 pieces)	4,00	2	0,08
5 and 10 cc syringes. (10 pieces)	2,00 / 3,00	2	1,00
Disposable catheters (10 pieces)	30,00	0.05% - 37% of births	11,1
Band-aid adhesive 10 meters x 10 cm	3,60	10x50cm	0,20
Infusion set	1,00	1	1,00
Suture Threads (36 pieces)	200,00	1	6,00
Medicines:	**Total: 96,99**		**Total: 23,63**
1000/1500 ml physiological saline	2,30	2	4,60
Oxytocin (Syntocinon 1 box)	3,10	1	3,10
Metergoline (Methergin 1 box)	2,94	10% of births	0,29
Flebocortid ampoules	3,50	10% of births	0,04
Local anaesthetics: Carbocaine or Xylocaine or 2% lidocaine in ampoules.	3,20	10.9% of births	0,35
Disinfectant 500cc	5,00	1	5,00
Anti-RH IMMUNOGLOBULINS (if needed)	57,95	16% of births	9,27
Antibiotic eye drops (10 single doses)	8,00	1	0,80
Vitamin K in drops (6 ml)	11,00	0,1 ml	0,18
Neonatal care material:	**Total: 73,15**		**Total: 4,02**
Tubes for funicular sampling	0,40	2	0,80
Cord-clamps (50 pieces)	17,00	1	0,34
Emergency Hypothermia blanket	30,00	5% of births	1,5

Paediatric bag valve mask (n 1)	19,60	5% of births	0,98
Blood Lancet (100 pieces)	4,00	1	0,40
New-born screening card	Data not found	1	Data not found
Time-operator	15 euros / h (12 euros / h Rate recorded by the current National Collective Labour Agreement. + 26% average allowance	24 hours N = 2 midwives 14 hours (labour / delivery / postpartum) 10 hours N=1 midwife (About 6 home visits)	570,00
Paediatric home visit (ticket rate)	36,00	1	36,00
			Total: 667,80

Depreciable goods costs	**Price in Euro**	**Estimated time to wear (years)**	**Depreciation (Estimated over 100 annual births)**
Assistance material	**Total: 216,57**		**Total: 0,227**
Thermometer	6,00	5	0,012
Phonendoscope and sphygmomanometer	160,00	10	0,16
Tourniquet	5,00	5	0,01
2 Kocher	14,00	10	0,014
1 pair of straight blunt-tipped scissors	3,50	10	0,003
1 bowl for disinfectant	8,60	10	0,009
Ring pliers	11,50	10	0,011
1 needle holder	6,08	10	0,002
1 anatomic forceps	1,89	10	0,006
Sonicaid	750,00	10	0,75
Autoclave	1500,00	10	1,5
Waste disposal	200,00	1	2,00
Linen	100	5	5,00
Company car	15000,00	10	15,00
Company car maintenance	1492,00	1	14,92
			Total: 39,40

Table 3. Costs of out-of-hospital deliveries in a private regime

	Maternity home	Home	Surcharge distance >40 km
Scenario 1/ Midwife 1	2500,00 euros The price includes maternity home contribution; visits from on-call at the time of delivery; 24-hour availability of 2 midwives from 37 weeks; N = 5 - 6 home visits in the puerperium; and n. 1 visit at the maternity home.	2200,00 euros The price includes visits from availability to the time of delivery; 24-hour availability, 2 midwives from 37 weeks; n = 5-6 home visits in the puerperium; and n = 1 visit at the maternity home.	500,00 euros
Scenario 2/ Midwife 2	3720,00 euros 3400.00 euros, including maternity home contribution; visits from on-call at the time of delivery; availability h24 of n.2 midwives from 37 weeks. + 320.00 euros home visits in the puerperium (average 8 home visits costing 40 euros each)	3320,00 euros 3000.00 euros, including visits from on-call to the time of delivery; availability h24 of n.2 midwives from 37 weeks. + 320.00 euros home visits in the puerperium (average 8 home visits costing 40 euros each)	300,00 euros
Paediatric visit	150,00 euros	150,00 euros	
Total cost average	**3260,00 euros**	**2910,00 euros**	**3310,00 euros**

in a maternity home, and a €2200.00 package which includes visits from the moment of availability until delivery, 24-hour availability from two midwives from the 37th week of gestation, childbirth care by two midwives, 5–6 home visits in the puerperium, and one visit at the maternity home.

On the other hand, scenario no. 2 described an assistance package up to childbirth with an all-inclusive price of €3400.00 for birth in a maternity home and €3000.00 for home birth, which includes all visits from availability to the birth, 24-hour availability of two midwives from the 37th week and childbirth care by two midwives. Home visits in the puerperium costed around €40.00 each, which assumed an average of 8 visits, amounting to a total of €320.00 while determining the total cost. If the distance from the home is > 40 km, an average surcharge of €400 is applied. In both cases, the paediatric visit has a separate cost, estimated at a maximum of €150.00.

Discussion

Since the clinical characteristics and volume of resources per treatment are homogeneous, and therefore comparable, the overall cost obtained from the sum of the tariffs provided for by DRGs 373 and 391 can be compared with the estimated values from the cost-analysis of the "out-of-hospital birth accredited to the NHS". We found that the total cost associated with birth in a maternity home was lower than the sum of the aforementioned DRG rates for childbirth and neonatal care by a significant 26.04%. Likewise, the total cost associated with home births is 49.82% lower than the sum of the DRG tariffs.

A similar comparative analysis carried out in 2008 took into consideration the costs and related average reimbursements according to the DRG prices of spontaneous hospital births without complications in nine European countries (33). They reported that the cost of hospital birth varied from €342.00 in Hungary to €2365.00 in Germany, with an average of about €1260.00 for the nine countries. The reported average reimbursement of the DRG tariff is €1286.11.

These results concur with the existing literature; a comparative economic analysis of care paths for low-risk women showed that MUs are cheaper and advantageous in terms of cost-effectiveness compared to the 'classic OU' (34). Schroeder et al. (2011) reported that the total cost incurred by pregnant women

without any risk factors during labour at the start of care approximated to: OU or hospital delivery room: £1,511 (€1679.13), AMUs: £1,427 (€1585.78), FMUs: £1,405 (€1561.33), and home: £1,027 (€1141.27) (35). All cost differences were negative even after adjusting costs for confounders, asymmetry, and weight in the dataset, and reflected the cost-saving effect of planned delivery in out-of-hospital birth settings (35). Furthermore, a recent systematic review reported that cost savings associated with out-of-hospital delivery ranged from 3% to 28%, depending on the location, health system characteristics, and methods of delivery analyses used (36). Another recent Australian study described a significant reduction in the use of resources by health services in cases where low-risk births occurred at home or in MUs (37).

At present, the only Italian cities where childbirth care in out-of-hospital settings is provided free of charge are Turin, Reggio Emilia, Modena, and Parma because accreditation to the NHS is envisaged here (38). In some regions, it is possible to request a reimbursement to partially cover the expenses incurred: the Piedmont region provides a maximum amount of €930.00 (39); the Emilia-Romagna region repays 80% of the documented expenditure up to a maximum of €1231.61 (40); the Marche region provides up to €1200.00 (41); the provinces of Bolzano and Trento offer €516.46 (42) and €750.00 (43), respectively, and Lazio provides a €800.00 reimbursement (44). It is reasonable to think that increasing the reimbursement amount would further increase the request for out-of-hospital birth. Many couples who cannot afford this expense do not even consider this a real possibility; consequently, there are left to choose hospital births, where the costs are covered by the NHS.

An additional barrier to choosing an out-of-hospital birthplace is posed by the national regulations in force, which do not provide clear information but refer to purely regional provisions.

Certain Italian regions have issued protocols, guidelines, and care profiles to outline the conditions and requirements necessary to ensure adequate levels of safety. Specifically, the Lazio region adopted a care protocol in 2016 for out-of-hospital births in birth centres and maternity homes (45). In 2003, the Piedmont region defined the care profile in the case of out-of-hospital physiological labour and delivery (46), while Emilia-Romagna published the guidelines on low-risk childbirth care in out-of-hospital settings in 2019 (21). Also, the National Cultural Association of Midwives-Home Birth and Maternity Home published updated guidelines in 2017 for physiological childbirth care at home and maternity homes (47). Nevertheless, a care package aimed at guaranteeing quality, safety, and appropriateness, which is oriented towards the promotion of mother-infant health, should take into consideration NHS accreditation for each type of birthplace.

Despite its many important strengths and findings, this study has some limitations. First, we did not account for the indirect and general costs while estimating the overall cost of "birth in an out-of-hospital environment accredited to the NHS," as it was not possible to know the exact amount. This latter is very variable depending on the context that is taken as a reference. Therefore, an estimate of these costs was based on the general assumption that they equal 30% of direct costs. Furthermore, to estimate the cost of the birth managed by freelance midwives, an evaluation based on expert opinion was carried out involving two midwives, assuming they represented the entire national scenario.

Since such comprehensive data were not available, future studies should focus on these variables.

Despite these limitations, to the best of our knowledge, this is the first study to provide an estimate of the costs of out-of-hospital birth in the Italian context.

Conclusions

A possible NHS accreditation of maternity homes would help reduce the expenditure of economic resources compared to childbirth in a hospital setting. Additionally, the non-economical aspect is associated with contributing to the 'de-medicalisation' of the birth event in Italy and a consequently greater satisfaction during the delivery. It is often reported that the medicalisation of pregnancy and childbirth has negatively impacted the level of satisfaction among pregnant women and couples (48,49). Furthermore, the

continuity of care guaranteed by a midwife during the postnatal period may help achieve long-term benefits for the health of the mother and child, including an increase in the breastfeeding prevalence (50). In fact, the latter is sometimes undermined by inappropriate hospital practices (e.g., prescription of artificial infant formula) and/or poor knowledge, attitudes, and practices by healthcare professionals on infant feeding (51–53).

Finally, the opportunity to access out-of-hospital birthplaces accredited by the NHS would offer alternative affordable options to women and couples with low incomes, thereby reducing health inequalities and ascertaining their freedom to go for private care. This may also have significant social ramifications, leading to further enhancement in midwifery, for instance, providing the opportunity to deploy professional intramural activities.

Therefore, the accreditation of maternity homes may help harmonize the process around international policies, as well as promote and boost the development of midwifery-led care services as an appropriate and efficient model.

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References

1. Safe Motherhood. Care in Normal Birth: A Practical Guide: Report of a Technical Working Group. Department of Reproductive Health & Research, World Health Organization 1996. Geneva.
2. Olsen O. Meta-analysis of the Safety of Home Birth. BIRTH 1997;(24):4-13. doi: 10.1111/j.1523-536x.1997.tb00330.x.
3. Olsen O, Clausen JA. Planned hospital birth versus planned home birth. Cochrane Database of Sistematic Reviews 2012; Issue 9. doi: 10.1002/14651858.CD000352.pub2.
4. Bolten N, Jonge A, Zwagerman E, et al. Effect of planned place of birth on obstetric interventions and maternal outcomes among low-risk women: a cohort study in the Netherlands. BMC Pregnancy and Childbirth 2016; 16,329. doi:10.1186/s12884-016-1130-6.
5. Northern Region Perinatal Mortality Survey Coordinating Group. Collaborative survey ofperinatal loss in planned and unplanned home births. BMJ 1996;313:1306-9. doi:10.1136/bmj.313.7068.1306.
6. Janssen PA, Saxell L, Page LA, Klein MC, Liston RM, Lee SK. Outcomes of planned home birth with registered midwife versus planned hospital birth with midwife or physician. CMAJ 2009;181 (6-7) 377-383. doi:10.1503/cmaj.081869.
7. Colaceci S, Cicero RV, Reali L, et al. Il parto extra-ospedaliero: un'indagine quanti-qualitativa presso una casa maternità di Roma. Quaderni acp 2021; 6: 258-262.
8. Campiotti M, Campi R, Zanetti M, Olivieri P, Faggianelli A, Bonati M. Low-Risk Planned Out-of-Hospital Births: Characteristics and Perinatal Outcomes in Different Italian Birth Settings. Int J Environ Res Public Health 2020 Apr; 17(8): 2718. Published online 2020 Apr 15. doi: 10.3390/ijerph17082718.
9. Escobar MF, Nassar AH, Theron G, et al. FIGO Safe Motherhood and Newborn Health Committee. FIGO recommendations on the management of postpartum hemorrhage 2022. Int J Gynaecol Obstet 2022 Mar;157 Suppl 1:3-50. doi: 10.1002/ijgo.14116.
10. MacDorman MF, Declercq E. Trends and state variations in out-of-hospital births in the United States, 2004-2017. *Birth* 2018;00:1-10. doi: 10.1111/birt.12411.
11. Australian Institute of Health and Welfare 2019. Australia's mothers and babies - 2017. Aviable from https://www.aihw.gov.au/getmedia/2a0c22a2-ba27-4ba0-ad47-ebbe51854cd6/aihw-per-100-in-brief.pdf.aspx?inline=true.
12. Japanese Nursing Association. Midwifery in Japan 2018. Aviable from: https://www.nurse.or.jp/jna/english/midwifery/pdf/mij2018.pdf.
13. Ministry of Health, New Zeland Government 2019. Report on Maternity 2017. Aviable from: https://www.health.govt.nz/system/files/documents/publications/report-maternity-2017-may19.pdf.
14. Zielinski R, Ackerson K, Kane-Low L. Planned home birth: benefits, risks, and opportunities. International Journal of Women's Health. 2015;7:361-377. doi: 10.2147/IJWH.S55561.
15. CareQuality Commission, National statistics, NHS 2020. 2019 Survey of women's experiences of maternity care: Statistical release. Aviable from: https://www.cqc.org.uk/sites/default/files/20200128_mat19_statisticalrelease.pdf.
16. Government Wales 2020. Maternity and Birth Statistics, Wales 2019. Aviable from: https://gov.wales/sites/default/files/statistics-and-research/2020-08/maternity-and-birth-statistics-2019-updated.pdf.

17. Gottfredsdottir H, Magnúsdóttir H, Hálfdánsdóttir B. Home birth constructed as a safe choice in Iceland: A content analysis on Icelandic media. ELSEVIER - Sexual & Reproductive Healthcare 2015; 6, 138-144. doi:10.1016/j.srhc.2015.05.004.
18. Ross-Davie M, on behalf of the Models of care Sub-Group, Scottish Government Review of Maternity and Neonatal Services. The evidence relating to place of maternity care including place of birth 2019. Available from: https://blogs.gov.scot/child-maternal-health/wp-content/uploads/sites/14/2019/03/Place-of-birth-evidence.pdf.
19. Blix E, Kumle MH, Ingversen K, et al. Transfers to hospital in planned home birth in four Nordic countries – a prospective cohort study. Acta Obstet Gynecol Scand 2016; 95:420-428. doi: 10.1111/aogs.12858.
20. Vermeulen J, Luyben A, Buyl R, et al. The state of professionalisation of midwifery in Belgium: A discussion paper. ELSEVIER - Women and Birth 2021;34(1):7-13. doi: 10.1016/j.wombi.2020.09.012.
21. Commissione consultiva tecnico-scientifica sul percorso nascita. Linee di indirizzo per l'assistenza al travaglio e parto fisiologico in ambiente extra-ospedaliero. Bologna: Regione Emilia-Romagna. Ultimo aggiornamento – Settembre 2021.
22. Combier E, Roussot A, Chabernaud J-L, Cottenet J, Rozenberg P, Quantin C. Out-of-maternity deliveries in France: A nationwide population-based study. PLoS ONE 2020;15(2). doi:10.1371/journal.pone.0228785.
23. Ministero della Salute - Direzione Generale della digitalizzazione, del sistema informativo sanitario e della Statistica Ufficio di Statistica. 2021. Certificato di assistenza al parto (CeDAP) Analisi dell'evento nascita - Anno 2019. Aviable from: https://www.salute.gov.it/imgs/C_17_pubblicazioni_3076_allegato.pdf.
24. Società Italiana di Neonatologia. Parto in casa: trend in aumento a causa della pandemia, 2020. Aviable from: https://www.sin-neonatologia.it/wp-content/uploads/2020/06/CS-SIN-parto-in-casa-06.06.2020.pdf.
25. National Institute for Health and Care Excellence. Intrapartum care for healthy women and babies. 2014, 12 3 (Last updated: 21 February 2017). Aviable from: https://www.nice.org.uk/guidance/cg190/chapter/recommendations.
26. Qureshi H, Massey E, Kirwan D, et al. BCSH guideline for the use of anti-D immunoglobulin for the prevention of haemolytic disease of the fetus and newborn. Transfusion Medicine, British Blood Transfusion Society 2014. doi:10.1111/tme.12091.
27. Nusee Z, Mohamed Nor NH, A. Rashid AR, Ismail H, Zakaria H. Overt and Covert Postpartum Urinary Retention, Risk Factors and Complications. European Journal of Medical and Health Sciences 2020, 2(4). doi:10.24018/ejmed.2020.2.4.391.
28. Madar J, Roehr CC, Ainsworth S, et al. European Resuscitation Council Guidelines 2021: Newborn resuscitation and support of transition of infants at birth Published by Elsevier B.V. March 24, 2021. doi: 10.1016/j.resuscitation.2021.02.014.
29. World Health Organization. WHO recommendations on Postnatal care of the mother and newborn. October 2013. Aviable from: https://apps.who.int/iris/bitstream/handle/10665/97603/9789241506649_eng.pdf;jsessionid=14CF8560D2A98D936C5AA3FED8F9C247?Sequence=1.
30. Kimmel PD, Weygandt JJ, Kieso DE. Accounting Tools for Business Decision Making. Wiley 2011.
31. Ministero della Salute. Principali caratteristiche DRG. 15/05/2009, ultimo aggiornamento 30/12/2020. Aviable from: http://www.salute.gov.it/portale/temi/p2_6.jsp?Lingua=italiano&id=1349&area=ricoveriospedalieri&menu=vuoto+.
32. Ministero della Salute. Glossario. 7/02/2013, ultimo aggiornamento: 31/08/2015. Aviable from: http://www.salute.gov.it/portale/temi/p2_6.jsp?Lingua=italiano&id=3669&area=ricoveriospedalieri&menu=vuoto.
33. Bellager MM, Or Z. What can we learn from a cross-country comparison of the costs of child delivery? Health Economics 2008;17(S1), S47–S57. Doi: 10.1002/hec.1325.
34. Rocca-Ihenacho L, Batinelli L, Thaels E, Rayment J, Newburn M, McCourt C. Standard Europei per le Midwifery Units, 2018 (G. M.-I. Traduzione Italiana del 2020 a cura di Batinelli L., Ed.) Milano.
35. Schroeder E, Petrou S, Hollowell J, Redshaw M, Brocklehurst P. Birthplace cost-effectiveness analysis of planned place of birth: decision analytic model. Birthplace in England research programme. Final report part 7. NIHR Service Delivery and Organisation programme; 2014. Aviable from: https://www.npeu.ox.ac.uk/assets/downloads/birthplace/Birthplace_Report_7_-_Birthplace_cost-effectiveness_analysis_of_planned_place_of_birth_decision_analytic_modelling.pdf.
36. Scarf V, Catling C, Viney R, Homer C. Costing Alternative Birth Settings for Women at Low Risk of Complications: A Systematic Review. Plos ONE 2016; 11(2): e0149463. Doi:10.1371/journal.pone.0149463.
37. Callander EJ, Bull C, Mclnness R, Toohill J. The opportunity costs of birth in Australia: Hospital resource savings for a post– COVID-19 era. Birth 2021;00:1-9. Doi:10.1111/birt.12538.
38. Associazione Nazionale Culturale Ostetriche Parto a Domicilio e Casa Maternità. Nascere in casa si può. Aviable from: http://www.nascereacasa.it.
39. Italia, Regione Piemonte. Deliberazione della Giunta Regionale 7 maggio 2002, n. 80-5989. Modalità di accesso e rimborsi per le prestazioni accessorie a favore degli uremici cronici, per il parto a domicilio e per l'ossigenoterapia iperbarica. Bollettino Ufficiale n.20 del 16/05/2002.
40. Italia. Regione Emilia-Romagna. Legge Regionale 11 agosto 1998, n. 26. Norme per il parto nelle strutture ospedaliere, nelle case di maternità e a domicilio. Bollettino Ufficiale n. 104 del 14 agosto 1998.
41. Italia. Regione Marche. Legge Regionale 27 luglio 1998, n.22. Diritti della partoriente, del nuovo nato e del bambino spedalizzato. B.u.r. 4 agosto 1998, n.66.

42. D.G.P. n. 3322/24.09.2001. (n.d.). Rimborso delle spese di ostetricia sostenute per il parto a domicilio - Linee guida ed assegnazioni alle Aziende Sanitarie. Bolzano.
43. Azienda Provinciale Per I Servizi Sanitari, Provincia Autonoma di Trento - Osservatorio Epidemiologico, Direzione Promozione ed Educazione alla salute. 2007. Il parto a domicilio in provincia di Trento - Trend e caratteristiche materno-infantili - Anni 2000-2005. Aviable from: https://www.epicentro.iss.it/territorio/trento/pdf/Report_partodomicilio_2000_05.pdf.
44. Italia. Regione Lazio. Decreto del Commissario ad Acta 12 maggio 2014, n.U00152. Rete per la Salute della Donna, della Coppia e del Bambino: ridefinizione e riordino delle funzioni e delle attività dei Consultori Familiari regionali. Tariffa per il rimborso del Parto a domicilio ad integrazione del Decreto del Presidente in qualità di Commissario ad Acta n.U0029 del 1/04/2011. Bollettino Ufficiale della Regione Lazio 22/05/2014, n. 41, supplemento n.1.
45. Italia. Regione Lazio. Decreto del Commissario ad Acta 23 dicembre 2016, n. U00395. "Protocollo assistenziale per il parto a domicilio in Centro Nascita ed in Casa Maternità. Regione Lazio", redatto ed approvato dal Gruppo di Lavoro Regionale Tecnico Parti a Domicilio ed in Casa di Maternità, istituito con Det. N. G09667 del 4/8/2015 e Det. N. G11586 del 28/9/2015. Bollettino Ufficiale della Regione Lazio 29/12/2016, n.104, supplemento n.1.
46. Regione Piemonte. Profilo assistenziale per l'assistenza al travaglio e parto fisiologico extra-ospedaliero, 2003. Aviamble from: https://www.regione.piemonte.it/web/sites/default/files/media/documenti/2018-11/assistenza_travaglio_parto_extraospedaliero_0.pdf.
47. Nascere in casa - Associazione Nazionale Culturale Ostetriche Parto a Domicilio e Casa Maternità. Linee guida di assistenza al travaglio e parto fisiologico a domicilio e in casa maternità, 1991 - Ultima revisione: maggio 2017. Aviable from: http://www.nascereacasa.it/lineeguida_revisione2017/.
48. Anderson G, Zega M, D'Agostino F, et al. Meta-Synthesis of the Needs of Women Cared for by Midwives During Childbirth in Hospitals. J Obstet Gynecol Neonatal Nurs 2021; Jan;50(1):6-19. Doi:10.1016/j.jogn.2020.10.005.
49. Colaceci S, Corsi E, Berardi F, Coscarella P, Mariotti M, Ramacciati N. Maternal Satisfaction and Birth: a web-based survey. Prof Inferm 2020; 73(3):181-187. Doi:10.7429/pi.2020.733181.
50. Menichini D, Zambri F, Govoni L, et al. Breastfeeding promotion and support: a quality improvement study. Ann Ist Super Sanita 2021; 57(2):161-166. Doi: 10.4415/ANN_21_02_08.
51. Colaceci S, Chapin EM, Zambri F, et al. Verba volant, scripta manent: breastfeeding information and health messages provided to parents in the neonatal discharge summary in the Lazio Region, Italy. Ann Ist Super Sanita 2020; 56(2):142-149. Doi: 10.4415/ANN_20_02_03.
52. Cernigliaro A, Palmeri S, Casuccio A, Scondotto S, Restivo V; In Primis Working Group. Association of the Individual and Context Inequalities on the Breastfeeding: A Study from the Sicily Region. Int J Environ Res Public Health 2019;16(19):3514. Doi: 10.3390/ijerph16193514.
53. Colaceci S, Zambri F, D'Amore C, et al. Long-Term Effectiveness of an E-Learning Program in Improving Health Care Professionals' Attitudes and Practices on Breastfeeding: A 1-Year Follow-Up Study. Breastfeed Med 2020 Apr;15(4):254-260. doi: 10.1089/bfm.2019.0203.

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