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ORIGINAL RESEARCH

Women's use of Swedish health care during the postpartum period in relation to maternal country of birth—A population-based study

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Abstract

Introduction: Migrant women are a heterogenous group with both higher and lower risk for pregnancy complications and adverse birth outcomes compared with women in the receiving countries. This study aimed to investigate women's use of Swedish healthcare postpartum, in terms of hospital stay >48 h, readmission to hospital, and specialized out-patient clinic visits, in relation to maternal country of birth.

Material and Methods: A population-based register study including 278 219 primiparous and 367 776 multiparous women in Sweden (2014–2019) using data from Swedish Pregnancy Register, National Patient Register and Statistics Sweden. Multivariable logistic regression analyses were used to estimate associations between maternal country of birth and outcomes, adjusting for year of birth, maternal age, education, pre-gestational hypertension and diabetes, and healthcare region, presented as crude and adjusted odds ratios (aOR) with 95% confidence interval (CI) with Swedish-born women as reference.

Results: Subgroups of migrant women had higher odds of *postpartum hospital stays > 48 h*, particularly women from Eritrea (primiparous aOR 2.80, CI 2.49–3.15; multiparous aOR 2.78, CI 2.59–2.98), Somalia (primiparous aOR 2.61, CI 2.34–2.92; multiparous aOR 1.87, CI 1.79–1.97), and India (primiparous aOR 2.52, CI 2.14–2.97; multiparous aOR 2.61, CI 2.33–2.93), compared to Swedish-born women. Primiparous women from Afghanistan (aOR 1.32, CI 1.08–1.6), Iraq (aOR 1.30, CI 1.16–1.46), and Iran (aOR 1.23, CI 1.04–1.45) had slightly higher odds of *hospital readmission*, along with multiparous women from India (aOR 1.34, CI 1.02–1.76) and Somalia (aOR 1.24, CI 1.11–1.38). *Specialized out-patient clinic visits* were most common in primiparous women from Somalia (aOR 1.47, CI 1.35–1.59), Iran (aOR 1.31, CI 1.22–1.42) and Afghanistan (aOR 1.31, CI 1.18–1.46), and in multiparous women from Iran (aOR 1.30, CI 1.20–1.41) and Iraq (aOR 1.15, CI 1.11–1.20), however less common in women from some other countries.

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval; GBD, Global Burden of Disease; NPR, National Patient Register; OR, odds ratio; SCB, Statistics Sweden; SPR, Swedish Pregnancy Register.

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Conclusions: The use of Swedish health care during the postpartum period varied among women, depending on their country of birth. Women from certain countries had particularly high odds of postpartum hospital stays exceeding 48 h, compared to Swedish-born women, regardless of parity and pre-gestational medical disorders. Further studies are needed to determine whether the individual needs of migrant women are being met during the postpartum period or not.

KEYWORDS
length of hospital stay, migrant women, out-patient care, postpartum care, postpartum health, readmission, register study

1 | INTRODUCTION

In Sweden, as in other high-income countries, postpartum care is the part of maternity care women are least happy with.[1] The short hospital stays, with restricted time for support in managing physical and emotional changes, may be one possible explanation.[2,3] Additionally, women may feel neglected after discharge, when the focus shifts from the pregnant woman to her newborn baby.[1,2] Postpartum health problems are common,[4] and many women seek emergency medical care for bleeding, infections, and pain during the first month after birth.[5] If left untreated, health problems, such as complications after perineal injuries,[6] and depressive symptoms,[7] may be long-lasting. Additionally, the population giving birth in high-income countries is in continuous change, and risk factors for adverse pregnancy outcomes are increasing, such as advanced maternal age, obesity and preexisting medical conditions.[8–10] A growing body of literature shows that migrant women, who are a heterogeneous group with different backgrounds, have both higher and lower prevalence of pregnancy complications, interventions during labor and birth, and health problems, compared with women in the receiving country.[11] Migrant women from Sub-Saharan Africa and Asia are at a particularly high risk of perinatal morbidity and mortality.[12]

Barriers to equitable and high-quality care for migrant women have been reported worldwide, also in Sweden,[13] such as communication difficulties, lack of familiarity with how care is provided and discrimination,[14,15] and healthcare staff's attitudes.[16] A systematic review[14] of migrant women's experiences of maternity care in a number of countries (including Sweden) has shown that migrant women consistently rate their care more negatively than non-migrant women. Little is known about their postpartum health, how healthcare is provided to them and their care needs.[15] To develop postpartum care that responds also to migrant women's different needs, more knowledge about to what extent they use postpartum healthcare services is needed.

This study aimed to investigate women's use of Swedish health care during the postpartum period, in terms of hospital stays >48 h, readmission to hospital, and visits to specialized out-patient clinic, in relation to maternal country of birth.

Key message

Women from a majority of countries had higher odds of hospital stays exceeding 48 h after the birth compared with Swedish-born women. Hospital readmission and visits to specialized out-patient clinic were also more common in women from certain countries.

2 | MATERIAL AND METHODS

This national population-based register study used data from the vast majority of births in Sweden between January 2014 and December 2019. Data from three national registers were merged; the Swedish Pregnancy Register (SPR), the National Patient Register (NPR), and Statistics Sweden (SCB). This was made possible through the national identity number assigned to all Swedish residents.

In Sweden, all maternity care is publicly funded and primarily provided by midwives unless medical complications arise. This care includes pregnancy, labor, birth, the first postpartum week, and a routine check-up, usually within 6–16 weeks after birth.[1] The recommended length of hospital stay after an uncomplicated vaginal birth varies between 6 and 48 h, with an average of 38 h,[17] and after a cesarean, approximately 3 days.[1] In cases of pregnancy complications, women are usually referred to an obstetrician or general physician for a follow-up visit 6–12 weeks postpartum at a specialized out-patient clinic. After discharge, women are required to seek emergency care or contact a health center for any new health issues. If necessary, they can be referred to a specialized out-patient clinic.

The SPR is based on merged data from the Swedish Maternal Health Care Register,[18] the Swedish National Quality Register for Prenatal Diagnosis,[19] and the Swedish Medical Birth Register.[20] The SPR includes prospectively collected information on socioeconomic background, pre-pregnancy health and diseases, present pregnancy, labor and birth, and the postpartum check-up.[21] The high coverage

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rate of >90% of all births is possible because most data is retrieved from electronic medical records. However, all healthcare regions were not connected to this system at the time of data retrieval.[21] The agreement of this data with medical records is good (70%–94%), or very good (≥95%).[18]

The NPR includes information on inpatient care and specialized out-patient visits to medical doctors in private and public care in all Swedish county councils. Primary care or visits to midwifes/nurses are not covered by the NPR. The coverage of the register is considered to be high.[22]

Finally, the SCB collects, processes, and distributes official statistics in Sweden, and the register data comprise sociodemographic and migration-related information about all individuals resident in Sweden since 1997.[23]

The study sample comprised women who gave birth in Sweden between 2014 and 2019. Women who had migrated from Sweden within 16 weeks after birth ($n=283$), were adopted ($n=1638$), had missing information about country of birth ($n=9617$) or parity ($n=5958$), and women without a national identity number ($n=7859$) were excluded. For multifetal gestations, only information related to the first birth was used.

Information on maternal country of birth, that is, the exposure, was obtained from the SCB and supplemented by the SPR in cases of missing information. Results are reported for births to women from 16 different countries/country groups that contributed the most births (>2900) during the study period. Notably, certain countries were combined for analysis; Croatia, Slovenia, Bosnia and Herzegovina, Yugoslavia, Macedonia, Serbia, and Montenegro were categorized into *Former Yugoslavia*; Estonia, Latvia, and Lithuania were categorized into *Baltic countries*; and *Russia* included women from Russia and the former Soviet Union. Furthermore, citizens from Denmark, Greenland, Finland, Iceland, Norway, Svalbard and Jan Mayen, and the Aaland and Faroe Islands were combined into *Nordic countries*. This decision was based on their freedom to move to Sweden without specifying their reason for immigration, and similarities in healthcare systems and languages. The remaining countries were merged into *other countries* (38.3% of migrants).

Hospital stay > 48 h postpartum was calculated in full hours, from the time of birth to the time of the mother's discharge from the postpartum ward, as recorded in the SPR. The NPR provided information on *hospital readmission* and/or *specialized out-patient clinic visits* within 16 weeks postpartum. Indications were based on inpatient and out-patient diagnosis from the first recorded visit or readmission according to the Swedish version of International Statistical Classification of Diseases 10 codes (ICD-10-SE) on an aggregated level (chapter A-N,R,S,Z) and the blocks and detailed level of O80-O99. The chapters were divided into: *certain infectious and parasitic diseases* (A00-B99), *neoplasms* (C00-D48), *internal medical disorders* (D50-D89, E00-E90, G00-G99, I00-I99, J00-J99, K00-K93, M00-M99), *mental and behavioral disorders* (F00-F99), *eye/ear/skin problems* (H00-H95, L00-L99), *gynecological or childbirth-related* (N00-N99, O00-O99), as well as *unspecified symptoms, signs, injuries and contacts* (R00-R99, S00-T98, Z00-Z13).

From the SCB, additional information (for the year of the birth) was as follows: education (not fulfilled elementary school (<9 years), elementary school (9 years), secondary school (10–12 years), university/college), and marital status (married or cohabiting, single, or other family situation); the mother's disposable income categorized into quartiles percentiles (<25, 25–50, 50–75, >75) based on the household income per unit of consumption for all women giving birth in Sweden that year; reason for migration (Nordic migrants, work/education, family reunion or establishment, refugee, other, missing) and length of residence in Sweden (<2 years, 2–5 years, 6–9 years, ≥10 years). From the SPR, data on maternal age (<25, 25–34, ≥35 years), pre-gestational medical disorder (chronic hypertension, pre-pregnancy diabetes, venous thrombosis, cardiovascular diseases, psychiatric care) based on check-box (yes/no), parity (0, 1, 2–4, ≥5), BMI (kg/m^2), tobacco use (yes/no regardless of quantity), pregnancy complications (hypertension (yes/no), pre-eclampsia/eclampsia (yes/no), and gestational diabetes (yes/no)) based on ICD-10 diagnosis in medical records at discharge, labor and birth (onset of labor, mode of birth, blood loss >1000 mL (scale), episiotomy (yes/no), perineal injury degree 3–4 (yes/no)), neonatal outcomes (gestational age (weeks) at birth, Apgar score <7 at 5 min, stillbirth (yes/no)).

2.1 | Statistical analyses

Descriptive analyses were reported as numbers and percentages. Univariable and multivariable regression analyses were used to investigate the association between the mother's country of birth and outcomes (hospital stay >48 h postpartum, hospital readmission, and specialized out-patient clinic visits). Adjustments were made for; year of birth, age, educational level, pre-gestational medical disorders (chronic hypertension, diabetes, cardiovascular diseases, thrombosis, and psychiatric care), and healthcare region. Analyses were performed separately for primiparous and multiparous women. To account for dependency between births to the same mother, we used robust standard errors that allowed for within-mother clustering.[24] Sensitivity analyses were performed in a sub-sample of women with a spontaneous onset of labor, a non-instrumental vaginal birth at term, absence of perineal injury degree III and IV, and total blood loss ≤1000 mL, to explore the impact of complicated labor and birth. Results are reported as crude and adjusted odds ratios (aORs) with 95% confidence intervals (CIs). Obvious errors in the variables *parity* and *maternal age* (i.e., women could occur as primiparous more than once or being younger at a later birth) ($n=1232$), were not corrected. Such a correction would include a larger proportion of de facto multiparous births than the corresponding group of Swedish-born women, leading to a bias in the association between country of birth and care consumption. To avoid list-wise deletion and potential bias due to missing data, we used a multiple imputation technique to replace missing values in adjustment variables using the remaining variables (exposure, outcomes, and stratification variables) as predictors. Five imputed datasets were generated

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using the method of chained equations[25] as implemented in the R package mice. Missing outcome data existed only for *hospital stay > 48 h postpartum* (primiparous; 8.8%, multiparous; 8.4%), and were not imputed. The missing data occurs due to missing values in the dataset, such as the discharge date, or discharge time (one or more of them). SPSS version 28.0.1.0 (142) and R version 4.2.1 were used for analyses.

3 | RESULTS

The final sample included 183 772 births to migrant women and 454 364 to Swedish women, in total 638 136 births. Characteristics of the study sample are shown in Table 1. Migrant primiparous women were more likely to be either young (<25 years) or of advanced maternal age (>35 years), to be single or in another family situation, and have low levels of education and income. Furthermore, they were less likely to have a history of psychiatric care, to be pre-obese or obese, use tobacco, or diagnosed with hypertension and pre-eclampsia/eclampsia than the Swedish-born women. In addition, migrant primiparous women had higher rates of gestational diabetes, underwent more emergency cesarean sections, and experienced more perineal injuries of degree III and IV. Migrant multiparous women differed from the Swedish-born in the same factors. However, a higher proportion of migrant women had pre-obesity or obesity compared to Swedish-born women. Additionally, both planned and emergency cesarean sections were more frequent among multiparous migrant women. Rates of perineal injury degree III and IV were comparable to Swedish multiparous women. Finally, most migrant women had immigrated for family reunions/establishment or refuge, and a majority of primiparous women had <6 years length of residence.

A majority of primiparous women (73.9%) and more than a third of multiparous ones (38.5%) had a *hospital stay > 48 h* postpartum. Regardless of parity, the probability of a *hospital stay > 48 h* postpartum (Figure 1A,B) was higher in women from eight out of the 16 countries and was two-fold or more in women from Eritrea (primiparous aOR 2.80, CI 2.49–3.15; multiparous aOR 2.78, CI 2.59–2.98), Somalia (primiparous aOR 2.61, CI 2.34–2.92; multiparous aOR 1.87, CI 1.79–1.97), India (primiparous aOR 2.52, CI 2.14–2.97; multiparous aOR 2.61, CI 2.33–2.93), and China (primiparous aOR 1.93, CI 1.66–2.24; multiparous aOR 1.69; CI 1.52–1.88). However, primiparous women (Figure 1A) from Poland (aOR 0.83; CI 0.76–0.90) and Iraq (aOR 0.92; CI 0.87–0.98), and multiparous women (Figure 1B) from the Nordic countries (aOR 0.87; CI 0.80–0.95) had a lower risk of a *hospital stay > 48 h* postpartum compared to Swedish-born women.

A low proportion of primiparous (4.6%) and multiparous (3.3%) women were *readmitted to a hospital* within 16 weeks postpartum. For primiparous women, the probability of being readmitted (Figure 2A) was slightly higher for those from Afghanistan (aOR 1.32; CI 1.08–1.62), Iraq (aOR 1.30; CI 1.16–1.46), and Iran (aOR 1.23; CI 1.04–1.45) compared with Swedish-born primiparous women. However, primiparous women from the Baltic countries (aOR 0.58; CI 0.40–0.84) and Poland (aOR 0.77; CI 0.63–0.94) had a lower risk of readmission compared to Swedish-born primiparous women. In multiparous women (Figure 2B), those from India (aOR 1.34, CI 1.02–1.76), Somalia (aOR 1.24; CI 1.11–1.38), other countries (aOR 1.23; CI 1.16–1.30), Iraq (aOR 1.20; CI 1.08–1.32), Syria (aOR 1.17, CI 1.05–1.29), and Former Yugoslavia (aOR 1.16; CI 1.04–1.30) had a slightly higher probability of being readmitted compared to Swedish-born women.

Around one-third of primiparous (31.7%) and multiparous (29.0%) women visited a *specialized out-patient clinic* at least once within 16 weeks postpartum. For primiparous women (Figure 3A), a slightly higher probability of a visit was seen in those from Somalia (aOR 1.47; CI 1.35–1.59), Iran (aOR 1.31; CI 1.22–1.42), Afghanistan (aOR 1.31; CI 1.18–1.46), Iraq (aOR 1.24; CI 1.17–1.31), and India (aOR 1.19; CI 1.07–1.33) compared with Swedish-born women. On the contrary, primiparous women from six of the 16 countries were less likely to visit a specialized out-patient clinic, including those from Thailand (aOR 0.79; CI 0.70–0.88), the Baltic countries (aOR 0.80; CI 0.70–0.91), Poland (aOR 0.83; CI 0.76–0.89), and Turkey (aOR 0.87; CI 0.78–0.97). For multiparous women (Figure 3B), a slightly higher probability of visiting a specialized out-patient clinic was seen for those from Iran (aOR 1.30; CI 1.20–1.41), Iraq (aOR 1.15; CI 1.11–1.20), Former Yugoslavia (aOR 1.08, CI 1.03–1.13), and Somalia (aOR 1.07; CI 1.02–1.12) compared with Swedish-born multiparous women. However, multiparous women from seven countries were less likely to visit a specialized out-patient clinic compared with the Swedish-born, including women from Thailand (aOR 0.76; CI 0.69–0.84), Eritrea (aOR 0.80; CI 0.74–0.87), the Baltic countries (aOR 0.83; CI 0.73–0.93), China (aOR 0.85; CI 0.75–0.95), and Syria (aOR 0.90; CI 0.86–0.94).

A sensitivity analysis of a sub-sample of women with uncomplicated births, characterized by spontaneous onset of labor, non-instrumental vaginal birth at term, no perineal injury degree III/IV, and total blood loss ≤1000 mL, showed similar associations between maternal country of birth and outcomes, however with some exceptions (Tables S1 and S2). The probability for a *hospital stay > 48 h* postpartum remained highest for women from Eritrea, India, Somalia, China, and Afghanistan, irrespective of parity. However, lower probabilities were observed for women from Poland and Iraq (primiparous) and Nordic countries (multiparous). The rate of hospital readmission remained higher for women from China, Afghanistan (primiparous), Iraq, and Other countries (primi- and multiparous), but was lower for those from Baltic countries and Poland (primiparous). Finally, compared to Swedish-born women, primiparous women from Iran, China, and Iraq had higher probabilities of *visiting specialized out-patient clinics*, while lower probabilities were seen for those from Turkey and Thailand. Among multiparous women, higher probabilities for a visit were found for those from Iran, Turkey, Iraq, and Former Yugoslavia, with lower probabilities for women from Eritrea, Thailand, Baltic countries, and Syria.

Regardless of country of birth, approximately 5% of women experienced a *gynecological or childbirth-related* complication, which led

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TABLE 1 Characteristics of sample.

	Primiparous women ($n = 274\,692$)		Multiparous women ($n = 363\,444$)	
	Migrant ($n = 66\,959$)	Swedish-born ($n = 207\,733$)	Migrant ($n = 116\,813$)	Swedish-born ($n = 246\,631$)
	n (%)	*n* (%)	*n* (%)	*n* (%)
Socio-economics				
Age (years)				
<25	13 563 (20.3)	30 385 (14.6)	8211 (7.0)	10 020 (4.1)
25-34	41 642 (62.2)	148 133 (71.3)	69 064 (59.1)	156 426 (63.4)
≥35	11 751 (17.6)	29 214 (14.1)	39 535 (33.8)	80 183 (32.5)
Missing	3	1	3	2
Marital status				
Married or cohabiting	59 325 (92.0)	177 846 (94.0)	106 904 (93.8)	224 537 (97.3)
Single	1642 (2.5)	3744 (2.0)	2762 (2.4)	2052 (0.9)
Other family situation	3544 (5.5)	7583 (4.0)	4361 (3.8)	4280 (1.9)
Missing	2448	18560	2786	15762
Education				
Not fulfilled elementary school (<9 years)	3684 (5.8)	406 (0.2)	18 276 (16.6)	633 (0.3)
Elementary school (9 years)	4072 (6.4)	5607 (2.8)	9429 (8.6)	7057 (2.9)
Secondary school (10-12 years)	23 986 (38.0)	89 929 (44.1)	43 896 (39.9)	109 109 (45.0)
University/college	31 449 (49.8)	107 834 (52.9)	38 370 (34.9)	125 419 (51.8)
Missing	3768	3957	6842	4413
Mother's income				
<25 percentile	34 437 (51.6)	40 762 (19.6)	48 124 (41.3)	36 228 (14.7)
25-50 percentile	11 876 (17.8)	54 824 (26.4)	27 697 (23.8)	64 717 (26.3)
50-75 percentile	9695 (14.5)	57 185 (27.5)	20 821 (17.9)	71 320 (28.9)
>75 percentile	10 694 (16.0)	54 845 (26.4)	19 863 (17.0)	74 248 (30.1)
Missing	257	117	308	118
Migration				
Reason for immigration				
Nordic citizen	2270 (3.9)	NA	2863 (2.7)	NA
Work/education	4525 (7.8)		4333 (4.1)	
Family reunion/establishment	30 300 (52.4)		50 105 (47.2)	
Refugee	19 803 (34.3)		47 197 (44.5)	
Other	879 (1.5)		1660 (1.6)	
Missing	9182		10655	
Length of residence				
<2 years	15 727 (23.7)	NA	13 875 (12.0)	NA
2-5 years	22 211 (33.5)		37 331 (32.3)	
6-9 years	10 089 (15.2)		26 011 (22.5)	
>10 years	18 284 (27.6)		38 397 (33.2)	
Missing	648		1199	
Pre-gestational medical disorders				
Hypertension	197 (0.3)	783 (0.4)	528 (0.5)	1375 (0.6)
Missing	4220	14 988	5366	15 035
Diabetes	319 (0.5)	1658 (0.9)	1083 (1.0)	2043 (0.9)
Missing	4099	14 698	5175	14 700

(Continues)

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TABLE 1 (Continued)

	Primiparous women (*n* = 274 692)		Multiparous women (*n*=363 444)	
	Migrant (*n* = 66 959)	Swedish-born (*n* = 207 733)	Migrant (*n* = 116 813)	Swedish-born (*n* = 246 631)
	n (%)	*n* (%)	*n* (%)	*n* (%)
Thrombosis	226 (0.4)	1396 (0.7)	622 (0.6)	2479 (1.1)
Missing	4127	14808	5199	14805
Cardiovascular diseases	760 (1.2)	2951 (1.5)	1273 (1.1)	3518 (1.5)
Missing	4128	14762	5191	14756
Psychiatric care	3695 (5.9)	33 251 (17.3)	5965 (5.4)	35 109 (15.2)
Missing	4359	15547	5683	15756
Pregnancy				
Parity				
0	66 959 (100.0)	207 733 (100.0)	NA	NA
1			62 246 (53.3)	172 882 (70.1)
2-4	NA	NA	49 352 (42.2)	71 719 (29.1)
>5			5215 (4.5)	2030 (0.8)
BMI (kg/m^2) in early pregnancy				
Underweight (<18.5)	3118 (5.0)	4582 (2.4)	2820 (2.5)	4887 (2.1)
Normal weight (18.5–24.99)	39 073 (62.1)	118 365 (61.0)	51 682 (46.6)	133 522 (57.4)
Pre-obesity (25.0–29.99)	14 629 (23.3)	46 768 (24.1)	35 285 (31.8)	59 731 (25.7)
Obesity class I (30.0–34.99)	4666 (7.4)	16 788 (8.6)	15 174 (13.7)	23 259 (10.0)
Obesity class II (35.0–39.99)	1081 (1.7)	5600 (2.9)	4570 (4.1)	8159 (3.5)
Obesity class III (>40.00)	321 (0.5)	2031 (1.0)	1441 (1.3)	3084 (1.3)
Missing	4071	13 599	5841	13 989
Tobacco use	7907 (11.8)	32 747 (15.8)	10 893 (9.3)	28 971 (11.8)
Missing	36	107	52	113
Hypertension	1385 (2.1)	7972 (3.8)	1417 (1.2)	5402 (2.2)
Pre-eclampsia/eclampsia	2234 (3.3)	9923 (4.8)	1720 (1.5)	4276 (1.7)
Gestational diabetes	1892 (2.8)	2528 (1.2)	4681 (4.0)	3511 (1.4)
Labor and birth				
Onset of labor				
Spontaneous	46 017 (72.7)	142 011 (73.6)	82 247 (74.2)	167 761 (73.6)
Missing	3693	14782	5983	18554
Induction	13 981 (22.1)	40 669 (21.1)	17 610 (15.9)	39 182 (17.2)
Missing	3693	14784	5985	18 555
Mode of birth				
Non-instrumental vaginal	45 964 (68.7)	149 005 (71.8)	93 781 (80.4)	204 303 (83.0)
Instrumental vaginal	7070 (10.6)	20 079 (9.7)	2375 (2.0)	4539 (1.8)
Planned cesarean	3279 (4.9)	10 435 (5.0)	11 135 (9.5)	21 943 (8.9)
Emergency cesarean	10 559 (15.8)	27 897 (13.4)	9381 (8.0)	15 480 (6.3)
Missing	87	317	141	366
Blood loss >1000 mL	5473 (8.7)	17 151 (8.9)	6930 (6.3)	14 585 (6.4)
Missing	3808	15 150	6147	18 940
Episiotomy	4360 (6.5)	11 857 (5.7)	1927 (1.6)	3140 (1.3)
Perineal injury, degree III and IV	3377 (5.0)	7353 (3.5)	1352 (1.2)	2440 (1.0)

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TABLE 1 (Continued)

	Primiparous women ($n=274\,692$)		Multiparous women ($n=363\,444$)	
	Migrant ($n=66\,959$)	Swedish-born ($n=207\,733$)	Migrant ($n=116\,813$)	Swedish-born ($n=246\,631$)
	n (%)	*n* (%)	*n* (%)	*n* (%)
Neonatal outcomes				
Gestational age (weeks)				
Very preterm (22–31 weeks)	806 (1.3)	2193 (1.1)	909 (0.8)	1427 (0.6)
Moderately preterm (32–36 weeks)	3181 (5.0)	11 002 (5.7)	4554 (4.1)	8994 (3.9)
Term (37–41 weeks)	54 792 (86.4)	166 306 (85.9)	100 506 (90.5)	209 415 (91.5)
Postterm (≥42 weeks)	4616 (7.3)	14 092 (7.3)	5078 (4.6)	8983 (3.9)
Missing	3564	14140	5766	17812
Apgar score <7 at 5 min	2468 (3.9)	7207 (3.7)	2709 (2.5)	4627 (2.0)
Missing	3992	15467	6867	20016
Stillbirth	300 (0.5)	648 (0.3)	506 (0.5)	655 (0.3)
Missing	3676	14 780	5951	18 530

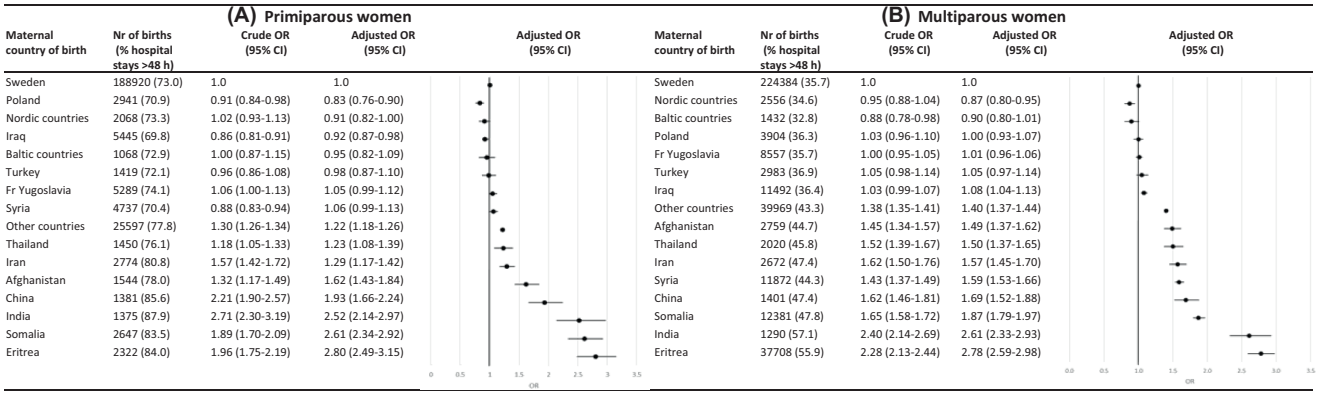

FIGURE 1 Forest plots with analysis and odds ratios for hospital stay >48 h postpartum in relation to maternal country of birth in primiparous (A) and multiparous (B).

to their readmission to the hospital or a visit to the specialized out-patient clinic during the first 16 weeks postpartum (Figure 4). The most common ICD-10 O-diagnoses were mastitis (2.1%), postpartum infection (1.6%) and fever (1.6%) (data not shown). Furthermore, fewer than 5% of women sought specialized health care for issues related to internal medicine, mental and behavioral disorders, eye/ear/skin problems, neoplasms, infections, and parasitic diseases. Most common reasons for readmission and/or an out-patient visit at specialized care were unspecified symptoms, signs, injuries, and other contacts (19.7% migrant women; 18.2% Swedish-born women), such as postpartum follow-ups to an obstetrician.

4 | DISCUSSION

The use of postpartum care varied by maternal country of birth, with both higher and lower usage among migrant women compared with those born in Sweden. Women from a majority of countries had higher odds of hospital stays exceeding 48 h after birth compared to Swedish-born women, particularly women from Eritrea, Somalia, India, and China who had two-fold odds or more. The readmission rate was low (less than 5%), however, higher odds were observed for women from Afghanistan and Iraq (primiparous), as well as from India, Somalia, and other countries (multiparous). Around 30% of women visited a specialized out-patient clinic within 16 weeks, with the highest odds among women from Somalia, Afghanistan (primiparous), Iran, and Iraq (all women).

A majority of both migrant women (primiparous 77.0%; multiparous 43%) and Swedish-born women (primiparous 73.0%; multiparous 35.7%) remained in the hospital for more than 48 h, even after an uncomplicated labor and birth. Nevertheless, migrant women from a majority of countries studied had increased odds of >48-h stays, also after the adjustment for a range of risk factors, and within a sub-group of women with uncomplicated births. This suggests that other explanations than just the higher rates of known pregnancy risk factors are needed, such as diverse backgrounds, migration

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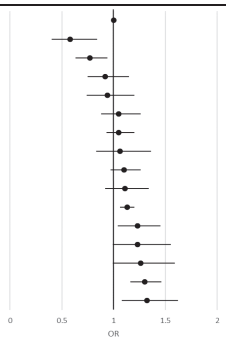
(A) Primiparous women

Maternal country of birth	Nr of births (% readmitted to hospital)	Crude OR (95% CI)	Adjusted OR (95% CI)
Sweden	207733 (4.5)	1.0	1.0
Baltic countries	1159 (2.4)	0.52 (0.36-0.76)	0.58 (0.40-0.84)
Poland	3114 (3.2)	0.70 (0.57-0.86)	0.77 (0.63-0.94)
Nordic countries	2270 (3.9)	0.86 (0.70-1.07)	0.92 (0.75-1.15)
Thailand	1596 (4.3)	0.96 (0.75-1.22)	0.94 (0.74-1.20)
Somalia	2874 (5.1)	1.14 (0.96-1.35)	1.05 (0.88-1.26)
Former Yugoslavia	5703 (4.5)	1.00 (0.88-1.14)	1.05 (0.93-1.20)
India	1491 (4.4)	0.96 (0.75-1.24)	1.06 (0.83-1.36)
Syria	5073 (4.9)	1.08 (0.95-1.23)	1.10 (0.97-1.26)
Eritrea	2496 (5.4)	1.20 (1.00-1.43)	1.11 (0.92-1.34)
Other countries	27624 (4.8)	1.06 (1.00-1.12)	1.13 (1.06-1.20)
Iran	2977 (5.3)	1.18 (1.00-1.39)	1.23 (1.04-1.45)
Turkey	1529 (5.4)	1.20 (0.96-1.50)	1.23 (0.99-1.55)
China	1496 (4.9)	1.10 (0.87-1.39)	1.26 (0.99-1.59)
Iraq	5863 (5.5)	1.24 (1.10-1.39)	1.30 (1.16-1.46)
Afghanistan	1694 (6.0)	1.34 (1.10-1.64)	1.32 (1.08-1.62)

Adjusted OR (95% CI)



(B) Multiparous women

Maternal country of birth	Nr of births (% readmitted to hospital)	Crude OR (95% CI)	Adjusted OR (95% CI)
Sweden	246631 (3.2)	1.0	1.0
Baltic countries	1524 (2.2)	0.69 (0.49-0.97)	0.74 (0.53-1.04)
China	1489 (2.4)	0.73 (0.52-1.02)	0.81 (0.58-1.13)
Thailand	2240 (3.0)	0.93 (0.73-1.19)	0.92 (0.72-1.18)
Poland	4144 (2.8)	0.88 (0.73-1.05)	0.92 (0.77-1.11)
Afghanistan	2956 (3.0)	0.93 (0.74-1.15)	0.93 (0.74-1.16)
Nordic countries	2863 (3.0)	0.92 (0.74-1.15)	0.97 (0.78-1.21)
Eritrea	3989 (3.4)	1.05 (0.88-1.25)	1.05 (0.87-1.26)
Iran	2837 (3.6)	1.12 (0.92-1.37)	1.16 (0.95-1.41)
Turkey	3174 (3.7)	1.14 (0.95-1.38)	1.16 (0.97-1.41)
Fr Yugoslavia	9163 (3.5)	1.11 (0.99-1.24)	1.16 (1.04-1.30)
Syria	12749 (3.5)	1.10 (1.00-1.22)	1.17 (1.05-1.29)
Iraq	12303 (3.7)	1.14 (1.04-1.26)	1.20 (1.08-1.32)
Other countries	42773 (3.7)	1.17 (1.11-1.24)	1.23 (1.16-1.30)
Somalia	13221 (4.0)	1.24 (1.14-1.36)	1.24 (1.11-1.38)
India	1388 (3.9)	1.22 (0.93-1.60)	1.34 (1.02-1.76)

Adjusted OR (95% CI)

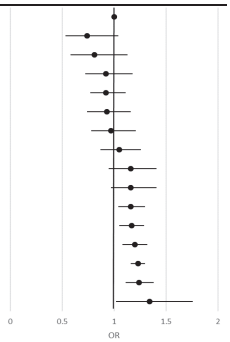


FIGURE 2 Forest plots with analysis and odds ratios for readmissions to hospital within 16 weeks postpartum in primiparous (A) and multiparous (B).

reasons, and lengths of residence among migrant women,[26] which all influence perinatal health.[12] Women from Somalia and Eritrea, who have the highest rates of hospital stays exceeding 48 h, have frequently been reported to utilize perinatal health care more[27] indicating that they require more time for recovery, information, and support, particularly as many have limited knowledge about childbirth processes.[28] Australian studies indicate that humanitarian migrants from South Asia have shorter postpartum stays compared with non-refugee Asian migrants.[29] Additionally, Indian migrant women in Australia have expressed a lack of support in postpartum care, how they struggled to balance traditional and modern postpartum care expectations and faced challenges in managing mental health concerns.[29] Whether the longer stays are about needing more time for recovery, the physical and emotional processes and feeling empowered to care for the baby *or* about the content and quality of care remains unknown. These findings underscore the diverse postpartum needs among migrant women, emphasizing the crucial need for directed interventions and support services to address individual healthcare needs and challenges also *within* different migrant sub-groups.

In times of serious shortage of midwives, access to care facilities could unevenly affect the potential for women to have an adequate length of stay in the hospital. However, our findings do not indicate any inequity in this regard, contrary to a previous Swedish study that showed a larger proportion of migrant women had shorter stays.[30] Rather, women from only three countries (or countries merged) had lower odds for stays >48 h than the Swedish-born ones, that is, the nearby Nordic countries, Poland, and the Baltic countries. These women may have been supported by available family and friends who helped them to manage the new situation with the baby[31] and to cope with common physical symptoms. An alternative interpretation is that the better pregnancy outcomes in women from Eastern Europe, which has been shown previously,[32] may be attributed to the healthy migrant effect, that is, the healthier people, who have been able to migrate, generally have better birth outcomes than women in the receiving country.[33]

The relatively low rate of postpartum hospital readmissions within 16 weeks among both migrant and Swedish-born women suggests that these women received satisfactory care during their hospital stays. The odds of readmission were highest among primiparous women from Afghanistan and Iraq, as well as multiparous women from India, Somalia, and other countries, that is, to some degree similar to those who stayed >48 h in hospital. While some variation can be explained by higher complication rates during labor and birth, this was true only for multiparous women in our study. Studies from the United States (US) have linked postpartum readmissions to complications such as pre-eclampsia before admission, sepsis, and severe maternal morbidity during labor and birth.[34] Another US study found genitourinary or wound infections associated with early postpartum hospital readmissions, regardless of mode of birth.[35] This aligns with our findings that the most common reasons for readmissions were fever, complications after perineal injuries, wound complications after cesarean births and breast problems. Despite the overall low readmission rate, the substantial number of cases during the study period ($n = 24\,662$) implies inconvenience for women, babies and families, along with considerable societal costs.

Around one-third of women in our study visited a specialized out-patient clinic within 16 weeks postpartum, with most seeking help for the same pregnancy-related issues that led to readmissions, such as mastitis and infections. The lower frequency of out-patient visits among certain subgroups of women suggests potential underutilization of health care. For instance, women from Eritrea, China, Turkey, and Thailand, who had higher odds for >48 h hospital stays, would be more likely to have medical reasons for follow-ups. It has been reported that women in Sweden, regardless of country of birth, do not know where to turn if they experience postpartum complications after discharge, which can result in either not seeking care at all or instead seeking specialized care in hospitals.[5] For instance, Thai women in Sweden are often in relationships with Swedish-born men.[36] Even so, they lack knowledge about the Swedish healthcare system and find it challenging to seek care for reproductive health problems relying on

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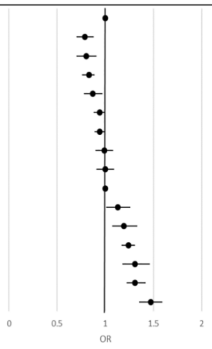
(A) Primiparous women

Maternal country of birth	Nr of births (% spec outpatient care within 16 weeks)	Crude OR (95% CI)	Adjusted OR (95% CI)
Sweden	207733 (31.6)	1.0	1.0
Thailand	1596 (26.1)	0.76 (0.68-0.85)	0.79 (0.70-0.88)
Baltic countries	1159 (28.1)	0.85 (0.74-0.96)	0.80 (0.70-0.91)
Poland	3114 (29.0)	0.88 (0.82-0.96)	0.83 (0.76-0.89)
Turkey	1529 (29.3)	0.90 (0.80-1.00)	0.87 (0.78-0.97)
Former Yugoslavia	5703 (27.5)	0.82 (0.77-0.87)	0.94 (0.89-1.00)
Syria	5073 (26.8)	0.79 (0.74-0.84)	0.94 (0.88-1.00)
Eritrea	2496 (29.8)	0.92 (0.84-1.00)	0.99 (0.90-1.08)
Nordic countries	2270 (32.7)	1.05 (0.96-1.15)	1.00 (0.91-1.09)
Other Countries	27624 (32.7)	1.05 (1.02-1.08)	1.00 (0.97-1.03)
China	1496 (36.0)	1.22 (1.09-1.35)	1.13 (1.01-1.26)
India	1491 (37.0)	1.27 (1.14-1.41)	1.19 (1.07-1.33)
Iraq	5863 (34.7)	1.15 (1.09-1.22)	1.24 (1.17-1.31)
Afghanistan	1694 (34.4)	1.14 (1.03-1.26)	1.31 (1.18-1.46)
Iran	2977 (41.6)	1.54 (1.43-1.66)	1.31 (1.22-1.42)
Somalia	2874 (36.5)	1.24 (1.15-1.34)	1.47 (1.35-1.59)

Adjusted OR (95% CI)



(B) Multiparous women

Maternal country of birth	Nr of births (% spec outpatient care within 16 weeks)	Crude OR (95% CI)	Adjusted OR (95% CI)
Sweden	246631 (28.8)	1.0	1.0
Thailand	2240 (23.7)	0.77 (0.70-0.85)	0.76 (0.69-0.84)
Eritrea	3989 (23.7)	0.77 (0.71-0.83)	0.80 (0.74-0.87)
Baltic countries	1524 (27.6)	0.94 (0.84-1.06)	0.83 (0.73-0.93)
China	1489 (28.2)	0.97 (0.87-1.09)	0.85 (0.75-0.95)
Syria	12749 (24.3)	0.79 (0.76-0.83)	0.90 (0.86-0.94)
Nordic countries	2863 (28.4)	0.98 (0.90-1.07)	0.94 (0.87-1.03)
Poland	4144 (30.6)	1.09 (1.02-1.17)	0.97 (0.90-1.04)
Other countries	42773 (30.7)	1.10 (1.07-1.12)	1.01 (0.99-1.03)
Afghanistan	2956 (29.3)	1.03 (0.95-1.11)	1.03 (0.94-1.12)
Turkey	3174 (32.4)	1.19 (1.10-1.28)	1.04 (0.96-1.13)
Somalia	13221 (29.1)	1.02 (0.98-1.06)	1.07 (1.02-1.12)
Fr Yugoslavia	9163 (27.8)	0.95 (0.91-1.00)	1.08 (1.03-1.13)
India	1388 (33.3)	1.23 (1.10-1.38)	1.12 (0.99-1.26)
Iraq	12303 (31.9)	1.16 (1.11-1.21)	1.15 (1.11-1.20)
Iran	2837 (38.9)	1.57 (1.46-1.70)	1.30 (1.20-1.41)

Adjusted OR (95% CI)

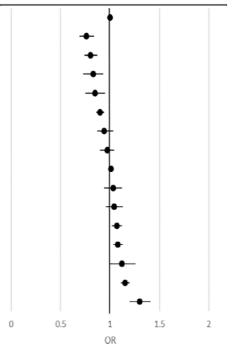


FIGURE 3 Forest plots with analysis and odds ratios for specialized out-patient clinic visits within 16 weeks postpartum in primiparous (A) and multiparous (B).

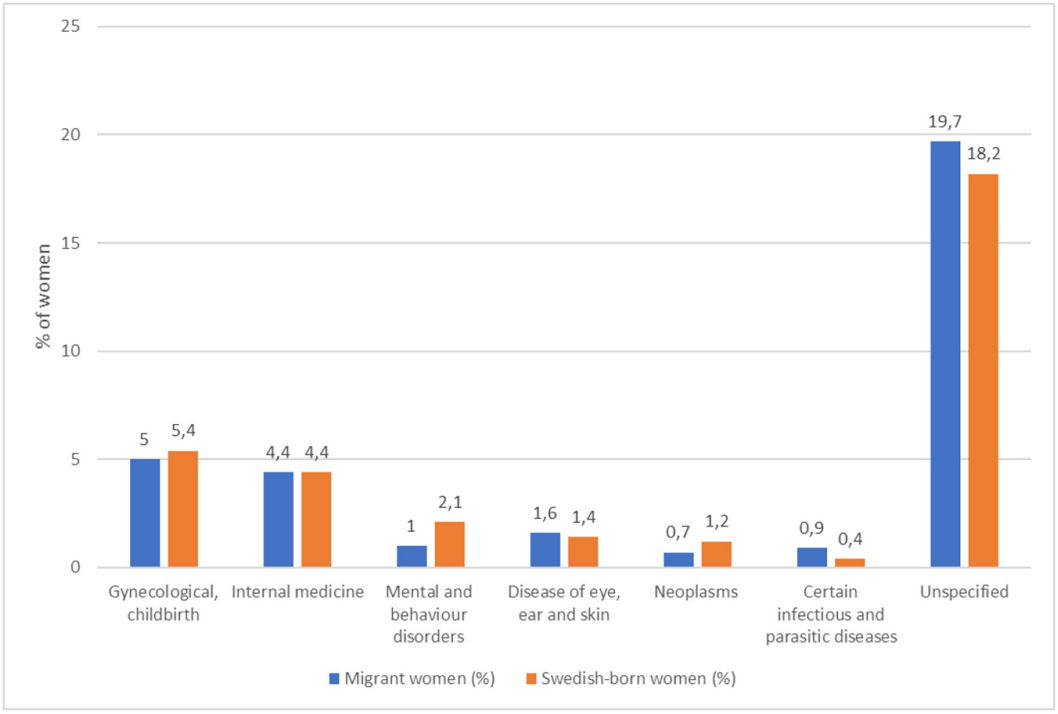


FIGURE 4 Bar chart with reasons (ICD-10) for hospital readmission and/or specialized out-patient clinic visits within 16 weeks postpartum among migrant and Swedish-born women.

their partner to contact a healthcare provider.[37] Migrant women face additional barriers to equality care, such as language difficulties, health illiteracy, and discrimination.[14,15] This emphasizes the need for tailored and comprehendible information, professional interpreters,[38] or other support persons, such as community-based bilingual doulas.[39] However, our findings also suggest that other explanations may be relevant in this diverse population. The lower odds for readmission and for out-patient clinic visits among women from Poland and the Baltic countries, and the higher odds for >48 h hospital stays and high specialized out-patient care for Somali- and Eritrean-born women indicate the importance of exploring postpartum healthcare utilization more in-depth, to ascertain equity in the access to postpartum care.

Subgroups of migrant women would likely benefit from additional time or more suitable care in the postpartum ward, with round-the-clock support available. Appropriate language assistance is essential to provide good and safe care in a person-centered manner to women unfamiliar with Swedish maternity care, routines, and culture.[40] However, it requires time and resources. In Swedish postpartum care, interpreters are primarily made available at the time of discharge when extensive information is provided by the midwife. A recent Norwegian face-to-face questionnaire study of 401 newly arrived migrant women from European and Central Asian regions, South Asia and North Africa/the Middle East showed that one-third of women reported poor understanding of the information given to them during maternity care.[41] The most insufficiently covered topics were related to postpartum

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care, such as infant formula feeding and postpartum mood changes. It is possible that community-based bilingual doulas for language and cultural interpretation, improved access to interpretation services, improved pedagogical material or "postpartum care plan" would improve the quality of care and overall well-being for mothers and shorten the stays in postpartum wards, but this needs further investigation.

The main strengths of this population-based study include the large sample size, which covers approximately 95% of the total population during the study period, its ability to account for dependency between births to the same mother during the study period, and its use of standardized register data. The restriction imposed by Statistics Sweden, which limits reporting to women from the 16 countries (Sweden included) that contributed to the most births during the study period, may have hidden important information about subgroups of women with particularly high or low use of care. Additionally, refugees, who are at high risk for health problems,[15] are not included in the sample due to the lack of a national identity number. The visit rates in specialized out-patient clinics may be underestimations due to potential under-reporting in primary care, especially in consultations with midwives and nurses. However, we believe that the under-reporting has affected the groups equally and not biased the conclusions about associations. There were some obvious errors in the data. The same woman occurred as primiparous several times ($n = 1232$), also at different years of birth. We did not correct these errors, due to a concern that this might affect migrant women differently than the Swedish-born ones leading to a bias in the association between country of birth and care consumption.

5 | CONCLUSION

The use of Swedish health care during the postpartum period varied among women, depending on their country of birth. Women from certain countries had particularly high odds of postpartum hospital stays exceeding 48 h, compared to Swedish-born women, regardless of parity and pre-gestational medical disorders. Further studies are needed to determine whether the individual needs of migrant women are being met during the postpartum period or not.

AUTHOR CONTRIBUTIONS

The study was designed by Malin Berbres, Elin Ternström, Susanne Hesselman, and Erica Schytt. Data management and statistical analysis were performed by Malin Berbres, Elin Ternström and Erica Schytt, with assistance from statistician. MB wrote the initial draft, and all authors provided critical input on result interpretation and the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare that are relevant to the content of this article.

ETHICS STATEMENT

The Swedish Ethical Review Authority approved the study (Dnr: 2020–02384) on June 23, 2020.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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