

Table 1. Accuracy of American Hospital Association variables for neonatal level of care by hospital-year

AHA variable	Empiric Neonatal Level of Care					P-value	Unweighted kappa excluding missingness	Unweighted kappa including missingness
	0 n=52	I n=1040	II n=514	III n=728	IV n=98			
Total births						<0.001	-	-
Mean (SD)	51(130)	398 (281)	868 (440)	2454 (1503)	2316 (2405)			
Median (IQR)	0 (0,15)	326 (196, 529)	794 (530, 1105)	2086 (1326, 3354)	1861 (0,3775)			
Missing	3	4	10	31	0			
Total births, categorical						-	0.43 (0.41, 0.46)	0.42 (0.40, 0.45)
0-9	15	7	1	3	28			
10-499	4	724	106	20	9			
500-1499	1	305	348	173	0			
1500-2999	0	0	49	286	34			
≥3000	0	0	0	215	27			
Obstetric beds						<0.001	-	-
Mean (SD)	0 (0)	10 (6)	16 (7)	36 (18)	32 (36)			
Median (IQR)	0 (0,0)	9 (5,13)	15 (12,22)	33 (20,44)	25 (0,48)			
Missing	8	87	38	62	1			
Obstetric beds, categorical						-	0.34 (0.31, 0.37)	0.30 (0.28, 0.33)
0	14	21	4	0	27			
1-14	1	741	218	23	15			
15-24	0	171	183	185	4			
25-39	0	20	71	216	19			
≥40	0	0	0	242	32			
Obstetric care level, n						<0.001	-	-
1	1	631	225	52	0			
2	0	217	222	265	0			
3	0	84	24	349	70			
Missing	22	108	43	62	28			
Obstetric care level consolidated ¹ , n						-	0.38 (0.35, 0.41)	0.34 (0.31, 0.36)
1	NA	631	225	52				
2	NA	217	222	265				
3	NA	84	24	419				
Neonatal intermediate care beds						<0.001	-	-
Mean (SD)	0 (0)	0.2 (1.0)	1.3 (2.5)	1.9 (4.3)	6.3 (11.9)			
Median (IQR)	0 (0,0)	0 (0,0)	0 (0,2)	0 (0,0)	0 (0,10)			
Missing	8	87	38	62	1			
Neonatal intermediate care beds, categorical ² , n						-	0.13 (0.11, 0.16)	0.11 (0.09, 0.13)
0	912		356	524	68			
1-3	35		55	16	0			
4-7	20		34	63	2			

≥8	1		31	63	27	<0.001	-	-
Neonatal intensive care beds								
Mean (SD)	0 (0)	0 (0)	0 (1)	19 (16)	47 (19)			
Median (IQR)	0 (0,0)	0 (0,0)	0 (0,0)	15 (6,30)	40 (32, 52)			
Missing	8	87	38	62	1	-	0.71 (0.68, 0.74)	0.60 (0.57, 0.63)
Neonatal intensive care beds, categorical ³								
0	1417			101	0			
1-29	27			387	6			
≥30	0			6	91	-	0.84 (0.82, 0.86)	-
Random forest predicted maternal LOC ⁴ , n								
0	11	7	1	1	1			
1	7	972	97	14	0			
2	1	47	387	24	0			
3	4	14	29	683	7			
4	0	0	0	6	90			

Abbreviations: AHA – American Hospital Association, SD – standard deviation, IQR – interquartile range

¹The AHA annual survey data includes 3 levels of obstetric care. AHA level 3 care reflects level III and IV care, as described by the American College of Obstetricians/Gynecologists/Society for Maternal Fetal Medicine. The empiric levels were consolidated for kappa testing.

²If maternal and neonatal LOC aligns, hospitals with level 0 or I maternal care will not have neonatal intermediate care beds.

³If maternal and neonatal LOC aligns, hospitals with level 0, I, or II maternal care will not have neonatal intensive care beds.

⁴The random forest package used in R, imputed missing values for the predicted model.