

## Appendix 1. Digital Health App Utilization Metrics, in Quantiles, Stratified by Number of Doula Appointments (N = 8,989)

Maven resource	Number of Doula Appointments			Overall (N=8989)	p-value
	None (N=6876)	1 appointment (N=1396)	At least 2 (N=717)		
<b>Articles read</b>					
[0,7]	2117 (30.8%)	202 (14.5%)	64 (8.9%)	2383 (26.5%)	< 0.001
(7,20]	1715 (24.9%)	327 (23.4%)	145 (20.2%)	2187 (24.3%)	
(20,46]	1567 (22.8%)	399 (28.6%)	217 (30.3%)	2183 (24.3%)	
(46,547]	1477 (21.5%)	468 (33.5%)	291 (40.6%)	2236 (24.9%)	
<b>Class recordings watched</b>					
0	3426 (49.8%)	420 (30.1%)	169 (23.6%)	4015 (44.7%)	< 0.001
(0,1]	956 (13.9%)	163 (11.7%)	89 (12.4%)	1208 (13.4%)	
(1,4]	1169 (17.0%)	319 (22.9%)	164 (22.9%)	1652 (18.4%)	
(4,108]	1325 (19.3%)	494 (35.4%)	295 (41.1%)	2114 (23.5%)	
<b>Virtual classes attended</b>					
0	4583 (66.7%)	704 (50.4%)	298 (41.6%)	5585 (62.1%)	< 0.001
(0,1]	864 (12.6%)	220 (15.8%)	129 (18.0%)	1213 (13.5%)	
(1,22]	1429 (20.8%)	472 (33.8%)	290 (40.4%)	2191 (24.4%)	
<b>All appointments attended</b>					
0	2336 (34.0%)	0 (0%)	0 (0%)	2336 (26.0%)	< 0.001
(0,2]	3084 (44.9%)	279 (20.0%)	4 (0.6%)	3367 (37.5%)	
(2,4]	880 (12.8%)	531 (38.0%)	126 (17.6%)	1537 (17.1%)	
(4,118]	576 (8.4%)	586 (42.0%)	587 (81.9%)	1749 (19.5%)	
<b>All messages sent</b>					
0	3109 (45.2%)	103 (7.4%)	18 (2.5%)	3230 (35.9%)	< 0.001
(0,2]	1496 (21.8%)	191 (13.7%)	22 (3.1%)	1709 (19.0%)	
(2,7]	1359 (19.8%)	422 (30.2%)	108 (15.1%)	1889 (21.0%)	
(7,429]	912 (13.3%)	680 (48.7%)	569 (79.4%)	2161 (24.0%)	
<b>CA appointments attended</b>					
0	2743 (39.9%)	118 (8.5%)	46 (6.4%)	2907 (32.3%)	< 0.001
1	3962 (57.6%)	1171 (83.9%)	592 (82.6%)	5725 (63.7%)	
(1,9]	171 (2.5%)	107 (7.7%)	79 (11.0%)	357 (4.0%)	
<b>Messages sent to CA</b>					
0	3433 (49.9%)	186 (13.3%)	35 (4.9%)	3654 (40.6%)	< 0.001
(0,1]	1080 (15.7%)	145 (10.4%)	24 (3.3%)	1249 (13.9%)	
(1,5]	1586 (23.1%)	438 (31.4%)	147 (20.5%)	2171 (24.2%)	
(5,96]	777 (11.3%)	627 (44.9%)	511 (71.3%)	1915 (21.3%)	
<b>Healthcare professional appointments attended</b>					
0	4119 (59.9%)	0 (0%)	0 (0%)	4119 (45.8%)	< 0.001
(0,1]	1267 (18.4%)	258 (18.5%)	0 (0%)	1525 (17.0%)	
(1,3]	929 (13.5%)	564 (40.4%)	129 (18.0%)	1622 (18.0%)	

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(3,117]	561 (8.2%)	574 (41.1%)	588 (82.0%)	1723 (19.2%)	
<b>Messages sent to healthcare professionals</b>					
0	5118 (74.4%)	465 (33.3%)	106 (14.8%)	5689 (63.3%)	< 0.001
(0,2]	897 (13.0%)	395 (28.3%)	128 (17.9%)	1420 (15.8%)	
(2,376]	861 (12.5%)	536 (38.4%)	483 (67.4%)	1880 (20.9%)	

Abbreviations: CA, care advocate  
All summary statistics presented as N(%)

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**Appendix 2. Adjusted Associations (Model 1), Between Doula Utilization and User-Reported Outcomes Among Full Cohort, Stratified by Parity (N = 8,989)**

Outcome	Doula utilization	Overall (N = 8989)		Nulliparous (N = 6244)		Parous, no CS (N = 1651)		Parous, with CS (N = 678)	
		Adjusted OR	N	Adjusted OR	N	Adjusted OR	N	Adjusted OR	N
Cesarean birth	None	1.000	2105	1.000	1379	1.000	138	1.000	493
	Once	0.90 (0.77, 1.04)	401	0.94 (0.80, 1.10)	330	0.77 (0.39, 1.39)	12	0.30 (0.15, 0.61)	36
	At least twice	0.80 (0.65, 0.97)	204	0.85 (0.69, 1.04)	166	0.95 (0.28, 2.47)	6	0.23 (0.11, 0.47)	26
Helped me decide my birth preference	None	1.000	832	1.000	690	1.000	100	1.000	38
	Once	2.71 (2.34, 3.14)	395	2.41 (2.05, 2.83)	325	4.41 (2.89, 6.66)	52	6.74 (3.02, 14.6)	15
	At least twice	4.72 (3.94, 5.65)	293	4.23 (3.49, 5.13)	257	9.24 (4.63, 18.0)	18	10.9 (5.02, 23.7)	17
Received high level of support during pregnancy	None	1.000	2133	1.000	1441	1.000	406	1.000	157
	Once	2.50 (2.20, 2.85)	733	2.47 (2.14, 2.85)	561	2.61 (1.87, 3.66)	99	2.56 (1.31, 4.97)	25
	At least twice	4.88 (4.07, 5.85)	474	4.72 (3.89, 5.75)	390	3.56 (1.90, 6.81)	26	11.80 (5.44, 28.50)	34
Helped me learn medically accurate information	None	1.000	3012	1.000	2220	1.000	475	1.000	223
	Once	1.63 (1.43, 1.85)	802	1.64 (1.42, 1.89)	647	1.75 (1.26, 2.44)	89	1.14 (0.60, 2.16)	24
	At least twice	2.41 (2.02, 2.89)	479	2.51 (2.07, 3.05)	412	1.87 (1.00, 3.50)	24	2.24 (1.15, 4.46)	26
Helped me manage my anxiety or depression	None	1.000	621	1.000	390	1.000	149	1.000	63
	Once	1.54 (1.27, 1.87)	198	1.59 (1.28, 1.97)	155	1.38 (0.85, 2.17)	31	0.87 (0.28, 2.21)	7
	At least twice	2.52 (2.01, 3.13)	141	2.31 (1.79, 2.95)	109	4.26 (2.11, 8.31)	16	3.34 (1.55, 6.93)	14

Abbreviations: BMI, body mass index; CS, cesarean; OR, odds ratio; SVI, social vulnerability index.

Multivariable logistic models adjusted for age, race, SVI, presence of medical conditions, BMI, history of anxiety or depression, current pregnancy-related anxiety, and parity.

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**Appendix 3. Adjusted Associations (Model 1) Between Doula Utilization and User-Reported Outcomes Among Black Users of Maven, Stratified by Parity (N = 530)**

Outcome	Doula utilization	Overall (N = 530)		Nulliparous (N = 318)		Parous (N = 175)	
		Adjusted OR	N	Adjusted OR	N	Adjusted OR	N
Cesarean birth	None	1.000	141	1.000	79	1.000	53
	Once	0.90 (0.52, 1.54)	40	1.06 (0.58, 1.92)	34	0.26 (0.05, 1.07)	6
	At least twice	0.41 (0.19, 0.88)	14	0.43 (0.18, 0.96)	10	0.27 (0.02, 3.76)	4
Helped me decide my birth preference	None	1.000	53	1.000	37	1.000	14
	Once	2.33 (1.35, 3.99)	33	2.42 (1.29, 4.54)	26	2.62 (0.79, 8.11)	7
	At least twice	3.79 (1.94, 7.39)	25	4.21 (2.05, 8.73)	23	1.75 (0.08, 13.0)	2
Received high level of support during pregnancy	None	1.000	139	1.000	64	1.000	57
	Once	2.43 (1.51, 3.95)	58	2.30 (1.30, 4.11)	37	3.94 (1.56, 10.70)	19
	At least twice	7.39 (3.66, 16.10)	46	7.05 (3.31, 16.2)	35	10.00 (1.53, 199.00)	8
Helped me learn medically accurate information	None	1.000	166	1.000	90	1.000	67
	Once	1.99 (1.25, 3.22)	44	2.36 (1.34, 4.25)	49	1.71 (0.70, 4.28)	16
	At least twice	3.12 (1.62, 6.33)	67	3.93 (1.89, 8.75)	35	1.13 (0.22, 6.42)	6
Helped me manage my anxiety or depression	None	1.000	319	1.000	24	1.000	16
	Once	1.66 (0.84, 3.17)	92	1.12 (0.46, 2.55)	10	3.03 (0.96, 9.18)	7
	At least twice	3.28 (1.57, 6.68)	43	2.58 (1.07, 6.01)	11	13.6 (2.45, 85.5)	4

Abbreviations: BMI, body mass index; CS, cesarean; OR; odds ratio; SVI, social vulnerability index

Multivariable logistic models adjusted for age, race, social vulnerability index, presence of medical conditions, body mass index, history of anxiety or depression, current pregnancy-related anxiety, parity, and previous cesarean birth.

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