

Kozuki N, et al. The associations of birth intervals with small-for-gestational-age, preterm, and neonatal and infant mortality: a meta-analysis.

Supplemental Table 1: Adjustment variables used in the adjusted logistic regression analyses, by study

Country	Socioeconomic adjustment variables	Maternal nutrition adjustment variables	Reproductive health variables
Brazil (1982)[11]	Income, maternal education	Height, BMI	Maternal age, parity
Brazil (1993)[12]	Income, maternal education	Height, BMI	Maternal age, parity
Brazil (2004)[13]	Income, maternal education	Height, BMI	Maternal age, parity
Philippines (1983)[15]	Land ownership, literacy, housing structure	Height, BMI, MUAC	Maternal age, parity
Zimbabwe (1997)[14]	Income quintiles	Postpartum MUAC	Maternal age, parity

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Supplemental Table 2a: Unadjusted and adjusted associations between birth intervals and adverse newborn outcomes, by study

Study name	Birth interval	SGA (Reference: AGA)						Preterm (Reference: Term)					
		Unadjusted			Adjusted			Unadjusted			Adjusted		
		OR	LI	UI	OR	LI	UI	OR	LI	UI	OR	LI	UI
Brazil (1982)[11]	<18	2.0	1.6	2.6	1.9	1.4	2.5	1.2	0.8	1.9	1.3	0.8	2.0
	18-<24	1.7	1.2	2.3	1.6	1.1	2.3	1.1	0.6	1.9	1.0	0.5	1.8
	24-<36	1.4	1.0	1.8	1.3	0.9	1.8	1.0	0.6	1.6	0.9	0.5	1.6
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.3	1.0	1.7	1.5	1.1	2.0	1.0	0.6	1.6	0.9	0.5	1.6
Brazil (1993)[12]	<18	1.5	1.1	2.1	1.4	1.0	2.1	2.0	1.3	3.0	1.9	1.2	3.0
	18-<24	1.4	1.0	2.0	1.5	1.0	2.1	0.9	0.6	1.6	1.0	0.6	1.7
	24-<36	1.3	1.0	1.8	1.3	0.9	1.7	1.4	1.0	2.1	1.3	0.9	1.9
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.1	0.9	1.4	1.3	1.0	1.6	1.3	0.9	1.7	1.3	0.9	1.7
Brazil (2004)[13]	<18	1.6	1.1	2.5	1.2	0.6	2.3	2.3	1.5	3.5	2.1	1.2	3.6
	18-<24	1.0	0.6	1.7	0.8	0.4	1.7	1.6	1.1	2.5	1.5	0.8	2.7
	24-<36	1.0	0.7	1.5	0.9	0.5	1.6	1.0	0.7	1.5	1.0	0.6	1.7
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.1	0.9	1.5	1.4	0.9	2.0	0.7	0.5	1.0	0.8	0.6	1.2
Philippines (1983)[15]	<18	1.28	0.92	1.78	1.31	0.93	1.83	0.92	1.78	1.31	0.93	1.83	1.05
	18-<24	1.07	0.79	1.46	1.13	0.82	1.56	0.79	1.46	1.13	0.82	1.56	0.75
	24-<36	0.76	0.57	1.01	0.76	0.57	1.02	0.57	1.01	0.76	0.57	1.02	0.59
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	0.84	0.58	1.23	0.94	0.64	1.40	0.58	1.23	0.94	0.64	1.4	0.61
Zimbabwe (1997)[14]	<18	1.47	1.15	1.88	1.48	1.15	1.90	1.15	1.88	1.48	1.15	1.9	1.35
	18-<24	1.17	0.94	1.46	1.11	0.89	1.38	0.94	1.46	1.11	0.89	1.38	1.37
	24-<36	1.08	0.94	1.24	1.06	0.93	1.21	0.94	1.24	1.06	0.93	1.21	1.13
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.12	0.99	1.26	1.13	1.00	1.28	0.99	1.26	1.13	1.00	1.28	1.02

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SGA = small-for-gestational-age, defined as below the 10th percentile of the U.S. 1991 reference distribution described by Alexander and colleagues [19]. AGA = appropriate-for-gestational-age. Preterm = below 37 completed weeks of gestation

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Supplemental Table 2b: Unadjusted and adjusted associations between birth intervals and adverse newborn outcomes, by study

		Term-SGA (Reference: Term-AGA)						Preterm-AGA (Reference: Term-AGA)						Preterm-SGA (Reference: Term-AGA)					
Study name	Birth interval	Unadjusted			Adjusted			Unadjusted			Adjusted			Unadjusted			Adjusted		
		OR	LI	UI	OR	LI	UI	OR	LI	UI	OR	LI	UI	OR	LI	UI	OR	LI	UI
Brazil (1982) [11]	<18	1.6	1.2	2.2	1.6	1.1	2.3	1.1	0.7	1.7	1.1	0.7	1.9	3.5	1.2	10.8	3.7	1.0	13.4
	18-<24	1.4	0.9	2.1	1.4	0.9	2.1	0.8	0.4	1.6	0.7	0.5	1.5	4.0	1.2	13.8	3.6	0.8	15.7
	24-<36	1.2	0.8	1.7	1.3	0.8	1.8	1.0	0.6	1.6	0.9	0.5	1.6	1.4	0.3	5.7	1.4	0.3	6.3
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	0.9	0.6	1.2	1.0	0.7	1.6	0.8	0.5	1.4	0.8	0.6	1.5	1.9	0.6	6.6	2.2	0.5	8.5
Brazil (1993) [12]	<18	1.6	1.1	2.3	1.6	1.1	2.5	2.2	1.4	3.3	2.1	1.3	3.4	1.2	0.1	11.3	1.6	0.1	19.0
	18-<24	1.4	0.9	2.0	1.4	0.9	2.1	0.9	0.5	1.5	1.0	0.6	1.7	3.1	0.6	15.7	3.5	0.6	22.5
	24-<36	1.3	0.9	1.8	1.3	0.9	1.8	1.5	1.0	2.2	1.3	0.9	2.0	1.7	0.3	8.6	1.6	0.2	11.7
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.2	0.9	1.5	1.3	1.0	1.7	1.3	0.9	1.8	1.2	0.9	1.7	1.9	0.5	7.1	3.6	0.7	17.5
Brazil (2004) [13]	<18	1.5	0.9	2.7	1.0	0.5	2.4	2.6	1.7	4.0	2.1	1.2	3.7	3.7	0.5	8.1	1.9	0.3	10.5
	18-<24	1.0	0.5	1.8	0.7	0.3	1.7	1.8	1.1	2.8	1.6	0.9	2.8	1.1	0.1	4.8	0.6	0.1	5.7
	24-<36	0.9	0.5	1.4	0.7	0.4	1.3	1.0	0.7	1.5	1.1	0.6	1.8	1.7	0.3	3.3	0.7	0.1	3.5
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.0	0.7	1.4	1.2	1.0	1.8	0.7	0.5	1.0	0.8	0.6	1.4	1.8	0.4	2.5	0.9	0.3	3.1
Philippines (1983) [15]	<18	1.19	0.84	1.68	1.26	0.88	1.80	0.89	0.58	1.38	0.98	0.63	1.19	1.26	0.84	1.68	0.89	0.88	1.80
	18-<24	1.03	0.74	1.43	1.12	0.80	1.57	1.00	0.68	1.47	1.03	0.73	1.08	1.12	0.74	1.43	1.00	0.80	1.57
	24-<36	0.75	0.56	1.02	0.76	0.56	1.03	1.02	0.73	1.43	0.75	0.75	1.06	0.76	0.56	1.02	1.02	0.56	1.03
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	0.82	0.55	1.23	0.92	0.61	1.40	0.87	0.55	1.39	0.82	0.55	0.88	0.92	0.55	1.23	0.87	0.61	1.40
Zimbabwe (1997) [14]	<18	1.31	1.00	1.72	1.31	1.00	1.72	1.47	0.87	2.50	1.31	0.80	1.39	1.31	1.00	1.72	1.47	1.00	1.72
	18-<24	1.15	0.92	1.46	1.09	0.86	1.37	1.21	0.76	1.94	1.13	0.70	1.15	1.09	0.92	1.46	1.21	0.86	1.37
	24-<36	1.08	0.94	1.24	1.06	0.92	1.22	0.85	0.62	1.17	0.84	0.61	1.08	1.06	0.94	1.24	0.92	0.85	1.22

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	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.14	1.01	1.29	1.15	1.02	1.31	1.25	0.97	1.60	1.27	0.98	1.14	1.15	1.01	1.29	1.25	1.02	1.31

SGA = small-for-gestational-age, defined as below the 10th percentile of the U.S. 1991 reference distribution described by Alexander and colleagues [19]. AGA = appropriate-for-gestational-age. Preterm = below 37 completed weeks of gestation

Supplemental Table 2c: Unadjusted and adjusted associations between birth intervals and risk of neonatal and infant mortality, by study

Study name	birth interval	Neonatal Mortality						Infant mortality					
		unadj			adj			unadj			adj		
		OR	LI	UI	OR	LI	UI	OR	LI	UI	OR	LI	UI
Brazil (1982) [11]	<18	1.5	0.8	2.9	1.2	0.6	2.6	3.0	1.7	5.3	1.7	0.9	3.2
	18-<24	1.4	0.6	3.4	1.3	0.5	3.4	2.1	1.1	4.3	2.0	0.9	4.2
	24-<36	1.3	0.6	2.9	1.0	0.4	2.5	2.1	1.1	4.1	1.7	0.8	3.4
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.2	0.6	2.5	0.9	0.4	2.1	1.5	0.8	2.8	1.0	0.5	2.1
Brazil (1993) [12]	<18	2.6	1.1	6.1	1.9	0.8	4.8	1.9	0.9	3.9	1.5	0.7	3.2
	18-<24	0.5	0.1	2.3	0.5	0.1	2.1	0.8	0.3	2.1	0.5	0.2	1.6
	24-<36	1.0	0.4	2.5	0.8	0.3	2.1	1.2	0.6	2.4	1.0	0.5	2.2
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.1	0.5	2.4	1.0	0.4	2.1	0.9	0.5	1.6	0.8	0.4	1.5
Brazil (2004) [13]	<18	1.0	0.2	5.2	0.6	0.1	5.3	0.6	0.1	2.9	0.3	0.1	2.7
	18-<24	1.1	0.2	5.5	small n			1.3	0.4	4.3	0.3	0.1	2.7
	24-<36	1.1	0.3	3.9	0.9	0.2	4.7	1.5	0.6	3.7	0.6	0.2	2.5
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	1.1	0.4	2.9	1.2	0.3	4.3	1.2	0.5	2.5	1.1	0.4	3.1
Philippines (1983) [15]	<18	3.13	0.78	12.59	3.50*	0.86	14.33	2.07	0.99	4.32	2.65	0.78	3.13
	18-<24	2.58	0.66	10.05	2.79*	0.71	10.95	1.49	0.72	3.11	1.59	0.66	2.58
	24-<36	1.53	0.39	5.95	1.49*	0.38	5.82	1.02	0.50	2.06	1.12	0.39	1.53
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	2.05	0.41	10.21	1.96*	0.38	5.82	0.74	0.26	2.10	0.79	0.41	2.05
Zimbabwe (1997) [14]	<18	1.22	0.37	4.07	1.26	0.38	4.20	2.34	1.65	3.34	1.22	0.37	2.43
	18-<24	0.55	0.13	2.34	0.54	0.13	2.29	1.12	0.77	1.62	0.55	0.13	1.10
	24-<36	0.91	0.45	1.81	0.91	0.45	1.81	1.15	0.92	1.45	0.91	0.45	1.17
	36-<60	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
	≥60	0.82	0.44	1.53	0.90	0.48	1.68	0.98	0.79	1.20	0.82	0.44	1.04

*Height removed from this set of analyses due to convergence issues.