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Type of Attendant at Birth by Detailed Maternal Nativity Among US-Born, Latin American and Caribbean-Born, and Sub-Saharan African-Born Black Women

Farida N. YADA [1,2,*], Candace S. Brown [3], Larissa R. Brunner Huber [3], Comfort Z. Olorunsaiye [4], Ndidiamaka Amutah-Onukhaga [1,2] and Tehia Starker Glass [5]

[1] Department of Public Health & Community Medicine, Tufts University School of Medicine, Boston, MA 02111, USA
[2] Center for Black Maternal Health and Reproductive Justice, Tufts University School of Medicine, Boston, MA 02111, USA
[3] Department of Epidemiology and Community Health, College of Health and Human Services, UNC Charlotte, Charlotte, NC 28223, USA
[4] Department of Public Health, College of Health Sciences, Arcadia University, Glenside, PA 19038, USA
[5] Department of Reading and Elementary Education, Cato College of Education, UNC Charlotte, NC 28223, USA
* Correspondence: farida.yada@tufts.edu

Abstract: Approximately 10% of the US Black diaspora were born either in Latin America and the Caribbean (LAC) or Sub-Saharan Africa (SSA), projected to account for a third of the Black US diaspora by 2060. Yet little details on foreign-born Black women's labor and delivery (L&D) characteristics such as the type of birth attendant remain scarce. We used the National Center for Health Statistics 2016 to 2020 Natality data (n=2,041,880). The associations between detailed maternal nativity (DMN) and the type of attendant at birth (i.e., physician, certified nurse-midwife (CNM), certified professional midwife (CPM)) among US-born, LAC-born, and SSA-born Black women were examined using multivariate multinomial regression. The study revealed that LAC-born women were more likely to have a CNM during birth than US-born Black women, but Haitian-born and Jamaican-born women had lower odds of having a certified professional midwife (CPM) at birth. When compared to US-born Black women, Cameroonian-born women had decreased odds of having either a CNM or CPM during birth. Findings suggest the need for further investigation and comprehensive data collection methods for future research to understand the specific needs and preferences of different ethnocultural groups to improve maternity care and prevent adverse maternal health outcomes.

Keywords: detailed maternal nativity; labor and delivery; birth attendant; Black women; US-born; Latin American and Caribbean-born; Sub-Saharan African-born

1. Introduction

Between 2017-2019, 84% of pregnancy-related deaths in the US were preventable [1]. It is well documented that Black women in the US are three to four times more likely to die in childbirth than their non-Black counterparts, even after adjusting for relevant social determinants of health such as age, socioeconomic status, and parity [2]. A complex interplay of factors, including systemic racism, socioeconomic barriers, lack of access to quality healthcare [3] and immigration-related disadvantages often contribute to these disparities [3,4]. However, another factor that may also contribute to these disparities is maternal nativity.

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Black people are not a monolith; therefore culture, ethnicity, and immigration characteristics must be considered in the study of Black people's reproductive health. In 2019, 47 million people in the US identified as Black, comprising 14% of the total US population among which 4.6 million were foreign-born [5]. Among Black immigrants in the US, those who identify as Caribbean (46%) are the largest group, while Sub-Saharan African (SSA) (42%) immigrants account for the fastest growth in the Black immigrant population [6–8]. Notwithstanding their contributions to the growing US Black Diaspora, Latin American and Caribbean, and SSA-born women are underrepresented in current maternity research and scientific literature.

The birthing process can involve a diverse group of maternity care providers including obstetricians, family physicians, nurse-midwives, and doulas [9,10]. Midwifery involves the provision of comprehensive care throughout pregnancy, childbirth, and postpartum, including addressing sexual and reproductive health, gynecologic needs, preconception care, and family planning [11]. The American College of Nurse-Midwives (ACNM) defines a Certified Nurse Midwife (CNM) as a maternity care provider educated at the graduate-level accredited midwifery programs who are also active registered nurses at the time of their midwifery certification [12]. Both CNMs and Certified Midwives (CMs) have graduate-level education, receive certification through the ACNM, and their services include a full range of primary care services for women starting from adolescence to post menopause [13]. Certified professional midwife (CPM) certification is governed by the North American Registry of Midwives (NARM) and does not require an academic degree [13]. The scope of practice for CPMs includes education, support, counseling, assessment, diagnosis and treatment of abnormal or dangerous conditions during the perinatal period [13]. While physicians attend the majority of births, there is a notable state-by-state variation in the use of midwifery care [14]. Access to midwifery care is significantly lower in states with higher rates of Black births [14,15]. Various certifications and regulations exist for midwives, which affect their scope of practice, autonomy, and prescriptive authority. The Midwifery Integration Scoring System (MISS) quantifies the integration of midwifery care and its impact, with findings suggesting that higher integration correlates with better maternal and neonatal outcomes [13,14]. These maternal outcomes include higher rates of spontaneous vaginal delivery, vaginal birth after cesarean, and breastfeeding, and the neonatal outcomes include lower rates of cesarean deliveries, preterm birth, low birth weight infants and neonatal deaths [13,14]. Racism in midwifery is a significant factor to consider in addressing maternity care inequities. Black women in the US often served as midwives, delivering babies for both enslaved and White women, until the Sheppard-Towner Act of 1921 resulted in regulation and gradual elimination of Black midwives in the Southern US [15–17]. Due to higher rates of maternal mortality and morbidity and other adverse birth outcomes among women of color, Black women, in particular, have propelled interest in evidence-based models of care that can improve outcomes, that include access to midwifery care and preventive care programs developed and led by midwives [19,20].

The existing literature on associations between maternal nativity and labor and delivery (L&D) characteristics among Black women is limited. Most studies have dichotomized maternal nativity, i.e., US-born versus foreign-born, without examining associations by specific countries of birth [21–24]. Disparities in maternal health between US-born and foreign-born Black people are larger than nativity disparities among all other racialized populations (e.g., between US-born and foreign-born Asian populations) [26]. Additionally, previous research primarily focused on adverse birth outcomes such as preterm birth and low birth weight [26–28], while potential factors that may pertain to differences in L&D care within the Black Diaspora, such as detailed maternal nativity (DMN) and the type of attendant at birth, remain underexplored.

This study aimed to address the gaps in the existing literature by examining associations between DMN (i.e., mother's specific country of birth) and the type of attendant at birth among US-born, LAC-born, and SSA-born Black women in the US who had a birth between 2016 and 2020. We sought to assess differences in the type of attendant at birth between LAC-born and SSA-born Black mothers in comparison to US-born Black mothers. Due to the lack of access to midwifery care in states

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with higher rates of Black births [15], it was hypothesized that LAC-born and Sub-Saharan Africa (SSA)-born women would have lower odds of being attended by midwives compared to their US-born counterparts.

2. Materials and Methods

2.1. Data Source

The Centers for Disease Control and Prevention (CDC) National Center for Health Statistics (NCHS) collaborates with states to collect and publish data on vital statistics, including all US live births, death certificates, and fetal death reports [30]. Birth certificate data, often referred to as Natality data, records births within the US, covering US citizens, residents, and non-residents. Public use Natality data, micro-data files, are available on the NCHS website [30]. However, due to confidentiality concerns, specific geographic data such as the state of residence or maternal country of birth are restricted [31]. To study the associations between DMN and the type of attendant at birth, access to the all-county restricted micro-data natality files for 2016 – 2020 was secured from NCHS.

2.2. Ethics

The UNC Charlotte Institutional Review Board (IRB) deemed this study exempt from needing IRB approval as there was no human participation. Following the submission of a brief proposal of research objectives, and a data security plan, NCHS granted access to the datasets.

2.3. Study Design & Population

The initial sample included non-Hispanic Black adult women of reproductive age (20-49) [32], who had a singleton birth in the US between 2016 and 2020 (n=2,556,727). Women who had missing data on their nativity status (n=9,085), were non-US residents (n=2,558), were born in regions other than the US, the LAC, or SSA (n=31,696), or did not have a singleton delivery (n=108,428) were excluded. Women who had missing or incomplete information on the following independent variables were also excluded: US region of residence (n=91,063), marital status (n=80,157), mother's education (n=16,400), parity (n=7,582), BMI (n=67,788), method of delivery (n= 773), prenatal care adequacy (n=80,709), or previous cesarean (n= 1,206). Lastly, women whose place of delivery was unknown (n=1,674), and women whose attendant at birth was listed as "other" or "unknown" (n=15,728) were excluded. The final sample included 2,041,880 deliveries.

2.4. Study Variables

The main exposure in this study was DMN, i.e., the mother's region and country of birth (Table 1). The mother's detailed nativity was determined by the birth country variable available on the child's Birth Certificate Record. Black women who indicated being born in the LAC, or sub-Saharan Africa were compared to US-born Black women who were the reference group. Individual countries with lower than 5,000 observations were collapsed into two composite variables called "All Other" for the LAC and SSA respectively [32,33]. The outcome measure was the type of attendant at birth (i.e., physician, certified nurse midwife (CNM), or other midwife (CPM)).

The covariates included maternal age (20-29, 30-39, 40-49), mother's education (some high school, high school graduate, some college, college degree, or unknown), marital status (married or unmarried), parity (1, 2, ≥3), gestational weight gain (according to the Institute of Medicine guidelines) [35], adequacy of prenatal care (adequate, intermediate, or inadequate), previous cesarean delivery, insurance type, US region of residence (Northeast, Midwest, South or West), and location of residence (urban vs rural). Prenatal care adequacy was measured using the Adequacy of Prenatal Care Utilization Index [35,36]. The month prenatal care began and the number of prenatal care visits variables were used to create the following categories: Adequate = began care between 1-4 months, and had at least 15 prenatal visits at 40 weeks, Intermediate = began care between 1-4

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months and had ≤11 prenatal visits, and Inadequate = began care at or after the 5th month, and had ≤6 prenatal visits [36].

Table 1. Frequencies of US-born, Latin American and Caribbean-born (LAC), and Sub-Saharan African (SSA)-born Black Women, 2016-2020 NCHS Natality Data.

Mother's Birth Country		
US	1,732,603	(84.85)
Latin America & Caribbean		
Anguilla	68	(0.00)
Antigua Barbuda	446	(0.02)
Aruba	20	(0.00)
Barbados	569	(0.03)
Belize	540	(0.03)
Brazil	1,005	(0.05)
Cayman Islands	78	(0.00)
Columbia	73	(0.00)
Cuba	80	(0.00)
Dominican Republic	1,070	(0.05)
Ecuador	43	(0.00)
El Salvador	150	(0.01)
French Guyana	13	(0.00)
Grenada	523	(0.02)
Guadeloupe	72	(0.00)
Guatemala	255	(0.01)
Guyana	3,347	(0.16)
Haiti	**51,948**	**(2.54)**
Jamaica	**31,112**	**(1.52)**
Martinique	28	(0.00)
Netherland Antilles	6	(0.00)
Nicaragua	49	(0.00)
Panama	315	(0.02)
Panama Canal Zone	5	(0.00)
Papua New Guinea	11	(0.00)
Paraguay	2	(0.00)
Peru	33	(0.00)
Saint Lucia	702	(0.03)
The Bahamas	2,908	(0.14)
Trinidad and Tobago	4,236	(0.21)

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Turks & Caicos Islands	233	(0.01)
Uruguay	9	(0.00)
Venezuela	92	(0.00)

Sub-Saharan Africa		
Angola	873	(0.04)
Benin	860	(0.04)
Botswana	118	(0.01)
Burkina Faso	1,089	(0.05)
Burundi	1,476	(0.07)
Cameroon	**9,725**	**(0.48)**
Cape Verde	3,415	(0.16)
Central African Republic	292	(0.01)
Chad	269	(0.01)
Comoros	14	(0.00)
Congo	3,347	(0.16)
Democratic Republic of Congo (DRC)	**11,039**	**(0.52)**
Côte D'Ivoire	2,780	(0.14)
Djibouti	479	(0.02)
Equatorial Guinea	203	(0.01)
Eritrea	4,429	(0.23)
Ethiopia	**29,322**	**(1.46)**
Gabon	398	(0.02)
Gambia	1,807	(0.09)
Ghana	**17,233**	**(0.83)**
Guinea-Bissau	68	(0.00)
Kenya	**13,143**	**(0.64)**
Kingdom of eSwatini	33	(0.00)
Lesotho	27	(0.00)
Liberia	**10,021**	**(0.49)**
Madagascar	79	(0.00)
Malawi	328	(0.02)
Mali	1,177	(0.06)
Maldives	1	(0.00)
Mauritius	15	(0.00)
Mozambique	85	(0.00)
Niger	530	(0.03)
Nigeria	**42,497**	**(2.11)**

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Rwanda	1,480	(0.07)
Sao Tome & Principe	7	(0.00)
Senegal	2,800	(0.14)
Seychelles	7	(0.00)
Sierra Leone	3,938	(0.19)
Somalia	**26,422**	**(1.29)**
South Africa	941	(0.05)
SU Sudan	**6,793**	**(0.33)**
Tanzania	1,843	(0.09)
Togo	3,066	(0.15)
Uganda	2,654	(0.14)
Zambia	814	(0.04)
Zimbabwe	1,200	(0.06)

2.5. Statistical Analysis

LAC-born and SSA-born women were compared to Black US-born Black women. Comparisons were also made between LAC-born and SSA-born Black women and by maternal country of birth within the LAC and within SSA countries (e.g., Haiti vs All Other LAC, Nigeria vs All Other SSA) [33]. To describe the sample, univariate analyses were conducted using frequencies for categorical variables and group differences were tested using Pearson Chi-square tests. Unadjusted odds ratios and 95% confidence intervals were calculated using multinomial regression to obtain the crude association between DMN and the type of attendant at birth. Multivariate multinomial regression models were used to obtain adjusted odds ratios and 95% confidence intervals for the association between DMN and the type of attendant at birth (Table 4) while controlling for potential confounders. Variables that changed the crude odds ratio estimates by a minimum of 10% were included in the multivariate models [38]. The final model was adjusted for age, marital status, education, insurance, and region of residence in the US; All analyses were conducted in SAS software version 9.4 [39].

3. Results

Approximately 85% of the Black women who had a singleton delivery between 2016 and 2020 were US-born and 15% were foreign-born (Table 1). Of the foreign-born women, 10.24% were from SSA, and 4.87% were from LAC (Tables 2.1a, 2.1b) with the highest number of births among them from women born in Nigeria and Haiti. The overall geographic distribution was predominantly in the Southern US. Most US-born Black women giving birth were aged 20-29 (55.50%), 44.78% had some level of higher education, and 63.80% were unmarried. Among foreign-born Black women, most were in the 30-39 age group (8.85%), 9.19% had some level of higher education, and 4.58% were unmarried. In the overall sample, 64.07% of the deliveries were covered by Medicaid. Ninety-one percent of all deliveries were attended by a physician, and less than 1% occurred in out-of-hospital settings.

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Table 2.1a. Comparison of Demographic Characteristics of Latin American and Caribbean-born (LAC) Black women by country of birth, 2016-2020 NCHS Natality Data.

	Haiti	Jamaica	All Other LAC	*p* value[a]
	N= 51,948	N= 31,112	N= 16,981	
	(2.54)	(1.52)	(0.83)	
Variables				
Maternal Age				<.0001
20-29	17,907	11,768	5,840	
	(0.88)	(0.58)	(0.29)	
30-39	29,214	29,214	9,815	
	(1.43)	(0.82)	(0.48)	
4049	4,827	2,666	1,326	
	(0.24)	(0.13)	(0.06)	
Marital Status				<.0001
Married	34,402	17,037	10,112	
	(1.68)	(0.83)	(0.50)	
Not Married	17,546	14,075	6,869	
	(0.86)	(0.69)	(0.34)	
Mother's Education				<.0001
Less Than High School	7,754	1,370	986	
	(0.38)	(0.07)	(0.05)	
High School or GED	18,347	8,644	4,534	
	(0.90)	(0.42)	(0.22)	
Some College or College	23,614	17,609	8,966	
Degree	(1.16)	(0.86)	(0.44)	
Graduate Degree	2,233	3,489	2,495	
	(0.11)	(0.17)	(0.12)	
Parity				<.0001
1	17,242	11,889	6,363	
	(0.84)	(0.58)	(0.31)	
2	16,705	10,261	5,699	
	(0.82)	(0.50)	(0.28)	
≥3	18,001	8,962	4,919	
	(0.88)	(0.44)	(0.24)	
Gestational Weight Gain				<.0001
Met	15,749	9,202	5,169	
	(0.77)	(0.45)	(0.25)	
Below	16,178	6,885	4,126	
	(0.79)	(0.34)	(0.20)	
Exceeded	20,021	15,025	7,686	

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	(0.98)	(0.74)	(0.38)	
Prenatal Care Adequacy				<.0001
Adequate	32,140	20,928	11,115	
	(1.57)	(1.02)	(0.54)	
Intermediate	6,672	3,602	2,063	
	(0.33)	(0.18)	(0.10)	
Inadequate	13,136	6,582	3,803	
	(0.64)	(0.32)	(0.19)	
Insurance Type				<.0001
Medicaid	30,047	12,782	6,261	
	(1.47)	(0.63)	(0.31)	
Private	14,690	13,867	7,971	
	(0.72)	(0.68)	(0.39)	
Self-Pay	5,384	2,801	1,831	
	(0.26)	(0.14)	(0.09)	
Other	1,827	1,662	918	
	(0.09)	(0.08)	(0.04)	
Region of Residence				<.0001
Northeast	15,911	11,668	5,234	
	(0.78)	(0.57)	(0.26)	
Midwest	1,562	1,413	859	
	(0.08)	(0.07)	(0.04)	
South	33,933	17,353	10,258	
	(1.66)	(0.85)	(0.50)	
West	542	678	630	
	(0.03)	(0.03)	(0.03)	
Location of Residence				<.0001
Urban	51,938	17	16,946	
	(2.54)	(1.52)	(0.83)	
Rural	10	31,095	35	
	(0.00)	(0.00)	(0.00)	
Previous Cesarean				<.0001
Yes	10,201	4,802 (0.24)	3,010	
	(0.50)		(0.15)	
No	41,747	26,310	13,971	
	(2.04)	(1.29)	(0.68)	
Attendant Type				<.0001
Physician/Doctor	44,393	27,510	15,169	
	(2.17)	(1.35)	(0.74)	
Certified Nurse-Midwife	7,297	3,444	1,678	
(CNM)	(0.36)	(0.17)	(0.08)	
Other Midwife (CPM)	258	158	134	

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	(0.01)	(0.01)	(0.01)	
Place of Birth				<.0001
Hospital	51,755	30,921	16,814	
	(0.82)	(2.53)	(2.53)	
Freestanding Birthing	86	94	95	
Center	(0.00)	(0.00)	(0.00)	
Home (intended)	87	80	65	
	(0.00)	(0.00)	(0.00)	
Home (not intended)	20	17	7	
	(0.00)	(0.00)	(0.00)	
Method of Delivery				<.0001
Vaginal	30,667	19,256	10,437	
	(1.50)	(0.94)	(0.51)	
Cesarean	21,281	11,856	6,544	
	(1.04)	(0.58)	(0.32)	

[a] p values refer to a Pearson Chi-square test for the differences by maternal country of birth.

Table 2.1b. Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data.

	Cameroon	**DRC**	**Ethiopia**	**Kenya**	**Liberia**	**Ghana**	**Nigeria**	**Sudan**	**Somalia**	**All Other SSA**	***p* value[a]**
	N= 9,725 (0.48)	N= 11,039 (0.54)	N= 29,322 (1.44)	N= 13,143 (0.64)	N= 10,021 (0.49)	N= 17,233 (0.84)	N= 42,497 (2.08)	N= 6,793 (0.33)	N= 26,422 (1.29)	N= 43,041 (2.11)	
Variables											
Maternal Age											<.0001
20-29	3,614 (0.18)	5,393 (0.26)	8.977 (0.44)	5,612 (0.27)	4,255 (0.21)	4,516 (0.22)	10,404 (0.51)	2,378 (0.12)	9,727 (0.48)	16,894 (0.83)	
30-39	5,568 (0.27)	5,090 (0.25)	18,261 (0.89)	6,507 (0.32)	5,286 (0.26)	11,414 (0.56)	29,109 (1.43)	3,870 (0.19)	15,223 (0.75)	23,130 (1.13)	
40-49	543 (0.03)	556 (0.03)	2,084 (0.10)	1,024 (0.05)	480 (0.02)	1,303 (0.06)	2,984 (0.15)	545 (0.03)	1,472 (0.07)	3,017 (0.15)	
Marital Status											<.0001
Married	7,204 (0.35)	8,358 (0.41)	20,726 (1.02)	9,304 (0.46)	5,283 (0.26)	12,860 (0.63)	36,809 (1.80)	5,568 (0.27)	20,147 (0.99)	30,207 (1.48)	
Not Married	2,521 (0.12)	2,681 (0.13)	8,596 (0.42)	3,839 (0.19)	4,738 (0.23)	4,373 (0.21)	5,688 (0.28	1,225 (0.06)	6,275 (0.31)	12,834 (0.63)	
Mother's Education											<.0001
Less Than High School	293 (0.01)	3,008 (0.15)	4,852 (0.24)	987 (0.05)	1,078 (0.05)	486 (0.02)	902 (0.04)	1,336 (0.07)	12,932 (0.63)	7,658 (0.38)	
High School or GED	1,490 (0.07)	4,040 (0.20)	9,131 (0.45)	2,568 (0.13)	3,585 (0.18)	3,402 (0.17)	4,678 (0.23)	1,749 (0.09)	7,075 (0.35)	11,224 (0.55)	
Some College or College Degree	6,101 (0.30)	3,696 (0.18)	13,661 (0.67)	7,946 (0.39)	4,865 (0.24)	10,376 (0.51)	26,415 (1.29)	3,232 (0.16)	6,084 (0.30)	19,885 (0.97)	
Graduate Degree	1,841 (0.09)	295 (0.01)	1,678 (0.08)	1,642 (0.08)	493 (0.02)	2,969 (0.15)	10,502 (0.51)	476 (0.02)	331 (0.02)	4,274 (0.21)	
Parity											<.0001
1	3,392 (0.17)	3,051 (0.15)	9,527 (0.47)	402 (0.23)	2,532 (0.12)	5,665 (0.28)	14,413 (0.71)	1,445 (0.07)	3,804 (0.19)	14,124 (0.69)	

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2	3,123 (0.15)	2,686 (0.13)	9,968 (0.49)	4,436 (0.22)	2,934 (0.14)	5,734 (0.28)	13,700 (0.67)	1,532 (0.08)	4,145 (0.20)	13,237 (0.65)	
≥3	3,210 (0.16)	5,302 (0.26)	9,827 (0.48)	4,005 (0.20)	4,555 (0.22)	5,834 (0.29)	14,384 (0.70)	3,816 (0.19)	18,473 (0.90)	15,680 (0.77)	
Gestational Weight Gain											<.0001
Met	2,769 (0.14)	3,399 (0.17)	10,192 (0.50)	4,318 (0.21)	2,898 (0.14)	5,374 (0.26)	13,504 (0.66)	2,049 (0.10)	7,915 (0.39)	13,287 (0.65)	
Below	1,826 (0.09)	3,785 (0.19)	8,733 (0.43)	4,157 (0.20)	2,579 (0.13)	4,349 (0.21)	10,610 (0.52)	2,623 (0.13)	11,451 (0.56)	13,300 (0.65)	
Exceeded	5,130 (0.25)	3,855 (0.19)	10,397 (0.51)	4,668 (0.23)	4,544 (0.22)	7,510 (0.37)	18,383 (0.90)	2,121 (0.10)	7,056 (0.35)	16,454 (0.81)	
Prenatal Care Adequacy											<.0001
Adequate	6,298 (0.31)	6,178 (0.30)	18,056 (0.88)	8,271 (0.41)	6,629 (0.32)	11,939 (0.58)	21,994 (1.08)	4,098 (0.20)	15,000 (0.73)	26,387 (1.29)	
Intermediate	1,001 (0.05)	1,025 (0.05)	3,637 (0.18)	1,645 (0.08)	1,255 (0.06)	1,788 (0.09)	3,747 (0.18)	820 (0.04)	4,508 (0.22)	4,557 (0.22)	
Inadequate	2,426 (0.12)	3,836 (0.19)	7,629 (0.37)	3,227 (0.16)	2,137 (0.10)	3,506 (0.17)	16,756 (0.82)	1,875 (0.09)	6,914 (0.34)	12,097 (0.59)	
Insurance Type											<.0001
Medicaid	4,662 (0.23)	7,409 (0.36)	16,647 (0.82)	5,837 (0.29)	5,442 (0.27)	6,786 (0.33)	13,668 (0.67)	4,138 (0.20)	21,734 (1.06)	22,650 (1.11)	
Private	3,994 (0.20)	2,440 (0.12)	10,729 (0.53)	6,030 (0.30)	3,718 (0.18)	8,385 (0.41)	14,307 (0.70)	2,090 (0.10)	430 (0.19)	15,320 (0.75)	
Self-Pay	545 (0.03)	926 (0.05)	989 (0.05)	705 (0.03)	436 (0.02)	1,139 (0.06)	12,501 (0.61)	369 (0.02)	3,830 (0.02)	3,005 (0.15)	
Other	524 (0.03)	264 (0.01)	957 (0.05)	571 (0.03)	425 (0.02)	923 (0.05)	2,021 (0.10)	196 (0.01)	428 (0.02)	2,066 (0.10)	
Region of Residence											<.0001
Northeast	1,170 (0.06)	1,522 (0.07)	2,865 (0.14)	2,223 (0.11)	2,737 (0.13)	5,365 (0.26)	6,106 (0.30)	947 (0.05)	2,009 (0.10)	10,911 (0.53)	
Midwest	1,670 (0.08)	3,397 (0.17)	7,803 (0.38)	4,250 (0.21)	3,970 (0.19)	3,382 (0.17)	6,709 (0.33)	2,332 (0.11)	18,126 (0.89)	10,143 (0.50)	
South	6,392 (0.31)	4,376 (0.21)	12,800 (0.63)	4,852 (0.24)	2,726 (0.13)	7,548 (0.37)	27,830 (1.36)	2,540 (0.12)	2,713 (0.13)	17,704 (0.87)	
West	493 (0.02)	1,744 (0.09)	5,854 (0.29)	1,818 (0.09)	588 (0.03)	938 (0.05)	1,852 (0.09)	974 (0.05)	3,574 (0.18)	4,283 (0.21)	
Location of Residence											<.0001
Urban	9,724 (0.48)	11,010 (0.54)	29,312 (1.44)	13,129 (0.64)	10,013 (0.49)	17,221 (0.84)	42,481 (2.08)	6,791 (0.33)	26,419 (1.29)	43,006 (2.11)	
Rural	1 (0.00)	29 (0.00)	10 (0.00)	14 (0.00)	8 (0.00)	12 (0.00)	16 (0.00)	2 (0.00)	3 (0.00)	35 (0.00)	
Previous Cesarean											<.0001
Yes	1,895 (0.09)	1,872 (0.09)	6,893 (0.34)	2,543 (0.12)	2,069 (0.10)	4,156 (0.20)	9,124 (0.45)	1,573 (0.08)	6,121 (0.30)	8,046 (0.39)	
No	7,830 (0.38)	9,167 (0.45)	22,429 (1.10)	10,600 (0.52)	7,952 (0.39)	13,077 (0.64)	33,373 (1.63)	5,220 (0.26)	20,301 (0.99)	34,995 (1.71)	
Attendant Type											<.0001
Doctor	9,084 (0.44)	9,968 (0.49)	26,583 (1.30)	11,728 (0.57)	8,978 (0.44)	15,880 (0.78)	39,851 (1.95)	6,191 (0.30	21,844 (1.07)	38,365 (1.88)	
CNM	613 (0.03)	1024 (0.05)	2690 (0.13)	1354 (0.07)	1014 (0.05)	1316 (0.06)	2425 (0.12)	578 (0.03)	4545 (0.22)	4398 (0.22)	
CPM	28 (0.00)	47 (0.00)	49 (0.00)	61 (0.00)	29 (0.00)	37 (0.00)	221 (0.01)	24 (0.00)	33 (0.00)	278 (0.01)	
Place of Birth											<.0001
Hospital	9,703 (0.48)	11,026 (0.54)	29,274 (1.43)	13,081 (0.64)	10,001 (0.49	17,186 (0.84)	42,236 (2.07)	6,776 (0.33)	26,387 (1.29)	42,886 (2.10)	
Freestanding Birthing Center	12 (0.00)	4 (0.00)	23 (0.00)	32 (0.00)	12 (0.00)	20 (0.00)	181 (0.01)	8 (0.00)	14 (0.00)	68 (0.00)	

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Home (intended)	7 (0.00)	3 (0.00)	10 (0.00)	23 (0.00)	6 (0.00)	11 (0.00)	66 (0.00)	4 (0.00)	7 (0.00)	58 (0.00)	
Home (not intended)	3 (0.00)	6 (0.00)	15 (0.00)	7 (0.00)	(0.00)	16 (0.00)	14 (0.00)	5 (0.00)	14 (0.00)	29 (0.00)	
Method of Delivery											<.0001
Vaginal	5,944 (0.29)	7,601 (0.37)	17,293 (0.85)	8,151 (0.40)	6,229 (0.31)	9,892 (0.48)	24,684 (1.21)	4,626 (0.23)	19,940 (0.98)	28,260 (1.38)	
Cesarean	3,781 (0.19)	3,438 (0.17)	12,029 (0.59)	4,992 (0.24)	3,792 (0.19)	7,341 (0.36)	17,813 (0.87)	2,167 (0.11)	6,482 (0.32)	14,781 (0.72)	

[a] p values refer to a Pearson Chi-square test for the differences by maternal country of birth.

Overall, LAC-born Black women had increased odds of having either a CNM or a CPM at delivery compared to women who were attended by physicians. and these findings were statistically significant (ORs ranged from 1.30 - 2.31) (Table 3). Among SSA-born women, Cameroonian-born Black women had decreased odds of having either a CNM (OR= 0.80; 95% CI: 0.73-0.86), or a CPM (OR= 0.80; 95% CI: 0.55-1.17), compared to US-born Black women. Ghanaian-born and Nigerian-born women had increased odds of having a CNM at delivery (OR(G)= 1.19; 95% CI: 1.15-1.24) and OR(N)=1.33; 95% CI: 1.25-1.42) respectively but decreased odds of having a CPM (OR(G)= 0.48; 95% CI: 0.36-0.64) and OR(N)=0.84; 95% CI: 0.58-1.21) respectively compared to US-born Black women.

After adjusting for age, marital status, education, insurance, and region of residence in the US, LAC-born women continued to have increased odds of having a CNM at delivery at a reduced magnitude compared to women who had a physician-attended birth (Table 4). However, Haitian-born women now had 40% reduced odds of having a CPM at delivery (OR= 0.60; 95% CI: 0.53-0.69), and Jamaican-born women had 34% reduced odds of having a CPM at delivery (OR= 0.66; 95% CI: 0.56-0.77). The women in All Other LAC countries also had decreased odds of having a CPM at delivery but this finding was no longer statistically significant after adjustment (OR= 0.88; 95% CI: 0.74-1.05). The associations observed among Cameroonian-born women continued to demonstrate statistically significantly decreased odds of having either a CNM or CPM at delivery compared to women who had physician-attended births; however, findings were attenuated after adjustment. After adjustment, Ghanaian-born and Nigerian-born women now had significantly decreased odds of having a CNM at delivery (OR(G)= 0.90; 95% CI: 0.85-0.95) and OR(N)= 0.67; 95% CI: 0.64-0.70; respectively) and decreased odds of having a CPM (OR(G)= 0.25; 95% CI: 0.18-0.34) and OR(N)= 0.15; 95% CI: 0.13-0.18; respectively) compared to women who were attended by physicians. and these findings were statistically significant.

Table 3. Unadjusted Odds Ratios and 95% Confidence Intervals for the Association between detailed maternal nativity and attendant at birth.

	Attendant at Birth (Ref. Physician) **Unadjusted ORs**	
	Certified Nurse-Midwife (CNM) OR (95% CI)	**Other Midwife (CPM) OR (95% CI)**
Variables		
Mothers' Nativity		
Born in US	1.00 (Referent)	1.00 (Referent)
Foreign-Born	1.39 (1.37-1.41)	1.29 (1.22-1.37)
Mother's Birth Country		
US	1.00 (Referent)	1.00 (Referent)
	Latin America & Caribbean	
Haiti	1.94 (1.89-1.99)	1.52 (1.34-1.72)
Jamaica	1.47 (1.42-1.53)	1.50 (1.28-1.75)

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All Other LAC	1.30 (1.24-1.37)	2.31 (1.94-2.74)
	Sub-Saharan Africa	
Cameroon	0.80 (0.73-0.86)	0.80 (0.55-1.17)
DRC	1.21 (1.13-1.30)	1.23 (0.92-1.64)
Ethiopia	1.21 (1.13-1.30)	1.23 (0.92-1.64)
Ghana	1.19 (1.15-1.24)	0.48 (0.36-0.64)
Kenya	0.98 (0.92-1.03)	0.61 (0.44-0.84)
Liberia	1.36 (1.29-1.44)	1.36 (1.05-1.75)
Nigeria	1.33 (1.25-1.42)	0.84 (0.58-1.21)
Somalia	0.72 (0.69-0.75)	1.45 (1.26-1.65)
Sudan	2.45 (2.37-2.53)	0.39 (0.28-0.56)
All Other SSA	1.09 (1.01-1.19)	1.01 (0.68-1.51)
Maternal Age		
20-29	1.00 (Referent)	1.00 (Referent)
30-39	0.85 (0.84-0.86)	1.19 (1.14-1.25)
40-49	0.65 (0.62-0.67)	0.80 (0.69-0.93)
Marital Status		
Married	1.17 (1.16-1.18)	2.46 (2.35-2.57)
Not Married	1.00 (Referent)	1.00 (Referent)
Mother's Education		
Less Than High School	1.07 (1.05-1.09)	0.34 (0.30-0.38)
High School or GED	1.01 (1.00-1.10)	0.48 (0.45-0.50)
Some College or College Degree	1.00 (Referent)	1.00 (Referent)
Graduate Degree	0.87 (0.85-0.89)	1.41 (1.31-1.51)
Parity		
1	0.99 (0.98-1.00)	1.05 (1.00-1.11)
2	1.01 (1.00-1.02)	0.99 (0.93-1.04)
≥3	1.00 (Referent)	1.00 (Referent)
Gestational Weight Gain		
Met	1.01 (1.09-1.12)	1.14 (1.08-1.20)
Below	1.07 (1.06-1.08)	0.85 (0.80-0.90)
Exceeded	1.00 (Referent)	1.00 (Referent)
Prenatal Care Adequacy		
Adequate	1.00 (Referent)	1.00 (Referent)
Intermediate	1.14 (1.12-1.16)	0.89 (0.83-0.96)
Inadequate	1.07 (1.06-1.08)	1.12 (1.07-1.19)
Insurance Type		
Medicaid	1.00 (Referent)	1.00 (Referent)
Private	0.92 (0.91-0.93)	1.18 (1.11-1.25)
Self-Pay	1.21 (1.18-1.25)	14.15 (13.36-14.98)
Other	1.70 (1.65-1.73)	2.42 (2.19-2.68)
Region of Residence		
Northeast	1.61 (1.59-1.63)	0.58 (0.54-0.63)
Midwest	1.20 (1.18-1.21)	0.37 (0.34-0.40)
West	1.77 (1.73-1.81)	1.08 (0.98-1.19)
South	1.00 (Referent)	1.00 (Referent)
Location of Residence		
Urban	1.00 (Referent)	1.00 (Referent)
Rural	0.60 (0.55-0.65)	0.37 (0.22-0.63)

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Previous Cesarean		
Yes	0.16 (0.16-0.17)	0.18 (0.16-0.20)
No	1.00 (Referent)	1.00 (Referent)

p value <0.05.

Table 4. Adjusted Odds Ratios and 95% Confidence Intervals for the association between detailed maternal nativity and attendant at birth.

	Attendant at Birth (Ref. Physician)	
	Certified Nurse-Midwife	**Other Midwife (CPM)**
	OR 95% CI	**OR 95% CI**
Variables		
Mother's Birth Country		
US	*1.00 (Referent)*	*1.00 (Referent)*
	Latin America & Caribbean	
Haiti	1.86 (1.81-1.91)	0.60 (0.53-0.69)
Jamaica	1.38 (1.33-1.43)	0.66 (0.56-0.77)
All Other LAC	1.24 (1.18-1.31)	0.88 (0.74-1.05)
	Sub-Saharan Africa	
Cameroon	*0.77 (0.71-0.84)*	*0.31 (0.22-0.46)*
DRC	*1.05 (0.98-1.12)*	*0.54 (0.40-0.72)*
Ethiopia	*1.11 (1.07-1.16)*	*0.31 (0.23-0.41)*
Ghana	*0.90 (0.85-0.95)*	*0.25 (0.18-0.34)*
Kenya	*1.22 (1.15-1.29)*	*0.67 (0.52-0.87)*
Liberia	*1.20 (1.12-1.28)*	*0.64 (0.44-0.92)*
Nigeria	*0.67 (0.64-0.70)*	*0.15 (0.13-0.18)*
Somalia	*2.20 (2.12-2.28)*	*0.53 (0.38-0.75)*
Sudan	*0.99 (0.91-1.08)*	*0.49 (0.33-0.74)*
All Other SSA	*1.20 (1.16-1.24)*	*0.88 (0.78-1.00)*

Model adjusted for age, marital status, education, insurance, and region of residence in the US. p value <0.05.

4. Discussion

This study explored the associations between DMN and the type of attendant at birth among US-born, LAC-born, and SSA-born Black women who had a delivery in the US between 2016 and 2020. Contrary to the initial hypotheses, findings revealed that after adjusting for age, marital status, education, and insurance status, LAC-born women generally had increased odds of being attended by a CNM at delivery compared to U.S.-born women. In contrast, all foreign-born women had decreased odds of being attended by a CPM supporting our hypotheses. SSA-born women, particularly women from Cameroon, Ghana, Kenya, Liberia, Nigeria, and Somalia exhibited varying associations for the odds of being attended by a CNM. Cameroonian, Ghanaian, and Nigerian-born women had decreased odds of having a CNM at delivery. In contrast, Kenyan, Liberian, and Somalian-born women had increased odds of being attended by a CNM. These findings align with

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previous research which showed notable differences in L&D characteristics including the place and method of delivery by DMN across the US Black diaspora [40].

To our knowledge, this is the first study to examine the association between DMN and the type of attendant at birth among a nationally representative sample of US-born, SSA-born, and LAC-born Black mothers. However, previous research which can help contextualize the current findings has examined associations between maternal nativity and L&D practices [41], as well as the association between racial segregation and adverse birth outcomes including preterm birth and low birth weight [42]. In a 2022 study of Black mothers in New York City (n=135,701), authors found differences in the incidence of low birthweight and preterm births with the lowest rates among African-born and Latin American and LAC-born Black mothers when compared to US-born Black mothers. It is possible that the mechanisms influencing differences in birth outcomes by nativity such as cultural norms could also influence the association between DMN and the type of attendant at birth [33,42].

4.1. Limitations and Strengths

This study has several limitations. One limitation is the potential for nondifferential misclassification, particularly regarding the type of birth attendant. Previous research suggests that midwife-attended birth numbers might be underreported on birth certificates, especially when multiple providers are present or when hospitals mandate listing a physician as the primary attendant regardless of their physical presence at midwife-attended births [42–44]. Thus, findings may be biased toward the null. Findings may have also been influenced by health selection bias. Health selection refers to the degree to which potential immigrants migrate or not based on their health status [45]. Specifically, Sub-Saharan African women might be more likely to migrate to the U.S. based on their positive health status, complicating interpretations of our findings. Previous research has shown that African immigrants were 81% more likely to report having excellent health prior to immigrating to the US [45]. Additionally, this secondary data analysis was limited by the data collected on the birth certificates. Thus, confounding due to a variable not collected on birth certificates is possible.

Despite these limitations, this study had several strengths. First, the impact of DMN on the type of attendant at birth is under-researched and previous studies have typically dichotomized nativity status (US vs foreign-born). One prospective antenatal survey study published in 2010 assessed preferences in L&D practices (including method of delivery, choice of pain relief, place of delivery, position, and mobility in labor) between pregnant Somali and Sudanese immigrants and US-born women (N=93), receiving care at a family practice in New York.[40] The results indicated differences in L&D preferences between US-Born and foreign-born women, however, most were not statistically significant and the authors did not differentiate between White and Black US-born women [40]. In contrast, this study used a race-concordant sample in addition to the granular approach to nativity status and examined specific maternal countries of origin within the two regions contributing the highest number of Black immigrants in the US. This level of detail allows for more nuanced insights and helps to reduce overgeneralizations since Black women are not a monolith. Another of the study's strengths is our use of Natality U.S. Birth Certificate Data across all 50 states, enhancing the generalizability of the findings to U.S.-born, SSA-born, and LAC-born Black mothers who delivered in the U.S. between 2016 and 2020. The study's large sample size also addresses the limitations of previous studies that were limited by small samples.

4.2. Implications

These findings highlight the need for more nuanced research and healthcare policies that consider the specific needs and preferences of different groups of pregnant women based on their ethnocultural origins. The significant changes in some associations after adjustment suggest that public health interventions may need to account for these factors to be effective. For example, efforts to increase access to midwifery care should include support for building and diversifying the midwifery workforce, especially given that states with higher proportions of Black births have the

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lowest midwifery integration scores in the country [15]. Such efforts should also include providing education about the history, and benefits of midwifery care and considering cost coverage for US-born and foreign-born Black women. Different cultural backgrounds might contribute to the differences in the type of attendant at birth characteristics we observed. Understanding the unique needs and experiences of US-born and foreign-born Black women can lead to improved quality of maternity care, patient satisfaction, and potentially eradicate preventable adverse maternal health outcomes. It is therefore crucial for providers to be able to consider nativity to assess, recognize, and respect Black women's L&D preferences and needs.

5. Conclusions

This study underscores the necessity of considering maternal nativity in healthcare planning, especially in the context of L&D services among the growing US Black Diaspora. While we observed some trends consistent with our hypotheses, there were notable exceptions that warrant further investigation. Future studies should focus on more comprehensive data collection methods such as qualitative and mixed-methods research to delve deeper into the underlying mechanisms for the observed differences in the type of attendant at birth among US-born, LAC-born, and SSA-born Black women.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org. Table S1: Comparison of Demographic Characteristics of US-born, Latin American and Caribbean-born (LAC), and Sub-Saharan-born (SSA) Black Women, 2016-2020 NCHS Natality Data; Table S2: Comparison of Demographic Characteristics of Latin American and Caribbean-born (LAC) Black women by country of birth, 2016-2020 NCHS Natality Data; Table S3: Comparison of Demographic Characteristics of Sub-Saharan African (SSA)-born Black women by country of birth, 2016-2020 NCHS Natality Data.

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Informed Consent Statement: Informed consent was not required because the research involved secondary analysis of existing data without identifiable private information.

Data Availability Statement: The datasets presented in this article are not readily available because they contain restricted geographic variables governed by the National Center for Health Statistics (NCHS). Requests to access the datasets should be directed to https://www.cdc.gov/nchs/nvss/dvs_data_release.htm.

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Abbreviations

The following abbreviations are used in this manuscript:

ACNM	American College of Nurse-Midwives
CNM	Certified Nurse Midwife
CPM	Certified Professional Midwife / Other Midwife
L&D	Labor and Delivery
NCHS	National Center for Health Statistics
SSA	Sub-Saharan Africa
DRC	Democratic Republic of Congo

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