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Emergency cesarean section among women in Robson groups one and three: A comparison study of immigrant and Norwegian women giving birth in a low-risk maternity hospital in Norway

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ABSTRACT

Researchers have shown that some immigrant groups have an increased risk of emergency cesarean section. The authors' aim was to examine the differences in emergency cesarean section rates among immigrant women in Norway with low obstetric risks by using the Robson classification system. We performed secondary analysis on a Norwegian cohort study, where 10,125 women were classified in Robson groups one and three. Women from East, Southeast, and Central Asia, and from Africa had a higher risk of emergency cesarean section. The Robson classification system was a useful tool in comparing cesarean section rates between immigrant groups and host country populations.

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Background

As many other Western countries, Norway has experienced a large increase in the immigrant population over the last decades. In this population-based study, we used the Robson classification system to examine differences in emergency cesarean section (CS) rates among immigrant women with low obstetric risk. Robson classification system is a highly used tool for comparing CS rates; however, it has hardly been used in studies of immigrant women. Our study contributes to increased knowledge on immigrant women's need for more targeted maternity care.

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This study has used data from the Medical Birth Registry of Norway. The interpretation and reporting of these data is the sole responsibility of the authors, and no endorsement by the Medical Birth Registry of Norway is intended nor should be inferred.

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A CS is a medical procedure intended to prevent maternal and perinatal mortality and morbidity. However, CS is associated with short-term risks, such as complications from the anesthesia, lacerations of the uterus, cervix, and bladder, major blood loss, and infections (Zelop & Heffner, 2004). The long-term complications include placental abruptions, placenta previa, and abnormal adherent placentation in subsequent pregnancies (Zelop & Heffner, 2004). CS rates have increased in most countries during the past decades (OECD, 2018). Even though Norway is at the lower end of the scale globally, with 16.2% in 2016 compared to 20.3% in Denmark and 29.2% in Australia, the rate has steadily increased from 13% in 2000 (OECD, 2018). A Scandinavian study found that the increase in CS rates between 2000 and 2011 was mainly explained by the increased number of women who had previously had a CS and by the increased rate of induction of labor for first-time mothers (Pyykönen et al., 2017). This distinction was performed using the Robson classification system, a system which classifies women into 10 groups based on their obstetric characteristics (parity, previous CS, gestational age, onset of labor, fetal presentation, and the number of fetuses) (Robson, 2001). Based on a systematic review of available classifications for CS, the World Health Organization (WHO) proposed the Robson classification system as a global standard for assessing, monitoring, and comparing CS rates within health-care facilities over time and between facilities (WHO, 2015).

Migrant women originating from Africa, some Asian countries, and Latin America have been found to have an increased risk of emergency CS relative to native populations in Scandinavia (Bakken, Skjeldal, & Stray-Pedersen, 2015; Malin & Gissler, 2009; Vangen, Stoltenberg, Skrondal, Magnus, & Stray-Pedersen, 2000) and in other high-income countries (Merry, Small, Blondel, & Gagnon, 2013; Merry, Vangen, & Small, 2016). Evidence suggests that the reasons for this are complex and likely to include combinations of factors related to the quality of the women's care, their physical and emotional health, as well as social and cultural conditions (Bakken et al., 2015; Higginbottom et al., 2013; Merry et al., 2016). However, few studies have used the Robson classification system to differentiate on obstetric risk, even though it is now widely used in general research on CS, and further research into indications for CS among immigrants is needed (Merry et al., 2016).

A previous study from the same population group in Norway found that immigrant women of African descent had an increased risk of emergency CS (Bakken et al., 2015). We want to examine this more closely by using the Robson classification system. Our aim is to explore disparities in emergency CS rates between immigrant and Norwegian women with a low obstetric risk, defined using the Robson classification system and looking specifically at those in Robson groups one and three (Box 1).

Methods

This population-based cohort study included data on the first registered birth for mothers who delivered at Baerum Hospital in Norway from January 1, 2006 to December 31, 2013: a total of 14,257 women. In cases of a twin birth, only the first-born twin was included, with the second-born twin excluded. We included the women who were classified in Robson groups one and three, as described in [Box 1](#) (Robson, 2001), in the main analyses, involving 10,125 women.

Box 1. The Robson 10-group classification system (Robson, 2001).

1. **Nulliparous, singleton, cephalic, ≥ 37 weeks' gestation, in spontaneous labor**
2. Nulliparous, singleton, cephalic, ≥ 37 weeks' gestation, induced labor or cesarean section before labor
3. **Multiparous (excluding previous cesarean section), singleton, cephalic, ≥ 37 weeks' gestation, in spontaneous labor**
4. Multiparous (excluding previous cesarean section), with singleton, cephalic pregnancy, ≥ 37 weeks' gestation, induced or cesarean section before labor
5. Multiparous, previous cesarean section, singleton, cephalic, ≥ 37 weeks' gestation
6. Nulliparous, singleton, breech
7. Multiparous, singleton, breech (including previous cesarean section)
8. Multiple pregnancies (including previous cesarean section)
9. All women with a single pregnancy in transverse lie (including those with previous cesarean section)
10. All singleton, cephalic, ≤ 36 weeks' gestation pregnancies (including previous cesarean section)

In Norway all pregnant women have access to free maternity care organized by the public health-care system. Baerum Hospital is located near Oslo and the maternity ward is a first-level maternity unit with no neonatal intensive care unit (NICU). It is considered to be a low-risk maternity ward. The Medical Birth Registry of Norway (MBRN), in which all births in Norway are recorded, was used to identify study participants and obtain the information on pregnancy and childbirth. Statistics Norway, the Norwegian statistics bureau, provided information on the maternal and paternal country of birth, descendancy, immigrant generation, and age at immigration, which came from the Norwegian Directorate of Immigration, as well as information on maternal education from the Norwegian Tax Administration. A de-identified file was then sent to the research team.

For the purpose of this study, a woman's country of origin was determined based on the woman's own country of birth, her mother's, or her father's country of birth. In cases where the woman's parents had different countries of birth, we chose the mother's country of birth. We divided the

women into seven groups, primarily based on the geographical regions defined by the United Nations Statistics Division: Norway; Eastern Europe; Latin America and the Caribbean; East, Southeast, and Central Asia; South and Western Asia; and Africa. Another group comprised the women from Western Europe, including the Nordic countries, as well as North America, Australia, and New Zealand.

Measures and statistical analysis

The main outcome measure was emergency CS. A CS is classified as an emergency CS when it is decided that there are less than 8 h to birth. The variable CS was provided by the MBRN and divided into three categories: elective, emergency, and unspecified. We recoded the variable into a dichotomous variable on whether an emergency CS was performed or not.

We examined if there were differences in the distribution of emergency CS in women in Robson groups one and three by migration indicators (country of origin, maternal duration of residency [<2 and ≥ 2 years], and place of birth [Norway or outside of Norway, which included second-generation immigrants]), socioeconomic factors (marital status [married, cohabiting, or single] and educational level [≥ 12 years, <12 years, or undocumented]), and obstetric factors (maternal age [25–34, <25 , or ≥ 35 years], parity [0 or ≥ 1], maternal diabetes [diabetes mellitus type 1 or 2 or gestational diabetes, dichotomous], maternal anemia [hemoglobin levels < 9 g/dL measured during pregnancy, dichotomous], birth weight of baby [2.5–4.5, <2.5 , or >4.5 kg], and transferal of baby to an NICU [dichotomous]).

We created a multiple stepwise logistic regression model of emergency CS to estimate odds ratio (OR) with 95% confidence intervals (CI) of emergency CS for each migrant group in reference to the ethnic Norwegians. We adjusted for covariates that had a statistically significant p -value from our first analyses by examining the distribution of emergency CS by migration indicators, socioeconomic, and obstetric factors. Model 1 included the variable parity (nulliparous as reference), model 2 included the variable from model 1 in addition to maternal educational level (≥ 12 years as reference). The final model, model 3, included the variables from model 2 in addition to the variables maternal diabetes (no as reference) and the baby's birth weight in grams. No interactions were detected between the variables included in the regression model.

Finally, we compared mothers who had an emergency CS in two of the migrant groups (East, Southeast, and Central Asia and Africa) to Norwegian mothers, including maternal and neonatal characteristics. Here

we used the variables of maternal age in years and the baby's birth weight in kilograms.

Crosstab analyses with the Pearson's chi-square test or Fisher's exact test were used to identify risk factors for emergency CS and compare the immigrant groups to Norwegians. We also used Pearson's chi-square test for trends in variables with multiple categories. Continuous variables were analyzed using the one-way Anova test.

Due to missing birth weight information, the total number of included women in the logistic regression model was reduced by three. Missing information in the variable educational level was recoded to the category undocumented to include these women in the regression analyses.

Ethical considerations

Using data from the MBRN in research is referred to in the legislative act governing health records and processing health information in Norway. It was not necessary to obtain informed consent from the participants, as their personal identification numbers were removed. However, as the study used information from the Population Database and from the National Education Database, permission to link information from the MBRN and Statistics Norway was obtained from the Regional Committees for Medical and Health Research Ethics (REC South East; Ref no 2012/267). The MBRN identified the study participants, and we received a file containing non-identifying information.

Results

The distribution of women in the 10 Robson groups was different in all the immigrant groups compared to the Norwegian women, with the exception of the women from Western Europe, including the Nordic countries, North America, Australia, and New Zealand (Table 1). The rates of emergency CS within Robson group one differed from the Norwegians to the women originating from East, Southeast, and Central Asia, and from Africa with increased rates of 11.6% and 12.7% respectively, compared to 7.2% in the Norwegian group. No statistically significant difference was found between the immigrant groups when compared to the Norwegian women in Robson group three.

Exploring the distribution of emergency CS by migration indicators, socioeconomic, and obstetric factors, we found that women with a short duration of residency in Norway, less than 2 years, and women born outside of Norway had an emergency CS more often than those who had been resident in Norway for longer. This was also the case for first-time mothers,

Table 1. Distribution of women giving birth at Baerum Hospital from 2006 to 2013 in the Robson 10-group classification system by country/region of origin, $N = 14,257$.

	The Robson 10-group classification										p value ^c
	1	2	3	4	5	6 + 7 + 9 ^a	8	10 ^b	Reference		
Norway ($n = 8228$)	2990 (36.6)	609 (7.4)	2863 (34.8)	498 (6.1)	625 (7.6)	344 (4.2)	89 (1.1)	210 (2.6)			
Western Europe, North America, Australia, and New Zealand ($n = 2071$)	769 (37.1)	147 (7.1)	719 (34.7)	116 (5.6)	163 (7.9)	86 (4.2)	34 (1.6)	37 (1.8)		.211	
Eastern Europe ($n = 1295$)	584 (45.1)	117 (9.0)	362 (28.0)	63 (4.9)	82 (6.3)	52 (4.0)	10 (0.8)	25 (1.9)		<.001	
Latin America and the Caribbean ($n = 243$)	100 (41.2)	21 (8.6)	60 (24.7)	15 (6.2)	30 (12.3)	11 (4.5)	2 (0.8)	4 (1.6)		.018	
East, Southeast, and Central Asia ($n = 635$)	284 (44.7)	36 (5.7)	187 (29.4)	19 (3.0)	53 (8.3)	21 (3.3)	8 (1.3)	27 (4.3)		<.001	
South and Western Asia ($n = 1006$)	342 (34.0)	78 (7.8)	349 (34.7)	53 (5.3)	93 (9.2)	32 (3.2)	8 (0.8)	51 (5.1)		<.001	
Africa ($n = 779$)	213 (27.3)	58 (7.4)	307 (39.4)	54 (6.9)	104 (13.4)	15 (1.9)	8 (1.0)	20 (2.6)		<.001	

Data are presented as n (%) unless indicated otherwise.

^aIncludes women in Robson groups six, seven, and nine.

^bDelivery ward is a low-risk maternity ward with no neonatal intensive care unit, therefore preterm deliveries <35 weeks are transferred to another hospital before birth.

^cPearson's chi-square test for trend in reference to the Norwegian group.

Table 2. Distribution of emergency cesarean section in Robson groups one and three by migration indicators and socioeconomic and obstetric factors.

	N	Emergency cesarean section		p value ^a
		n	%	
Country/region of maternal origin ^b				
Norway	5852	262	4.5	Reference
Western Europe, North America, Australia, and New Zealand	1487	59	4.0	.391
Eastern Europe	946	46	4.9	.597
Latin America and the Caribbean	160	10	6.3	.287
East, Southeast, and Central Asia	470	38	8.1	<.001
South and Western Asia	690	37	5.4	.292
Africa	520	35	6.7	.019
Maternal duration of residency				.011
>2 years	8992	414	4.6	
≤2 years	1069	68	6.4	
Maternal place of birth				.002
Norway ^c	6841	298	4.4	
Outside of Norway	3288	189	5.8	
Maternal age				.137
25 – 34 years	6790	346	5.1	
<25 years	972	38	3.9	
≥35 years	2363	103	4.4	
Parity				<.001
0	5279	395	7.5	
≥1 ^d	4846	92	1.9	
Marital status				.372
Married/co-habitant	9455	450	4.8	
Single	670	37	5.5	
Maternal educational level				.009
≥12 years	6368	276	4.3	
<12 years	3227	177	5.5	
Undocumented	530	34	6.4	
Maternal diabetes ^e				<.001
No diabetes	9973	469	4.7	
Diabetes mellitus type 1, type 2, or gestational diabetes	152	18	11.8	
Maternal anemia ^f				.284
No anemia	9975	477	4.8	
Anemia with hemoglobin levels < 9 g/dL	150	10	6.7	
Birth weight of baby				<.001
2.5 – 4.5 kg	9819	453	4.6	
<2.5 kg	69	6	8.7	
>4.5 kg	234	28	12.0	
Baby transferred to neonatal intensive care				<.001
No transfer	9690	437	4.5	
Transferred to a neonatal intensive care unit	386	49	12.7	

N = 10,125, total number of emergency cesarean sections is 487.

^aPearson's chi-square test and test for trend.

^bMissing information on four women in four different groups.

^cIncluding second-generation immigrants born in Norway.

^dNo previous cesarean section.

^eIncludes mothers with diabetes mellitus type 1 (n = 4), diabetes mellitus type 2 (n = 6), or gestational diabetes (n = 142).

^fHemoglobin level < 9 g/dL measured during pregnancy.

women who were less well educated, and those who had a diabetic disorder (Table 2). Women who gave birth to a low- or a high-weight baby and who had their baby transferred to an NICU were also more likely to have had an emergency CS.

Table 3. Odds ratio of emergency cesarean section in Robson groups one and three by maternal country/region of origin, in reference to ethnic Norwegian mothers; $N = 10,122$, $n = 487$.

Country/region of maternal origin	Model 1		Model 2	Model 3
	Crude	Adjusted for parity	Adjusted for model 1 + maternal educational level	Adjusted for model 2 + maternal diabetes and baby's birth weight
Norway ($n = 5849$) ^a	Reference	Reference	Reference	Reference
Western Europe, North America, Australia, and New Zealand ($n = 1487$)	0.88 (0.66 – 1.18)	0.87 (0.65 – 1.17)	0.86 (0.64 – 1.15)	0.88 (0.65 – 1.17)
Eastern Europe ($n = 946$)	1.09 (0.79 – 1.50)	0.96 (0.70 – 1.33)	0.90 (0.65 – 1.26)	0.92 (0.66 – 1.28)
Latin America and the Caribbean ($n = 160$)	1.42 (0.74 – 2.73)	1.25 (0.65 – 2.41)	1.16 (0.60 – 2.24)	1.17 (0.60 – 2.28)
East, Southeast, and Central Asia ($n = 470$)	1.88 (1.32 – 2.67)	1.70 (1.19 – 2.43)	1.60 (1.11 – 2.30)	1.72 (1.19 – 2.51)
South and Western Asia ($n = 690$)	1.21 (0.85 – 1.72)	1.24 (0.87 – 1.77)	1.13 (0.78 – 1.64)	1.30 (0.89 – 1.89)
Africa ($n = 520$)	1.54 (1.07 – 2.22)	1.78 (1.23 – 2.58)	1.59 (1.08 – 2.34)	1.77 (1.19 – 2.61)

Data are presented as odds ratio with 95% confidence intervals.

^aMissing information on birth weight on three women, n is therefore reduced by three for this analysis.

Adjusting for significant factors in [Table 2](#), the two migrant groups with an increased risk of emergency CS when compared to the Norwegian women were women from East, Southeast, and Central Asia, with an OR of 1.72 (95% CI 1.19–2.51) in the final model, and Africa, with an adjusted OR of 1.77 (95% CI 1.19–2.61) ([Table 3](#)). Women with a CS in the group from East, Southeast, and Central Asia, 71% originate from the Philippines ($n = 13$), Vietnam ($n = 8$), and Thailand ($n = 6$). In the African group, 42.9% ($n = 15$) originate from Somalia.

When we compared the women who had an emergency CS from the two immigrant groups, including women from East, Southeast, and Central Asia, and Africa, with the Norwegian women in the significant factors, we found that women from East, Southeast, and Central Asia were less well educated and more often had their baby transferred to an NICU ([Table 4](#)). The African women were, on average, younger, more often single, less well educated, and more likely to be anemic, while their babies had a lower mean birth weight.

Discussion

Despite having a low obstetric risk, differences in emergency CS were found between immigrant women originating from East, Southeast, and Central Asia, and Africa when compared to Norwegian women. Only one factor, a higher frequency of low educational level, was statistically

Table 4. Comparison of characteristics of 335 mothers and their infants in Robson groups one and three who had emergency cesarean section, by country/region of origin.

	Norway <i>n</i> = 262	East, Southeast, and Central Asia		Africa	
		<i>n</i> = 38	<i>p</i> -value ^a	<i>n</i> = 35	<i>p</i> -value ^a
Maternal age, years, mean (SD)	31.3 (4.1)	31.4 (3.9)	.894 [‡]	27.6 (4.9)	<.001 [‡]
Parity			.467		.482
0	215 (82.1)	33(86.8)		27 (77.1)	
≥1	47 (17.9)	5 (13.2)		8 (22.9)	
Marital status			.750 [†]		.012 [†]
Married/co-habitant	241 (92.0)	36 (94.7)		27 (77.1)	
Single	21 (8.0)	2 (5.3)		8 (22.9)	
Educational level			<.001 [†]		<.001 [†]
≥12 years	180 (68.7)	19 (50.0)		3 (8.6)	
<12 years	82 (31.3)	15 (39.5)		24 (68.6)	
Undocumented	0	4 (10.5)		8 (22.9)	
Maternal health					
Diabetes ^b	8 (3.1)	3 (7.9)	.151 [†]	1 (2.9)	1.000 [†]
Anemia ^c	3 (1.1)	2 (5.3)	.122 [†]	3 (8.6)	.023 [†]
Baby's birth weight (kg), mean (SD)	3.7 (0.5)	3.5 (0.4)	.096 [‡]	3.4 (0.5)	.002 [‡]
Baby transferred to neonatal intensive care	17 (6.5)	7 (18.4)	.020 [†]	2 (5.7)	1.000 [†]

Data are presented as *n* (%) unless indicated otherwise.

^aPearson's chi-square test, [†]Fisher's exact test, or [‡]one-way Anova test in reference to ethnic Norwegian mothers.

^bIncludes mothers with diabetes mellitus type 1 (*n* = 3), type 2 (*n* = 1), or gestational diabetes (*n* = 82).

^cHemoglobin level < 9 g/dL measured during pregnancy.

significantly different for both of these immigrant groups when compared to the Norwegians.

The distribution of women in the different Robson groups also differed between the immigrant groups and the Norwegians, indicating that the Robson classification system is a useful tool in comparing CS rates between different immigrant groups and host country populations. The Robson classification system has also been used to assess other obstetric outcomes in a recent international study and was found to be useful to assess the quality of care (Rossen et al., 2017). A recent Australian study also found that the distribution of women in Robson groups differed between the different country of birth groups, and the highest overall CS rate was found in women from South Asia. These women had consistently higher adjusted CS rates in Robson groups one to four (Trinh, Assareh, Achat, Chua, & Guevarra, 2018). An increased risk of emergency CS is well documented in African immigrant women, and several explanations for this risk have been suggested, such as the high incidence of female genital mutilation (FGM) in these women (The United Nations Children's Fund [UNICEF], 2005). However, the most recent meta-analysis could not conclude whether or not there was a significant difference in the risk of CS between women who had, and had not experienced FGM (Berg, Odgaard-Jensen, Fretheim, Underland, & Vist, 2014; Berg & Underland, 2013). Scandinavian studies have reported that, at times, health-care workers were unsure about the

correct procedures for providing care for infibulated women in labor; therefore, CS was performed in place of de-infibulation (Vangen, Johansen, Sundby, Traeen, & Stray-Pedersen, 2004; Widmark, Tishelman, & Ahlberg, 2002). However, these findings are from the early 2000s, and procedures for handling women with FGM during pregnancy was changed in 2004 (Austveg, 2017). Whether or not this is still true today remains uncertain.

An increased proportion of African women who experience anemia might be the explanation for some of their increased risk seen in our study (Lone, Qureshi, & Emanuel, 2004; Tandu-Umba & Mbangama, 2015). Another factor may be the African women's reduced risk of elective CS found in this cohort and described in an earlier publication (Bakken, Skjeldal, & Stray-Pedersen, 2017). This can be due to their fear of interventions (Essén et al., 2000; Vangen et al., 2004). Furthermore, it is possible that some of these women would have had a planned, rather than an emergency CS if they had received optimal antenatal care and been well informed.

Communication difficulties have been reported to be a major challenge in the provision of maternity care for immigrants (Degni, Suominen, Essén, El Ansari, & Vehviläinen-Julkunen, 2012; Kurth, Jaeger, Zemp, Tschudin, & Bischoff, 2010; Lyberg, Viken, Haruna, & Severinsson, 2012). The failure to use an interpreter may limit a woman's ability to recognize essential signs and symptoms, which may result in misunderstandings and delays in the detection and treatment of serious obstetric complications (Saastad, Vangen, & Frøen, 2007). Vangen, Stoltenberg, Johansen, Sundby, and Stray-Pedersen (2002) posited that communicative problems may be officially defined as potential risk factors for adverse birth outcomes, which understates the importance of routinely using interpreters. Despite this, until recently, there has been little focus on caring for immigrant women in the education of nurses and midwives in Norway. Language barriers may be overcome through the use of well-trained interpreters when required. However, Norwegian studies have reported that interpreters are underutilized in the health-care sector (Kale & Syed, 2010; Le, 2013). Furthermore, the most frequently used interpreters in the metropolitan area were interpreters with no formal qualifications (Linnestad & Buzungu, 2012). In 2013, the Norwegian government published a national strategy that aimed to promote equity in health-care services for immigrants in Norway because care at that time was not equitable (The Ministry of Health and Care Services, 2013). Lyberg et al. (2012) suggested that Norwegian maternity care is not sensitive to the needs of immigrant women. A recent study on immigrant women's experience of maternity care in Norway found that women highlighted language as an important prerequisite for women to have their needs met and to experience co-

determination and recognition (Egge, Kvellestad, & Glavin, 2018). They also suggested that Norwegian maternity care should give more attention to the father's role during pregnancy, birth, and when the baby was born. Lyberg et al. (2012) interviewed midwives and public health nurses who emphasized a need to systematically increase their knowledge on providing maternity care to immigrants, as health-care workers experienced difficulty in managing the diversity of this care (Lyberg et al., 2012). Health-care workers indicated that the different cultures and values represented by migrant women led to difficulties in establishing a trusting relationship and confidence in maternity care. Structural factors, which affect how midwives may care for pregnant immigrants, may limit their ability to adapt to the care. For example, the use of interpreters may be limited so that they cannot offer antenatal classes (labor and birth preparation courses) for women who do not speak Norwegian. Alternatively, information leaflets may not be translated into different languages because of limited resources. Furthermore, seeing that several of these immigrant women are less well educated than the Norwegian women, they might need more substantial information provided in a different way. These issues may be viewed as discrimination because these women are not provided with the same equity of care as Norwegian-speaking women.

In Finland, Somali women have been reported to be satisfied with the health-care services; however, they perceived health-care providers as unfriendly and communication as poor (Degni, Suominen, El Ansari, Vehviläinen-Julkunen, & Essén, 2014). Similarly, in Norway, health-care professionals stated that linguistic difficulties, cultural traditions, and religious beliefs create problems when working with Somali women (Degni et al., 2012). Essén, Binder, and Johnsdotter (2011) determined that Somali women in London expressed fear throughout pregnancy and avoided CS by failing to follow advice or by changing maternity clinics. Obstetric providers have found Somali women's resistance to a CS was stressful in emergency settings, and have stated that Somali women did not understand their advice or the role of preventive medicine. Somali women avoided a CS because of a fear of death, whereas health-care workers wished to prevent death. They suggested the implementation of consultations designed to meet Somali women's specific needs, in which information regarding routine interventions could be provided in addition to general, rather than personalized, advice as to why and when interventions are useful. They also suggest that this information should be discussed with Somali women in a sensitive manner that does not leave them with the belief that something is wrong with the pregnancy.

A multifaceted study in Australia suggested that the maternity care provided for African-born women needed a continuity of health-care workers,

high-quality interpreters, educational strategies for educating women as well as health-care workers, and the provision of psychosocial support to women with refugee backgrounds (Correa-Velez & Ryan, 2012). Information regarding the challenges and gaps in understanding cultural inequities should be considered when developing and providing maternity care for immigrant women in Norway. Interpreter services should be improved, and their use should be critically enhanced in all maternity care facilities because this is a key factor in enabling communication, which may result in the enhancement of women's knowledge, and is likely to create a trusting relationship (Binder, Borné, Johnsdotter, & Essén, 2012). A lack of trust in maternal-care providers may result in late entry into antenatal care, low adherence to recommendations, and inappropriate decision-making (Binder, Johnsdotter, & Essén, 2012).

In conclusion, we found that the Robson classification system is a useful tool for comparing CS between immigrant groups and host country populations. Despite having low obstetric risks, women of African and East, Southeast, and Central Asian descent have an increased risk of an emergency CS compared to Norwegian women. The immigrant woman as a patient who does not speak Norwegian or English is no longer an unusual situation in Norwegian maternity care. Therefore, this usual situation requires guidelines regarding treatment. With guidelines comes responsibility from health-care systems, which makes the facilitation of high-quality care easier. More research is needed on how to facilitate high-quality care for immigrant women.

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References

Austveg, B. (2017). *Kjønnslemlestelse og behandling. Jordmor Sara forteller. [Female genital mutilation and treatment. Midwife Sara tells.]*[Norwegian]. Retrieved from <https://www.>

- fhi.no/publ/2017/kjonnslemlestelse-og-behandling.-jordmor-sara-forteller/. Oslo, Nasjonalt kompetansesenter for migrasjons- og minoritetshelse (NAKMI).
- Bakken, K. S., Skjeldal, O. H., & Stray-Pedersen, B. (2015). Higher risk for adverse obstetric outcomes among immigrants of African and Asian descent: A comparison study at a low-risk maternity hospital in Norway. *Birth*, 42(2), 132–140. doi:10.1111/birt.12165
- Bakken, K. S., Skjeldal, O. H., & Stray-Pedersen, B. (2017). Obstetric outcomes of first- and second-generation Pakistani immigrants: A comparison study at a low-risk maternity ward in Norway. *Journal of Immigrant and Minority Health*, 19(1), 33–40. doi:10.1007/s10903-015-0329-3
- Berg, R. C., Odgaard-Jensen, J., Fretheim, A., Underland, V., & Vist, G. (2014). An updated systematic review and meta-analysis of the obstetric consequences of female genital mutilation/cutting. *Obstetrics and Gynecology International*, 2014, 1. doi:10.1155/2014/542859
- Berg, R. C., & Underland, V. (2013). The obstetric consequences of female genital mutilation/cutting: A systematic review and meta-analysis. *Obstetrics and Gynecology International*, 2013, 1. doi:10.1155/2013/496564
- Binder, P., Borné, Y., Johnsdotter, S., & Essén, B. (2012). Shared language is essential: Communication in a multiethnic obstetric care setting. *Journal of Health Communication*, 17(10), 1171–1186. doi:10.1080/10810730.2012.665421
- Binder, P., Johnsdotter, S., & Essén, B. (2012). Conceptualising the prevention of adverse obstetric outcomes among immigrants using the 'three delays' framework in a high-income context. *Social Science & Medicine*, 75(11), 2028–2036. doi:10.1016/j.socscimed.2012.08.010
- Correa-Velez, I., & Ryan, J. (2012). Developing a best practice model of refugee maternity care. *Women and Birth: Journal of the Australian College of Midwives*, 25(1), 13–22. doi:10.1016/j.wombi.2011.01.002
- Degni, F., Suominen, S., Essén, B., El Ansari, W., & Vehviläinen-Julkunen, K. (2012). Communication and cultural issues in providing reproductive health care to immigrant women: Health care providers' experiences in meeting the needs of [corrected] Somali women living in Finland. *Journal of Immigrant and Minority Health*, 14(2), 330–343. doi:10.1007/s10903-011-9465-6
- Degni, F., Suominen, S. B., El Ansari, W., Vehviläinen-Julkunen, K., & Essén, B. (2014). Reproductive and maternity health care services in Finland: Perceptions and experiences of Somali-born immigrant women. *Ethnicity & Health*, 19(3), 348–366. doi:10.1080/13557858.2013.797567
- Egge, H., Kvellestad, K., & Glavin, K. (2018). Innvandrerkvinnens erfaringer med svangerskap, fødsel og barseltid i Norge - en kvalitativ studie [Immigrant women's experience with pregnancy, birth and the postpartum period in Norway - A qualitative study][Norwegian]. *Nordisk Tidsskrift for Helseforskning*, 14(1), 19 pages. doi:10.7557/14.4295
- Essén, B., Binder, P., & Johnsdotter, S. (2011). An anthropological analysis of the perspectives of Somali women in the West and their obstetric care providers on caesarean birth. *Journal of Psychosomatic Obstetrics and Gynaecology*, 32(1), 10–18. doi:10.3109/0167482X.2010.547966
- Essén, B., Johnsdotter, S., Hovellius, B., Gudmundsson, S., Sjöberg, N. O., Friedman, J., & Östergren, P. O. (2000). Qualitative study of pregnancy and childbirth experiences in Somalian women resident in Sweden. *Bjog: An International Journal of Obstetrics and Gynaecology*, 107(12), 1507–1512. doi:10.1111/j.1471-0528.2000.tb11676.x
- Higginbottom, G., Reime, B., Bharj, K., Chowbey, P., Ertan, K., Foster-Boucher, C., ... Salway, S. (2013). Migration and maternity: Insights of context, health policy, and

- research evidence on experiences and outcomes from a three country preliminary study across Germany, Canada, and the United Kingdom. *Health Care for Women International*, 34(11), 936–965. doi:10.1080/07399332.2013.769999
- Kale, E., & Syed, H. R. (2010). Language barriers and the use of interpreters in the public health services. A questionnaire-based survey. *Patient Education and Counseling*, 81(2), 187–191. doi:10.1016/j.pec.2010.05.002
- Kurth, E., Jaeger, F. N., Zemp, E., Tschudin, S., & Bischoff, A. (2010). Reproductive health care for asylum-seeking women – A challenge for health professionals. *BMC Public Health*, 10, 659. doi:10.1186/1471-2458-10-659
- Le, C. (2013). Når er “litt norsk” for lite? En kvalitativ undersøkelse av tolkebruk i helsetjenesten. [When is “a little Norwegian” too little? A qualitative study of the utilisation of interpreters in the healthcare sector.][Norwegian]. NAKMI Report 2/2013. Oslo, Nasjonal kompetanseenhet for minoritetshelse.
- Linnestad, H., & Buzungu, H. F. (2012). *Ikke lengre 'en tjeneste av ukjent kvalitet'. Statusrapport om tolkefeltet i helsevesenet i hovedstadsområdet. [No longer "a service of unknown quality." Status Report on interpreting field of health care in the metropolitan area][Norwegian].* Oslo: Oslo Municipality and South-Eastern Norway Regional Health Authority.
- Lone, F. W., Qureshi, R. N., & Emanuel, F. (2004). Maternal anaemia and its impact on perinatal outcome. *Tropical Medicine & International Health*, 9(4), 486–490. doi:10.1111/j.1365-3156.2004.01222.x
- Lyberg, A., Viken, B., Haruna, M., & Severinsson, E. (2012). Diversity and challenges in the management of maternity care for migrant women. *Journal of Nursing Management*, 20(2), 287–295. doi:10.1111/j.1365-2834.2011.01364.x
- Malin, M., & Gissler, M. (2009). Maternal care and birth outcomes among ethnic minority women in Finland. *BMC Public Health*, 9, 84. doi:10.1186/1471-2458-9-84
- Merry, L., Small, R., Blondel, B., & Gagnon, A. J. (2013). International migration and caesarean birth: A systematic review and meta-analysis. *BMC Pregnancy Childbirth*, 13, 27. doi:10.1186/1471-2393-13-27
- Merry, L., Vangen, S., & Small, R. (2016). Caesarean births among migrant women in high-income countries. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 32, 88–99. doi:10.1016/j.bpobgyn.2015.09.002
- OECD. (2018). OECD Health Statistics 2018 – Frequently Requested Data – Caesarean sections, per 1,000 live births. Retrieved from <http://www.oecd.org/els/health-systems/health-statistics.htm>
- Pyykönen, A., Gissler, M., Løkkegaard, E., Bergholt, T., Rasmussen, S. C., Smáráson, A., ... Tapper, A.-M. (2017). Cesarean section trends in the Nordic Countries – A comparative analysis with the Robson classification. *Acta Obstetrica et Gynecologica Scandinavica*, 96(5), 607–616. doi:10.1111/aogs.13108
- Robson, M. S. (2001). Classification of caesarean sections. *Fetal and Maternal Medicine Review*, 12(1), 23–39. doi:10.1017/S0965539501000122
- Rossen, J., Lucovnik, M., Eggebø, T. M., Tul, N., Murphy, M., Vistad, I., & Robson, M. (2017). A method to assess obstetric outcomes using the 10-Group Classification System: A quantitative descriptive study. *BMJ Open*, 7(7), e016192. doi:10.1136/bmjopen-2017-016192
- Saastad, E., Vangen, S., & Frøen, J. F. (2007). Suboptimal care in stillbirths – A retrospective audit study. *Acta Obstetrica et Gynecologica Scandinavica*, 86(4), 444–450. doi:10.1080/00016340701207724

- Tandu-Umba, B., & Mbangama, A. M. (2015). Association of maternal anemia with other risk factors in occurrence of Great obstetrical syndromes at university clinics, Kinshasa, DR Congo. *BMC Pregnancy & Childbirth*, *15*, 183. doi:10.1186/s12884-015-0623-z
- The Ministry of Health and Care Services. (2013). *Likeverdige helse- og omsorgstjenester - god helse for alle. Nasjonal strategi om innvandreres helse 2013-2017 [Equitable health care services – Good health for all. National Strategy on Immigrants' Health 2013-2017][Norwegian]*. Oslo: The Ministry of Health and Care Services.
- Trinh, L. T. T., Assareh, H., Achat, H., Chua, S., & Guevarra, V. (2018). Caesarean section among immigrants with different obstetrical risks. *International Journal of Nursing Practice*, *24*(3), e12638. doi:10.1111/ijn.12638
- The United Nations Children's Fund (UNICEF). (2005). Female genital mutilation/cutting. A statistical exploration 2005. Retrieved from <https://data.unicef.org/resources/female-genital-mutilationcutting-a-statistical-exploration/>.
- Vangen, S., Johansen, R. E., Sundby, J., Traeen, B., & Stray-Pedersen, B. (2004). Qualitative study of perinatal care experiences among Somali women and local health care professionals in Norway. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, *112*(1), 29–35. doi:10.1016/S0301-2115(03)00313-0
- Vangen, S., Stoltenberg, C., Johansen, R. E. B., Sundby, J., & Stray-Pedersen, B. (2002). Perinatal complications among ethnic Somalis in Norway. *Acta Obstetrica et Gynecologica Scandinavica*, *81*(4), 317–322. doi:10.1080/j.1600-0412.2002.810407.x
- Vangen, S., Stoltenberg, C., Skrondal, A., Magnus, P., & Stray-Pedersen, B. (2000). Cesarean section among immigrants in Norway. *Acta Obstetrica et Gynecologica Scandinavica*, *79*(7), 553–558. doi:10.1080/j.1600-0412.2000.079007553.x
- Widmark, C., Tishelman, C., & Ahlberg, B. M. (2002). A study of Swedish midwives' encounters with infibulated African women in Sweden. *Midwifery*, *18*(2), 113–125. doi:10.1054/midw.2002.0307
- World Health Organization (WHO) (2015). WHO Statement on Caesarean Section Rates. Available from http://apps.who.int/iris/bitstream/10665/161442/1/WHO_RHR_15.02_eng.pdf?ua=1.
- Zelop, C., & Heffner, L. (2004). The downside of cesarean delivery: Short- and long-term complications. *Clinical Obstetrics and Gynecology*, *47*(2), 386–393. doi:10.1097/00003081-200406000-00012