

**Table IV. Maternal morbidity associated to spontaneous vaginal and assisted vaginal deliveries by instrument used**

Modified from Demissie, et al		Neonatal and maternal morbidity by mode of delivery (New Jersey, 1989-93).		
Maternal morbidity	Unassisted (n=327 373)	Forceps (n=26 491)	Vacuum (n=19 120)	
Third degree perineal tear	12 359 (377.5)	3316 (1251.7)	1840 (962.3)	
Adjusted odds ratio (95% CI)	0.39 (0.38 to 0.41)	1.00	0.78 (0.73 to 0.83)	
Fourth degree perineal tear	6626 (202.4)	2584 (975.4)	1199 (627.1)	
Adjusted odds ratio (95%CI)	0.28 (0.27 to 0.30)	1.00	0.64 (0.60 to 0.69)	
Postpartum haemorrhage	4734 (144.6)	517 (195.1)	458 (239.5)	
Adjusted odds ratio (95% CI)	0.79 (0.72 to 0.87)	1.00	1.22 (1.07 to 1.39)	

Modified from Gardella , et al Incidence of maternal morbidity associated with assisted vaginal deliveries by vacuum, forceps, or vacuum and forceps compared with spontaneous vaginal deliveries, (Washington state, 1996)

	Incidence among spontaneous vaginal deliveries (N = 11,223)*	Assisted vaginal deliveries			
		Vacuum (N = 3741)		Forceps (N = 3741)	
		Incidence*	RR	Incidence*	RR
Vaginal laceration					
Nulliparas	17.1	22.9	1.3 (0.9-1.9)	47.0	2.7 (2.1-3.7)
Multiparas	6.2	10.9	1.8 (0.9-1.0)¶	19.1	3.1 (1.8-5.3)#
Third-degree laceration					
Nulliparas	72.8	140.0	1.9 (1.7-2.2)	157.7	2.2 (1.9-2.5)
Multiparas	12.8	57.4	4.5 (3.3-6.1)±	55.3	4.3(3.1-6.0)±
Fourth-degree laceration					
Nulliparas	23.7	36.9	1.6(1.2-2.1)	35.7	1.5(1.2-2.0)
Multiparas	3.5	9.3	2.7 (1.3-5.5)§	12.8	3.7 (1.9-7.4)
Cervical laceration†	2.3	4.8	1.7 (0.9-3.3)	5.9	2.2 (1.2-3.8)
Postpartum hemorrhage†	23.4	31.3	1.2 (1.0-1.5)	25.9	0.9 (0.7-1.2)

\*The incidence is expressed as the number of cases per 1000 deliveries. Numbers in parentheses are 95% confidence intervals. RR represents relative risk compared with the spontaneous vaginal delivery group.  
 †Adjusted for parity.

Modified from Wen, et al Adjusted odds ratios and 95% confidence intervals for the effects of instruments (vacuum or forceps) on major adverse maternal outcomes obtained from multiple logistic regression analysis. (Quebec, Canada, 1991/1992–1995/1996)

Adverse outcomes	Vacuum vs. unassisted		Forceps vs. unassisted	
	OR*	95% CI*	OR	95% CI
Third-/fourth-degree perineal laceration	3.9	3.8, 4.1	8.4	8.0, 8.7

OR, odds ratio; CI, confidence interval

**Sources:** 36, 37, 40