

Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: Carlo WA, Goudar SS, Jehan I, et al. Newborn-care training and perinatal mortality in developing countries. *N Engl J Med* 2010;362:614-23.

Appendix Table 1: 7-Day Neonatal Mortality Rates According to Characteristics of the Infant or Delivery*

	Pre-ENC n (Rate/1000)	Post-ENC n (Rate/1000)	RR (95% CI) Post- vs. Pre-ENC	Post-NRP Intervention n (Rate/1000)	Post-NRP Control n (Rate/1000)	RR (95% CI) Post-NRP Intervention vs. Control
7-day neonatal mortality	513 (23.4)	793 (23.2)	0.99 (0.81, 1.22)	543 (18.6)	685 (21.4)	0.87 (0.65, 1.16)
Male	287 (25.0)	469 (26.4)	1.05 (0.84, 1.32)	297 (20.2)	401 (23.5)	0.86 (0.64, 1.15)
Female	225 (21.5)	323 (19.8)	0.92 (0.74, 1.14)	246 (17.5)	282 (18.8)	0.93 (0.67, 1.29)
Birth attendant						
All birth attendants	391 (21.3)	531 (19.7)	0.93 (0.74, 1.16)	429 (19.0)	547 (20.5)	0.93 (0.67, 1.29)
Physician	75 (19.2)	81 (16.1)	0.84 (0.52, 1.34)	24 (13.2)	83 (20.7)	0.64 (0.35, 1.16)
Nurse/midwife	176 (24.8)	158 (19.0)	0.77 (0.56, 1.04)	246 (24.2)	177 (18.5)	1.31 (0.85, 2.03)
Traditional birth attendants	140 (19.1)	292 (21.6)	1.13 (0.86, 1.49)	159 (15.0)	287 (21.9)	0.68 (0.45, 1.03)
Family/unattended/other	122 (34.0)	261 (36.1)	1.06 (0.74, 1.52)	113 (17.2)	138 (25.7)	0.67 (0.45, 1.00)
Location of birth						
Home/birth attendant home	374 (25.8)	581 (25.8)	1.00 (0.82, 1.22)	402 (20.3)	498 (23.0)	0.88 (0.64, 1.21)
Clinic	39 (23.3)	100 (27.6)	1.18 (0.80, 1.75)	73 (14.1)	82 (15.1)	0.94 (0.55, 1.61)
Hospital	100 (17.3)	111 (13.9)	0.80 (0.51, 1.27)	67 (15.9)	105 (21.1)	0.76 (0.35, 1.01)

Birth weight	
1500-1999 grams	80 (198.0) 138 (194.1) 0.98 (0.67, 1.44) 103 (113.9) 115 (190.7) 0.60 (0.35, 1.01)
2000-2499 grams	128 (59.7) 191 (53.7) 0.90 (0.63, 1.28) 162 (43.4) 191 (47.4) 0.92 (0.65, 1.28)
≥ 2500 grams	194 (12.0) 366 (12.7) 1.06 (0.77, 1.45) 236 (9.9) 310 (11.4) 0.87 (0.60, 1.25)

ENC=Essential Newborn Care; NRP=Neonatal Resuscitation Program

*May reflect missing value; birth weight available for 87.4% of infants with 7-day mortality

Appendix Table 2: Stillbirth Rates According to Characteristics of the Infant or Delivery*

	Pre-ENC n (Rate/1000)	Post-ENC n (Rate/1000)	RR (95% CI) Post- vs. Pre-ENC	Post-NRP Intervention n (Rate/1000)	Post-NRP Control n (Rate/1000)	RR (95% CI) Post-NRP Intervention vs. Control
Stillbirth	520 (23.0)	557 (15.9)	0.69 (0.54, 0.88)	468 (15.7)	491 (15.0)	1.05 (0.82, 1.33)
Fresh stillbirth	440 (19.4)	445 (12.7)	0.65 (0.49, 0.87)	336 (11.3)	347 (10.6)	1.06 (0.82, 1.37)
Macerated stillbirth	80 (3.5)	112 (3.2)	0.90 (0.55, 1.50)	132 (4.4)	144 (4.4)	1.01 (0.65, 1.57)
Male	279 (23.7)	317 (17.4)	0.73 (0.57, 0.94)	252 (16.8)	274 (15.8)	1.07 (0.80, 1.42)
Female	240 (22.2)	237 (14.2)	0.64 (0.47, 0.86)	213 (14.9)	216 (14.2)	1.05 (0.80, 1.37)
Birth attendant						
All birth attendants	411 (21.7)	376 (13.6)	0.63 (0.49, 0.81)	359 (15.6)	419 (15.4)	1.01 (0.79, 1.30)
Physician	62 (15.3)	89 (16.8)	1.10 (0.57, 2.11)	37 (19.8)	65 (15.9)	1.25 (0.80, 1.95)
Nurse/midwife	203 (27.7)	119 (13.9)	0.50 (0.35, 0.72)	175 (16.9)	165 (16.9)	1.00 (0.67, 1.48)
Traditional birth attendants	146 (19.4)	168 (12.2)	0.63 (0.45, 0.88)	147 (13.6)	189 (14.2)	0.96 (0.71, 1.30)
Family/unattended/other	109 (29.3)	181 (24.4)	0.83 (0.57, 1.22)	109 (16.2)	72 (13.2)	1.23 (0.76, 2.01)
Location of birth						

Home/birth attendant home	392 (26.3)	376 (16.4)	0.63 (0.49, 0.80)	326 (16.2)	326 (14.8)	1.09 (0.86, 1.39)
Clinic	32 (18.7)	67 (18.1)	0.97 (0.55, 1.70)	65 (12.4)	93 (16.7)	0.74 (0.41, 1.33)
Hospital	96 (16.1)	114 (13.6)	0.85 (0.49, 1.45)	77 (17.9)	72 (14.2)	1.26 (0.66, 2.39)
Birth weight (grams)*						
1500-1999 grams	49 (106.3)	89 (110.1)	1.04 (0.63, 1.71)	63 (65.1)	45 (69.3)	0.94 (0.46, 1.90)
2000-2499 grams	67 (30.2)	107 (29.1)	0.96 (0.62, 1.50)	76 (19.9)	75 (18.3)	1.09 (0.59, 2.03)
≥ 2500 grams	149 (9.1)	172 (5.9)	0.65 (0.43, 0.97) †	162 (6.7)	144 (5.3)	1.28 (0.82, 2.00)

ENC=Essential Newborn Care; NRP=Neonatal Resuscitation Program

*May reflect missing values; birth weight available for 58.9% of stillbirths

Appendix Table 3: Perinatal Mortality Rates According to Characteristics of the Infant or Delivery *

	Pre-ENC n (Rate/1000)	Post-ENC n (Rate/1000)	RR (95% CI) Post- vs. Pre-ENC	Post-NRP Intervention n (Rate/1000)	Post-NRP Control n (Rate/1000)	RR (95% CI) Intervention vs. Control
Perinatal mortality	1,033 (45.9)	1,350 (38.9)	0.85 (0.70, 1.02)	1,011 (34.1)	1,176 (36.1)	0.94 (0.76, 1.17)
Male	566 (48.2)	786 (43.4)	0.90 (0.74, 1.09)	549 (36.7)	675 (38.9)	0.94 (0.76, 1.17)
Female	465 (43.4)	560 (33.8)	0.78 (0.63, 0.96)	459 (32.1)	498 (32.8)	0.98 (0.77, 1.24)
Birth attendant						
All birth attendants	802 (42.7)	907 (33.3)	0.78 (0.64, 0.94)	788 (34.4)	966 (35.6)	0.96 (0.77, 1.21)
Physician	137 (34.3)	170 (33.1)	0.97 (0.62, 1.50)	61 (32.8)	148 (36.3)	0.90 (0.62, 1.33)
Nurse/midwife	379 (51.9)	277 (32.8)	0.63 (0.48, 0.83)	421 (40.8)	342 (35.1)	1.16 (0.82, 1.65)
Traditional birth attendants	286 (38.2)	460 (33.6)	0.88 (0.71, 1.10)	306 (28.5)	476 (35.8)	0.79 (0.61, 1.03)
Family/unattended/other	231 (62.6)	442 (59.6)	0.95 (0.72, 1.26)	222 (33.2)	210 (38.6)	0.86 (0.62, 1.19)
Location of birth						
Home/birth attendant home	766 (51.5)	957 (41.8)	0.81 (0.68, 0.97)	728 (36.2)	824 (37.5)	0.97 (0.77, 1.21)
Clinic	71 (41.7)	167 (45.2)	1.08 (0.73, 1.60)	138 (26.4)	175 (31.6)	0.83 (0.52, 1.34)

Hospital	196 (33.2)	225 (27.7)	0.83 (0.55, 1.26)	144 (33.6)	177 (35.0)	0.96 (0.56, 1.64)
Birth weight*						
1500-1999 grams	129 (283.8)	227 (283.8)	1.00 (0.74, 1.35)	166 (171.7)	160 (246.9)	0.70 (0.45, 1.08)
2000-2499 grams	195 (88.2)	298 (81.3)	0.92 (0.69, 1.24)	238 (62.5)	266 (64.9)	0.96 (0.72, 1.30)
≥ 2500 grams	343 (21.0)	538 (18.5)	0.88 (0.67, 1.17)	398 (16.5)	454 (16.6)	1.00 (0.76, 1.31)

ENC=Essential Newborn Care; NRP=Neonatal Resuscitation Program

*May reflect missing values; birth weight available for 74.7% of infants with perinatal mortality

Appendix Table 4: Mortality within 24 Hours of Birth*

	Pre-ENC	Post-ENC	RR (95% CI)	Post-NRP Intervention	Post-NRP Control	RR (95% CI)
	n (Rate/1000)	n (Rate/1000)	Post- vs. Pre-ENC	n (Rate/1000)	n (Rate/1000)	
24 hour neonatal mortality	196 (8.9)	340 (9.9)	1.11 (0.74, 1.68)	152 (5.2)	203 (6.3)	0.82 (0.52, 1.30)
Male	100 (8.7)	194 (10.8)	1.24 (0.78, 1.99)	92 (6.2)	123 (7.2)	0.87 (0.52, 1.45)
Female	95 (9.0)	145 (8.8)	0.98 (0.65, 1.47)	60 (4.3)	78 (5.2)	0.82 (0.52, 1.28)
Birth attendant						
All birth attendants	156 (8.4)	276 (10.2)	1.20 (0.77, 1.88)	123 (5.4)	158 (5.9)	0.92 (0.57, 1.50)
Physician	23 (5.8)	32 (6.1)	1.07 (0.56, 2.04)	7 (3.8)	24 (6.0)	0.64 (0.13, 3.15)
Nurse/midwife	55 (7.7)	90 (10.7)	1.39 (0.71, 2.69)	58 (5.7)	38 (4.0)	1.44 (0.52, 3.95)
Traditional birth attendants	78 (10.6)	154 (11.4)	1.07 (0.69, 1.68)	58 (5.5)	96 (7.3)	0.75 (0.44, 1.27)
Family/unattended/other	40 (11.1)	63 (8.7)	0.78 (0.29, 2.11)	28 (4.2)	45 (8.3)	0.51 (0.23, 1.11)
Location of birth						
Home/birth attendant home	133 (9.1)	217 (9.6)	1.05 (0.68, 1.64)	79 (4.0)	144 (6.6)	0.60 (0.36, 1.01)
Clinic	24 (14.3)	78 (21.4)	1.50 (0.83, 2.73)	43 (8.3)	38 (7.0)	1.19 (0.52, 2.71)

Hospital	39 (6.6)	44 (5.3)	0.80 (0.44, 1.46)	29 (6.9)	21 (4.2)	1.63 (0.53, 5.05)
Birth weight						
1500-1999 grams	34 (82.5)	64 (89.0)	1.08 (0.53, 2.19)	27 (29.8)	27 (44.7)	0.67 (0.22, 2.04)
2000-2199 grams	41 (19.1)	68 (19.0)	1.00 (0.54, 1.83)	32 (8.6)	34 (8.4)	1.02 (0.46, 2.25)
≥ 2500 grams	81 (5.0)	171 (5.9)	1.18 (0.66, 2.11)	67 (2.8)	81 (3.0)	0.94 (0.47, 1.87)

ENC=Essential Newborn Care; NRP=Neonatal Resuscitation Program

*May reflect missing values