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Characteristics of out-of-hospital births and perinatal outcomes: data from the Lazio Region, Italy, cross-sectional study from 2019 to 2021

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Abstract

Introduction. In Italy, the primary place of birth is typically a hospital, with only a small number of women opting for an out-of-hospital setting. This study details the characteristics of midwifery care and perinatal and maternal outcomes of women who gave birth in an out-of-hospital setting in the Lazio Region, Italy, from 2019 to 2021.

Methods. A cross-sectional study was carried out. The study population included 542 healthy low-risk women who completed the process of planning an out-of-hospital birth, and excluding transfers, this resulted in a total sample of 478 women who gave birth out-of-hospital. Descriptive and inferential analyses and also a logistic regression model were performed.

Results. The main outcomes of the out-of-hospital deliveries were: intact perineum in 38.9% of cases, two cases of 3rd degree laceration (0.4%) and in one case (0.2%) episiotomy. Intrapartum emergencies occurred in 85 out of 478 women (17.8%) but only 10 women required a transfer to hospital after delivery. The one minute Apgar score was equal to or greater than 7 in 99.2% of cases. Exclusive breastfeeding of 96% one week after birth and 94.6% one month. Furthermore, having a previous vaginal hospital birth (adjOR 9.7; CI 95% 4.33-21.68 $P<0.001$) and a previous out-of-hospital birth (adjOR 24.2; CI 95% 3.23-181.48 $P=0.002$) was associated with the continuation of out-of-hospital birth.

Conclusions. For low-risk pregnant women who have planned an out-of-hospital birth, it has been shown to be a safe, adequate, appropriate, and effective alternative.

Key words
- birth setting
- birthing centres
- home birth
- midwifery
- out-of-hospital birth

INTRODUCTION

In recent years, in Italy, there has been an increase in the frequency of births occurring outside the hospital setting (at home or in maternity homes). Despite the national prevalence remaining low, the trend in 2020 and 2021 has shown an increase which may be due to the COVID-19 pandemic [1]. Between 2018 and 2022, the rate of out-of-hospital births increased by 87.5% (from 0.08% to 0.15%) [2, 3]. Specifically, the latest available data show that 0.04% of births occurred in "other" locations, with 0.11% occurring at home, with significant regional variations [3].

Globally, the practice of delivering out-of-hospital varies widely. The number of home births in the United States rose from 1.26% in 2020 to 1.41% in 2021 [4]. In Australia, 2% of births occurred in birth centres, 0.5% at home, and 0.7% in other contexts [5]. In Japan, 0.6% of births occurred in birth centres and 0.2% at home. In New Zealand, out-of-hospital births accounted for 3.4% of all births nationwide [6].

Among the European countries the Netherlands is an exception, with approximately 20% of births occurring at home, while in England, 63% of women give birth in midwifery-led birth centres (located either inside or out-

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side hospitals) and 3% deliver at home. The prevalence of home births was 2.4% in Wales in 2019 and 2.2% in Iceland in 2012 [6]. Home births made up 1.4% of births in Scotland [7], between 1% and 2% in Denmark, 0.7 per 1,000 (0.07%) in Sweden, 1.5 per 1,000 (0.15%) in Norway, and less than 1% in Belgium in 2017. In Germany, approximately 2% of births took place outside of a hospital setting in 2010, while in France, the percentage was less than 1% in 2016 [6].

According to the World Health Organization (WHO), every woman should give birth in a place that is perceived as safe and capable of providing adequate, respectful, and timely care. For women with low-risk pregnancies, this place can be not only a hospital obstetrical unit (OU) but also a midwifery clinic, a birth centre, or their own home [8]. Additionally, the National Institute for Health and Care Excellence (NICE) [9] supports the idea that women who meet the criteria for low-risk pregnancies should be supported and encouraged to give birth at home or in midwifery-led birth centres. These settings offer a higher likelihood of spontaneous birth without unnecessary invasive interventions compared to hospitals, which are associated with a higher likelihood of interventions such as vacuum or forceps-assisted births, episiotomies, and caesarean sections (CS). Furthermore, there are no significant differences in neonatal health outcomes related to the planned place of birth in various settings [9]. The literature widely demonstrates that among low-risk pregnant women, the planned choice of birth setting has a minimal impact on adverse perinatal outcomes [10, 11]. Additionally, low-risk women who plan to deliver out-of-hospital are less exposed to invasive interventions (e.g., episiotomy, etc.) and severe morbidity during labour and delivery [12].

The American College of Nurse-Midwives supports home birth as a safe option for women who are essentially healthy at term with a singleton fetus, as the health outcomes for women and newborns from studies have been comparable or better than births that occur in the hospital [13]. Similar statements are supported by the Royal College of Obstetricians and Gynaecologists, and the Royal College of Midwives in a joint statement, emphasising a higher level of satisfaction with the birth experience for those who have chosen home birth [14]. The Australian College of Midwives also advocates home birth as a safe option for women with uncomplicated pregnancies [15].

In Italy, in addition to hospital OU delivery rooms, it is possible to choose to give birth in midwifery units (MUs) located inside or outside of hospitals, at private freestanding midwifery units (FMUs or maternity homes) managed by independent midwives, as well as at home. The services offered by MUs are part of the National Health Service (NHS), following a model similar to that adopted in Great Britain. In Italy, the established MUs are concentrated in the central-northern regions. There are three midwifery units inside hospitals recognised by the NHS located in Turin, Florence and Genoa; however, the Genoa unit has been closed since 2020. Additionally, various groups of independent midwives are actively involved in assisting births at private maternity homes and/or at home, with the costs being borne by the couple [12].

To our knowledge, there is only one Italian study on the midwifery care and maternal-neonatal outcomes of out-of-hospital births. The study included 1,099 women who chose to give birth outside of the hospital between 2014 and 2018, and illustrates that out-of-hospital birth can be considered a safe choice for women with low-risk pregnancies [16]. However, it is important that this option is adequately planned, monitored, regulated, and evaluated through healthcare control systems to ensure safe and effective care for both the mother and the newborn, as is done in hospitals [16].

Therefore, due to a lack of sound evidence from Italy and with the intention of implementing a surveillance system in the near future, a quantitative study was conducted with the aim of describing the characteristics of midwifery care and perinatal and maternal outcomes of women who gave birth in an out-of-hospital setting in the Lazio Region, Italy.

METHODS

Design

A cross-sectional study was carried out.

Participants and settings

Women eligible for out-of-hospital birth, in general, must meet the criteria for low obstetric risk. The women taken into consideration are all those who have sought the out-of-hospital birth at maternity homes and/or independent midwives. The professionals follow the selection criteria outlined in the national coordination guidelines and in the care protocol adopted by Lazio Region [17, 18]. Therefore, the study population was based on the physiological requirements, to be identified and met during pregnancy (e.g., absence of maternal and/or fetal pathology, absence of pregnancy-related conditions, single pregnancy, etc.) and at the onset of labor (single cephalic presentation, full-term pregnancy, normal fetal weight, premature rupture of the membranes <24 hours, regular fetal heart rate, normal maternal blood pressure, and temperature) [17, 18].

The study population was examined in the three-year period 2019-2021.

The inclusion criteria were:

- women who completed the process of planning an out-of-hospital birth (n=542).

The exclusion criteria were:

- women who decided not to have an out-of-hospital birth;
- women who had planned an out-of-hospital birth but changed their decision during pregnancy for all the analyses (n=36);
- women who required transfer to a hospital before delivery for the analysis of out-of-hospital birth, neonatal outcomes, and the postpartum period (n=64).

The final total sample included 478 women who gave birth at home or in a maternity home (*Figure 1*).

Study instrument and data collection

An online form, including literature-based variables was built by three trained researcher midwives and was

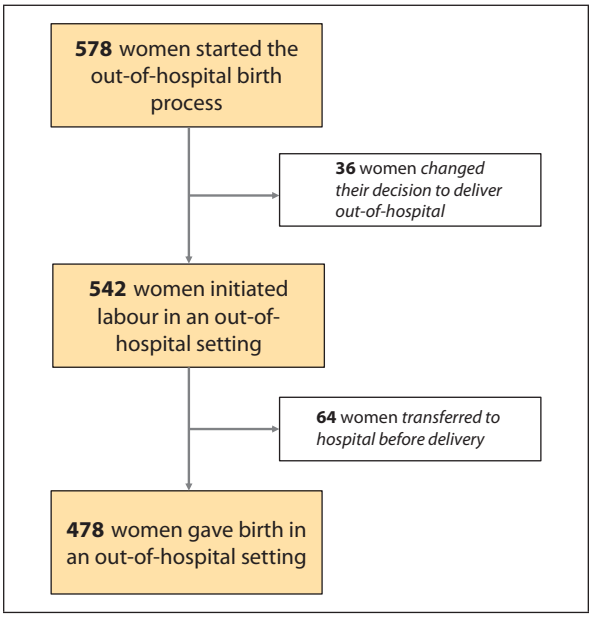

Figure 1
Flow diagram of study population in the Lazio Region, Italy.

approved by a committee of independent midwives of Lazio Region which supported and disseminated the project.

The form was divided into four sections: socio-demographic characteristics, medical history and pregnancy, labour and delivery, and neonatal outcomes and post-partum period.

Thirty independent midwives, working in home or maternity home care settings in the Lazio Region, were trained to fill in the online form. Local coordination was established to ensure comprehensive data collection by the independent midwives.

Data analysis

Descriptive and inferential analyses were performed. The frequency and percentage of socio-demographic characteristics, medical history and prenatal care were determined.

A logistic regression was performed to analyze the factors associated with the continuation of out-of-hospital birth compared to those who had to discontinue the process.

Adjusted odds ratio (adjOR) and 95% confidence intervals (CI) were calculated.

The analyses were performed using STATA version 17 (StataCorp LP, College Station, TX, USA).

Ethical considerations

The design of the study was approved by the Ethics Committee of UniCamillus – Saint Camillus International University of Health and Medical Sciences, Rome, Italy. The midwives and the mothers were informed and agreed to the use of their anonymous data in accordance with Italian and European data protection legislation. No funding was received for this study. This manuscript was prepared in accordance with STROBE guidelines for observational studies [19].

RESULTS

In the years of the study period, 124 (21.5%) women in 2019, 174 (30.1%) in 2020, and 280 (48.4%) in 2021, totaling 578 women initiated the out-of-hospital birth process. Of these, 36 decided not to continue the process due to the onset of medical conditions that did not allow continuation; therefore, they were not included in the study. Among the remaining 542 women who initiated labour in the out-of-hospital setting, 64 were transferred to hospital due to the onset of obstetric risk conditions. A total of 478 women experienced labour and delivery in the out-of-hospital setting (*Figure 1*). Of these, 10 were transferred to hospital after completing the delivery.

Social and obstetric maternal characteristics (n=542 women)

Of the 542 women who initiated labour out-of-hospital, 87.0% were Italian, 70.5% had a university degree or higher education, and 79.3% were employed. The average age of the sample was 34.0 (standard deviation, SD±4.4) years.

About 61.3% of the women were multiparous, of whom 22.2% had chosen an out-of-hospital birth for their previous deliveries, and 10.8% had a history of CS. The median gestational age at the beginning of care by independent midwives was 26.0 (IQR 16-32) weeks, and the average number of visits during pregnancy with the chosen midwives was 5.9 (SD±2.9).

Birth settings and outcomes (n=542 women)

The average gestational age was 39.6 (SD±1.1) weeks. Transfer to a hospital or clinic pre-labour or during the first stage of labour was necessary in 64 cases (*Table 1*). In another 4 cases (0.7%), ambulance intervention was required, but no transfer was needed.

The principal reasons for transfer were: prolonged first or second stage of labour (n=25), fetal complications (n=14), and post-partum complications (n=8). After the transfer, the independent midwife stayed with the woman in 45 cases.

The prevalence of vaginal delivery was 94.1%. Among the 34 women who had a previous CS and attempted a vaginal birth (VBACs), 30 gave birth vaginally, 3 had a repeat CS, and one had an operative birth following transfer to the hospital.

Out-of-hospital births: characteristics (n=478 women)

Of the 478 women who gave birth in an out-of-hospital setting, 45.3% delivered in their own home and 54.7% in a maternity home. About 98% of the women had at least one support companion of the mother's choice with them during labour and birth.

In 73.4% of cases women used a birthing pool during labour, 48.7% of whom also delivered in the birthing pool (*Table 2*). In 3.6% of cases, the placenta was subsequently delivered in the pool. Almost 95% of the women gave birth in a position of their own free choice. The perineum remained intact in 38.9% of women. An episiotomy was performed in one of 478 cases (0.2%). Among the spontaneous tears, 43.5% were first-degree tears, and 17.0%

Table 1
Birth setting and outcomes for the 542 women who initiated labour in an out-of-hospital setting

BIRTH SETTINGS AND OUTCOMES	n	%
Out-of-hospital birth		
Yes	478	88.2
No	64	11.8
Place of birth		
Home	216	39.9
Maternity house	262	48.3
Hospital	61	11.3
Clinic	3	0.6
Mode of delivery		
Spontaneous vaginal birth	510	94.1
Operative delivery	6	1.1
Caesarean section	26	4.8
Mode of delivery for attempted VBACs		
Spontaneous vaginal birth	30	88.2
Operative delivery	1	2.9
Caesarean section	3	8.8
Gestational age at birth (weeks)	mean 39.6 (SD±1.1)	
Transfer to hospital or clinic		
Yes	74	13.6
No	464	85.6
No, but ambulance request	4	0.7
Timing of transfer		
Pre-labour	10	13.5
Prodromal stage	14	18.9
Active labour	32	43.2
Second stage	8	10.8
Third stage	7	9.5
Immediate postpartum	3	4.1
Reasons for transfer		
Prolonged 1st or 2nd stage of labour	25	34.7
Fetal complications	14	19.4
Post-partum complications	8	11.1
Other	25	34.8
Presence of the freelance midwife in the hospital		
Yes	45	60.8
No	29	39.2

SD: standard deviation.

were second-degree tears. There were 2 cases (0.4%) of third-degree tears. Intrapartum emergencies occurred in 85 out of the 478 women who laboured and delivered in an out-of-hospital setting (17.8%). The most frequent emergency was maternal haemorrhage (n=47; 9.8%), including 38 cases (80.9%) with blood loss between 500 and 1,000 ml and 9 cases (19.1%) with blood loss over 1,000 ml. Other emergencies included 18 cases (3.8%)

Table 2
Characteristics of out-of-hospital births (478 women)

BIRTH CHARACTERISTICS	n	%
Immersion in water		
Labour	351	73.4
Delivery	233	48.7
Placenta delivery	17	3.6
Delivery position		
Reclining	26	5.4
On all fours	168	35.2
Squatting	156	32.6
Other	128	26.8
Perineal outcomes		
Intact perineum	186	38.9
1st degree tear	208	43.5
2nd degree tear	81	17.0
3rd degree tear	2	0.4
4th degree tear	0	0.0
Episiotomy	1	0.2
Intrapartum emergencies		
Abnormal fetal heart rate	3	0.6
Malpresentation	9	1.9
Shoulder dystocia	14	2.9
Umbilical cord prolapse	0	0.0
Meconium-stained amniotic fluid	18	3.8
Haemorrhage	47	9.8
>500cc to 1,000cc	38	80.9
>1,000cc	9	19.1
Other	9	1.9
NEONATAL CHARACTERISTICS		
Apgar score at 1 minute	mean 9 (SD±0.8)	
≥7	474	99.2
Apgar score at 5 minutes	mean 9.9 (SD±0.4)	
≥7	477	99.8
≥9	471	98.6
Umbilical cord clamping		
Immediate	2	0.4
After 1 minute, before placenta delivery	19	4.0
After placenta delivery, within 12 hours	342	71.6
After 12 hours, before spontaneous detachment	76	15.9
Lotus birth	39	8.2
Stimulation/resuscitation interventions on the newborn		
None, or tactile stimulation only (rubbing, drying, massage)	464	97.1
Resuscitation with bag and mask ventilation or laryngeal mask	13	2.7

Continues

Table 2
Continued

Advanced resuscitation maneuvers (intubation, chest compressions, medications)	1	0.2
Skin to skin		
No	1	0.2
≤2 hours	36	7.5
>2 hours	441	92.3
Early initiation of breastfeeding		
Within 30 minutes of birth	305	63.8
After 30 minutes and within 2 hours of birth	157	32.9
After 2 hours	12	2.5
Non-breastfeeding	4	0.8
POSTNATAL PERIOD		
Concerns addressed		
Breastfeeding	100	20.9
Laceration/suturing	26	5.4
Urinary incontinence	13	2.7
Neonatal care	8	1.7
Other	34	7.1
Breastfeeding at 7 days		
Exclusive	459	96.0
Predominant	9	1.9
Complementary	8	1.7
Non-breastfeeding - formula feeding only	2	0.4
Breastfeeding at 1 month		
Exclusive	452	94.6
Predominant	11	2.3
Complementary	9	1.9
Non-breastfeeding – formula feeding only	6	1.3

SD: standard deviation.

of meconium-stained amniotic fluid, 14 cases (2.9%) of shoulder dystocia, 9 cases (1.9%) of abnormal presentation, 3 cases (0.6%) of fetal heart rate abnormalities, 6 cases (1.2%) of uterine atony, 1 case (0.2%) of placental abruption, 1 case (0.2%) of tight nuchal cord, and 1 case (0.2%) of umbilical cord rupture.

Neonatal characteristics of the out-of-hospital births (n=478 babies)

The average birth weight was 3,429.3 (SD±4.1) g. The one minute Apgar score was 7 or above in 99.2% of cases (*Table 2*).

Cord clamping occurred after placental delivery in 95.6% of newborns, including 8.2% of cases where lotus birth was chosen. There were 2 cases (0.4%) of immediate cord clamping, one involving a newborn requiring ventilation and one involving cord rupture immediately after delivery.

No airway suctioning was performed for 462 newborns (96.7%) and no tactile stimulation was needed for 464 newborns (97.1%). However, 13 newborns required bag and mask ventilation despite having an Apgar score of 7 or above at 5 minutes. One case required neonatal cardiopulmonary resuscitation due to shoulder dystocia, and was followed by transfer to hospital.

Immediate skin-to-skin contact after birth occurred in 99.8% of mother-baby pairs. The duration of skin-to-skin contact was over 2 hours in 92.3% of cases. The first breastfeeding latch occurred within 2 hours of birth in 96.7% of newborns. Most of newborns (95.2%) had their first bath after 24 hours from birth. In most cases (71%), the first paediatric visit occurred after 6 hours from birth.

Postnatal period (n=478 women)

Seven women were transferred to a hospital or clinic during third stage, due to a retained placenta, and 3 women were transferred in the postpartum period (*Table 1*).

The average number of postpartum visits by independent midwife was 6.0 (SD±2.0), with the last visit occurring between 30 and 42 days after birth in 40.1% of cases.

149 women (31.1%) experienced post-birth issues that required attention. The most common difficulties were related to breastfeeding (20.9%). In 5.4% of cases problems with lacerations and perineal healing were reported, and 2.7% of women had issues of incontinence (*Table 2*).

About 96% of women were exclusively breastfeeding at one week post-delivery, and 94.6% were exclusively breastfeeding at one month.

Logistic regression model

The logistic regression model showed that, compared to primiparous, multiparous who had a previous spontaneous hospital birth (adjOR 9.7; CI 95% 4.33-21.68 $P<0.001$) and women who had a previous out-of-hospital birth (adjOR 24.2; CI 95% 3.23-181.48 $P=0.002$) were associated with the continuation of out-of-hospital birth. The socio-demographic characteristics (education, citizenship, age, marital status) and having had a previous caesarean section were not significantly associated with out-of-hospital birth *(Table 3)*.

DISCUSSION

This is the second study reporting data on out-of-hospital births in Italy and the first that is representative of the Lazio Region. Similar to the first Italian study, the results appear representative for the low-risk pregnant women and confirm that the choice of giving birth outside the hospital is safe for this population [16].

Our regional data show a progressive annual increase in the number of out-of-hospital births, probably due to the COVID-19 pandemic. In fact, many studies have reported that the pandemic has led women to change the chosen place of delivery to ensure their desired birthing experience and to avoid the risk of exposure to COVID-19 during a hospital stay [20-22].

The average age, the high level of education (bachelor's degree and higher), and occupational status are in line with the national study on out-of-hospital births [16] and the international literature [23, 24].

Table 3
Effect of parity on the continuation of out-of-hospital birth (542 women) – logistic regression model

Variable	% (n/tot)	adjOR*	CI (95%)	*P*
Primiparous	76.7 (161/210)	1		
Multiparous with previous in hospital caesarean section	80.7 (25/31)	1.5	0.57-4.06	0.4
Multiparous with previous vaginal hospital birth	96.5 (219/227)	9.7	4.33-21.68	**0.000**
Multiparous with previous out-of-hospital birth	98.7 (73/74)	24.2	3.23-181.48	**0.002**

*Adjusted for education, citizenship, age, marital status.
adjOR: adjusted odds ratio. CI: confidence interval.

Consistent with the literature, multiparity is associated with out-of-hospital births [16]. Among multiparous women who chose the out-of-hospital setting for previous births, it is common to observe a continuation of this choice for subsequent deliveries. Additionally, based on national data from 2014-2018, 4.3% of women birthing out-of-hospital had a previous caesarean section [16], while in our study this frequency appears to be slightly more than twice as high, in line with the literature [25].

Regardless of the care setting, maternity services and healthcare professionals are responsible for ensuring that all care procedures are evidence-based, safe, and of high quality [26]. In the case of planned out-of-hospital births, ensuring a prompt transfer from home to the hospital represents a good practice when a potential risk is identified. Promoting high quality maternity care involves guaranteeing the transfer from home to hospital, which requires interprofessional collaboration, effective communication, and the implementation of standardised procedures to ensure personalised and safe care for the mother and baby [27]. In our study, the prevalence of transfers in the Lazio Region is 13.6%, in line with the literature [28, 29].

Consistent with previous studies [30-34], giving birth in an out-of-hospital setting is associated with a lower number of medical interventions (e.g., inductions, episiotomies, operative vaginal deliveries with vacuum extraction, and caesarean sections) and a lower rate of maternal complications (less instances of third and fourth-degree lacerations, haemorrhage, fever). In our study there were no cases of induced labour and a low number of medical interventions, while national data on hospital births, show a prevalence of 32.1% for induced labour, 4.24% for operative vaginal deliveries with vacuum extraction, and 31% for caesarean sections [3]. In this comparison, it is essential to emphasize how our sample is highly selected, as it comprises women with physiological pregnancies, a crucial requirement for giving birth in an out-of-hospital setting. Conversely, the hospital serves as the only alternative for women with high-risk conditions, despite the majority of pregnancies being physiological.

Regarding midwifery care, satisfactory results emerged in our study with respect to the utilisation of upright positions during birth, delayed cord clamping, the presence of a support person, immediate skin-to-skin contact to promote breastfeeding and prevent hypothermia, delayed bathing for 24 hours after birth, and continuity of care postpartum, all of which is in line with WHO recommendations on "intrapartum care for a positive childbirth experience" [35, 36]. In particular, as regard breastfeeding and companion of the mother's choice, our study guaranteed this best practice compared to what happened in hospital setting during COVID-19 pandemic [37].

The practice of planned out-of-hospital birth requires unique skills, knowledge and methods related to the birthing process and midwifery. In out-of-hospital settings, birth occurs with respect to physiology, without routine interference, and with careful use of technologies appropriate for such an environment [38]. This aligns perfectly with the preferences and motivations that drive low-risk women to choose this setting [23]. Furthermore, the midwifery model of care leads to greater satisfaction among women [39-41], and its continuity during the postpartum period could bring long-term benefits, including increased breastfeeding [42, 43]. Our study shows that the prevalence of exclusive breastfeeding remains high at one week and one month after birth. In Italy, the rates of breastfeeding initiation and continuation vary by region, depending on education and socio-economic conditions [44]. Moreover, the use of breast milk substitutes is a widespread practice during the hospital stay as well as their prescription at discharge [45]. In the Italian context where breastfeeding prevalence is low, our results must be taken into consideration, as they show how respect for birth physiology and adoption of the midwifery model of care play a pivotal role in strengthening the breastfeeding skills of women and babies [45, 46]. In fact, regardless of the place of birth, competent health personnel able to meet women's needs is a key factor for the satisfaction of the childbirth experience [47].

The strength of the study is the completeness and accuracy of data collection, covering 95% of out-of-hospital births in Lazio Region. Moreover, all groups of midwives involved in out-of-hospital assistance in the Lazio Region participated in this study. Trained midwives collected data using a coded questionnaire, ensuring data quality and completeness.

This descriptive study estimated how many women, having initiated the pathway, decide to forego it, and how many women are transferred due to problems during pregnancy, labor and delivery. These are useful indicators for comparing experiences. All these aspects can be a starting point for establishing an epidemiological surveillance system.

This study also has some limitations. First, the findings are not generalisable at a national level due to the involvement of only one region. Data collection relied on local coordination for completing the records due to the absence of a structured monitoring system. Possible implications for future research would include additional indicators in the medium to long term postpartum period to study the outcomes in terms of public health. Finally, it would be useful to replicate and implement the present investigation in other Italian regions in order to achieve a comprehensive national epidemiological overview.

CONCLUSIONS

This study confirms that a planned out-of-hospital birth is a safe, adequate, appropriate, and effective choice for low-risk pregnant women. However, it is essential to emphasise that the safety, quality, and appropriateness of such births depend on a regulatory system that includes careful planning and appropriate monitoring. Additionally, in view of the possible increase of out-of-hospital births, and in order to maintain the high standards of safety and quality, it would be desirable to implement a national surveillance system for monitoring maternal and neonatal outcomes of out-of-hospital births. A number of countries have adopted specific tools to support the continuous improvement and delivery of quality maternity care, for example the creation and maintenance of datasets such as the MANA Statistic Project (Midwives Alliance North America) in the United States [12].

Authors' contributions

RVC, SC: conceptualization, data curation, formal analysis, investigation, methodology, project administration, supervision, validation, visualization, writing – original draft, writing – review & editing; FZ, MG: data curation, formal analysis, investigation, methodology, project administration, supervision, validation, visualization, writing – original draft, writing – review & editing; FV: data curation, investigation, supervision, validation, visualization, writing – original draft; MS: investigation, methodology, project administration, supervision, validation, visualization, writing – original draft, writing – review & editing.

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Ethic Committee

The design of the study was approved by the Ethics Committee of Unicamillus – Saint Camillus International University of Health and Medical Sciences, Rome, Italy,

Conflict of interest statement

Each Author declares that he or she has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangement, etc.) that might pose a conflict of interest in connection with the submitted article.

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REFERENCES

1. Società Italiana di Neonatologia. Parto in casa: Trend in aumento a causa della pandemia, 2020. Available from: https://blog.sin-neonatologia.it/wp-content/uploads/2020/06/CS-SIN-parto-in-casa-06.06.2020.pdf.
2. Ministero della Salute - Direzione Generale della Digitalizzazione, del Sistema Informativo Sanitario e della Statistica - Ufficio di Statistica. Certificato di assistenza al parto (CeDAP): Analisi dell'evento nascita - Anno 2018. Roma: Ministero della Salute; 2021. Available from: https://www.salute.gov.it/imgs/C_17_pubblicazioni_3034_allegato.pdf.
3. Ministero della Salute - Direzione Generale della Digitalizzazione, del Sistema Informativo Sanitario e della Statistica Ufficio di Statistica. Certificato di assistenza al parto (CeDAP) Analisi dell'evento nascita – Anno 2022. Roma: Ministero della Salute; 2023. Available from: https://www.salute.gov.it/imgs/C_17_pubblicazioni_3346_allegato.pdf.
4. Gregory ECW, Osterman MJK, Valenzuela CP. Changes in home births by race and Hispanic origin and state of residence of mother: United States, 2019-2020 and 2020-2021. Natl Vital Stat Rep. 2022;71(8):1-10. doi: https://dx.doi.org/10.15620/cdc:121553
5. Australian Institute of Health and Welfare. Australia's mothers and babies - 2021. Updated 2023. Available from: https://www.aihw.gov.au/getmedia/bf03fda0-6d37-46f3-8ba6-9c3ebadc26f8/australia-s-mothers-and-babies.pdf?v=20240115130043&inline=true.
6. Cicero RV, Colaceci S, Amata R, Spandonaro F. Cost analysis of planned out-of-hospital births in Italy. Acta Biomed 2022;93(4):e2022227. doi: 10.23750/abm.v93i4.12923
7. National Chilbirth Trust. NCT response: New national statistics on home birth. Bristol, UK: NCT; 2011. Available from: https://www.nct.org.uk/about-us/media/news/nct-response-new-national-statistics-home-birth.
8. World Health Organization. Safe motherhood. Care in normal birth: A practical guide. Report of a technical working group. Geneva: WHO Department of Reproductive Health and Research; 1996.
9. National Institute for Health and Care Excellence. Intrapartum care for healthy women and babies. NICE; 2014. Available from: https://www.nice.org.uk/guidance/cg190/chapter/Recommendations#place-of-birth.
10. Scarf VL, Rossiter C, Vedam S et al. Maternal and perinatal outcomes by planned place of birth among women with low-risk pregnancies in high-income coun-

tries: A systematic review and meta-analysis. Midwifery. 2018;62:240-55. doi: 1016/j.midw.2018.03.024
11. Hutton EK, Reitsma A, Simioni J et al. Perinatal or neonatal mortality among women who intend at the onset of labour to give birth at home compared to women of low obstetrical risk who intend to give birth in hospital: A systematic review and meta-analyses. EClinicalMedicine. 2019;14:59-70. doi: 10.1016/j.eclinm.2019.07.005
12. Colaceci S, Cicero RV, Reali L, Grandolfo M, Arena I, Battaglia S, De Angelis D, Romano C, Mazza P, Monsignore M, Olivieri S, Dellafiore F. Il parto extra-ospedaliero: un'indagine quanti-qualitativa presso una casa maternità di Roma. Quaderni ACP. 2021;28(6):258-62. doi: 1053141/QACP.2021.258-262
13. American College of Nurse-Midwives. Midwifery provision of home birth services: American College of Nurse-Midwives. J Midwifery Womens Health. 2016:61(1):127-33. doi: 10.1111/jmwh.12431
14. Royal College of Obstetricians and Gynaecologists, Royal College of Midwives. Home births. Joint statement n. 2; 2007.Available from: https://birthguidechicago.com/wp-content/uploads/2018/07/home_births_rcog_rcm0607.pdf.
15. Australian College of Midwives. (ACM). Position statement for planned birth at home. 3rd ed. 2019. Available from: https://www.midwives.org.au/common/Uploaded%20files/_ADMIN-ACM/Planned-Birth-at-Home-Position-Statement-2019.pdf.
16. Campiotti M, Campi R, Zanetti M et al. Low-Risk planned out-of-hospital births: Characteristics and perinatal outcomes in different Italian birth settings. Int J Environ Res Public Health. 2020;17:2718. doi: 10.3390/ijerph17082718
17. Associazione Nazionale Culturale Ostetriche Parto a Domicilio e Casa Maternità. Linee guida di assistenza al travaglio e parto fisiologico a domicilio e casa maternità. 1991, 4a rev. 2017. Available from: http://www.nascereacasa.it/wp-content/uploads/2016/08/Linee-Guida-_2017_AssociazioneNascereinCasa.pdf.
18. 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 agosto 2015 e Det. n. G11586 del 28 settembre 2015. Bollettino Ufficiale della Regione Lazio n.104, suppl. n. 1, 29 dicembre 2016.
19. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. Lancet. 2007;370(9596):1453-7. doi: 10.1016/S0140-6736(07)61602-X
20. Grünebaum A, Bornstein E, Katz A, Chervenak FA. Worsening risk profiles of out-of-hospital births during the COVID-19 pandemic. Am J Obstet Gynecol. 2022;226(1):137-8. doi: 10.1016/j.ajog.2021.11.1346
21. Cheng RJ, Fisher AC, Nicholson SC. Interest in home birth during the COVID-19 pandemic: Analysis of Google trends data. J Midwifery Womens Health. 2022;67(4):427-34. doi: 10.1111/jmwh.13341
22. Colaceci S, Anderson G, Ricciuto V, Montinaro D, Alazraki G, Mena-Tudela D. Experiences of birth during COVID-19 pandemic in Italy and Spain: A thematic analysis. Int J Environ Res Public Health. 2022;19(12):7488. doi: 10.3390/ijerph19127488
23. Descieux K, Kavasseri K, Scott K, et al. Why women choose home birth: a narrative review. MAHEC Online J Res. 2017;3(2):1-10. Available from: https://sys.mahec.net/media/onlinejournal/why_women.pdf.
24. Declercq E, MacDorman MF, Menacker F, et al. Characteristics of planned and unplanned home births in 19 states. Obstet Gynecol. 2010;116(1):93-9. doi: 10.1097/AOG.0b013e3181e21f6d
25. Bayrampour H, Lisonkova S, Tamana S, Wines J, Vedam S, Janssen P. Perinatal outcomes of planned home birth after cesarean and planned hospital vaginal birth after cesarean at term gestation in British Columbia, Canada: A retrospective population-based cohort study. Birth. 2021;48(3):301-8. doi: 10.1111/birt.12539
26. Safer Care Victoria. Homebirth: Clinical guidance. Melbourne: Safer Care Victoria; 2021. Available from: https://www.safercare.vic.gov.au/sites/default/files/2021-05/GUIDANCE_Homebirth.pdf.
27. Home Birth Summit, Collaboration Task Force. Best practice guidelines: Transfer from planned home birth to hospital. Available from: https://www.homebirthsummit.org/wp-content/uploads/2014/03/HomeBirthSummit_BestPracticeTransferGuidelines.pdf.
28. 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;95:420-8. doi: 10.1111/aogs.12858
29. Blix E, Kumle M, Kjærgaard H et al. Transfer to hospital in planned home births: a systematic review. BMC Pregnancy Childbirth. 2014;14:179. doi: 10.1186/1471-2393-14-179
30. Olsen O. Meta-analysis of the safety of home birth. Birth. 1997;24(1):4-13;discussion14-6. doi: 10.1111/j.1523-536x.1997.tb00330.x
31. Olsen O, Clausen JA. Planned hospital birth versus planned home birth. Cochrane Database Syst Rev. 2012;9(9):CD000352. doi: 10.1002/14651858.CD000352.pub2
32. 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):377-83. doi: 10.1503/cmaj.081869
33. Bolten N, de 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 Childbirth. 2016;16(1):329. doi:10.1186/s12884-016-1130-6
34. Hutton EK, Cappelletti A, Reitsma AH, et al. Outcomes associated with planned place of birth among women with low-risk pregnancies. CMAJ. 2016;188(5):E80-E90. doi: 10.1503/cmaj.150564
35. World Health Organization. WHO recommendations: intrapartum care for a positive childbirth experience. Geneva: World Health Organization; 2018.
36. Istituto Superiore di Sanità; EpiCentro – L'Epidemiologia per la Sanità Pubblica. Percorso nascita. Documentazione. Nel mondo. Available from: https://www.epicentro.iss.it/percorso-nascita/documentazione-mondo.
37. Zambri F, Nannavecchia AM, Brescianini S, et al. Breastfeeding and presence of the companion of woman's choice during COVID-19 pandemic in Italy: Regional population-based routine data and best practices at birth. Epidemiol Prev. 2023;47(4-5):263-72. English. doi: 10.19191/EP23.4-5.A587.066
38. Stone NI, Thomson G, Tegethoff D. Skills and knowledge of midwives at free-standing birth centres and home birth: A meta-ethnography. Women Birth. 2023;36(5):e481-e94. doi: 10.1016/j.wombi.2023.03.010

39. Sandall J, Soltani H, Gates S, et al. Midwife-led continuity models versus other models of care for childbearing women. Cochrane Database Syst Rev. 2016;4(4):CD004667. doi: 10.1002/14651858.CD004667.pub5
40. Zielinski R, Ackerson K, Kane Low L. Planned home birth: Benefits, risks, and opportunities. Int J Womens Health. 2015;7:361-77. doi: 10.2147/IJWH.S55561
41. 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
42. International Confederation of Midwives. Phylosophy and model of midwifery care. 's-Gravenhage, the Netherlands: ICM; 2024. Available from: https://internationalmidwives.org/resources/philosophy-and-model-of-midwifery-care/.
43. Menichini D, Zambri F, Govoni L, et al. Breastfeeding promotion and support: A quality improvement study. Ann Ist Super Sanità 2021;57(2):161-6. doi: 10.4415/ANN_21_02_08
44. 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
45. 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 Sanità. 2020;56(2):142-9. doi: 10.4415/ANN_20_02_03
46. Istituto Superiore di Sanità. Sorveglianza bambini 0-2 anni. Sintesi dei risultati – Edizione 2022. Available from: https://www.epicentro.iss.it/sorveglianza02anni/pdf/Sintesi_CONVEGNO-O_2__Versione%20STAMPA_23_Marzo_2023.pdf.
47. 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;50(1):6-19. doi: 10.1016/j.jogn.2020.10.005