

Supplementary Materials

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Table S1: Risk of bias of post-only with concurrent control studies assessed with Methodological Index for Non-randomized Studies (MINORS).

First Author	Year	Clearly stated aim	Consecutive inclusion	Prospective collection of data	Appropriate endpoints	Unbiased assessment of study endpoint	Appropriate follow-up period	Loss to follow up <5%	Calculation of study size	Control group with gold standard	Contemporary groups	Baseline equivalence of groups	Adapted statistical analyses	SUM	Overall quality ^a
Shuai Li	2017	7	6	7	7	3	5	6	2	4	7	7	5	66	High
Qin Hu	2016	7	3	7	5	3	5	4	2	3	7	7	4	57	High
Xiaoting Ding	2016	7	3	6	6	3	4	5	2	4	7	4	7	58	High
Yanfeng Zhang	2016	7	5	6	6	4	6	3	3	4	7	4	4	59	High
Lingyun Ren	2014	7	2	6	5	2	5	5	2	2	7	3	4	50	Medium
Shangming Li	2014	7	2	6	4	2	4	4	2	4	7	3	3	48	Low
Songli Fan	2013	7	4	7	5	3	2	3	2	3	7	3	3	49	Low
Wenhao Li	2013	7	6	7	7	3	2	6	2	4	7	7	6	64	High
Wenli Zhao	2012	6	3	6	5	3	4	3	3	4	7	4	5	53	Medium
Zhifeng Fang	2010	6	2	6	5	3	3	3	2	3	7	4	4	48	Low
Yuying Wang	2009	7	3	7	5	3	4	3	2	2	7	4	5	52	Medium
Yuying Wang	2004	7	3	7	5	2	4	4	2	2	7	4	4	51	Medium
Shuhua Ni	1995	7	2	7	5	2	3	3	1	4	7	3	4	48	Low

The overall quality is based on total MINORS score. In post-only studies, we defined a paper with a score higher than 53 a high-quality one, 50-53 a moderate-quality one, and lower than 50 a low-quality one.

Table S2: Risk of bias of pre-post studies assessed with Methodological Index for Non-randomized Studies (MINORS).

First Author	Year	Clearly stated aim	Consecutive inclusion	Prospective collection of data	Appropriate endpoints	Unbiased assessment of study endpoint	Appropriate follow-up period	Loss to follow up <5%	Prospective calculation of study size	SUM	Overall quality ^a
Jie Wang	2017	7	4	7	5	3	5	3	4	38	High
Ping Wu	2017	5	3	5	4	2	4	4	1	28	Low
Qiuqing Jiang	2016	7	5	6	4	3	4	4	2	35	Medium
Junsheng Huo	2015	7	5	7	6	4	6	5	4	44	High
Qiannan Zhang	2015	7	4	7	6	3	4	5	7	43	High
Jianhong Qin	2014	6	3	7	3	2	4	4	2	31	Medium
Zuyang Liu	2013	6	3	6	5	2	5	4	2	33	Medium
Zengkang Xu	2012	7	5	7	5	4	6	4	3	41	High
Caixia Dong	2012	7	4	7	6	3	3	4	4	38	High
Lixiang Li	2012	5	3	6	4	3	2	3	2	28	Low
Lijuan Wang	2011	7	3	7	6	3	2	4	2	34	Medium
Jing Sun	2011	5	3	6	5	4	2	3	2	30	Low
Hong Shen	2011	4	2	5	3	2	2	2	1	21	Low

The overall quality is based on total MINORS score. In pre-post studies, papers with scores higher than 35 were of high quality, 31-35 were of moderate quality, and less than 31 were of low quality.

Table S3: Composition of three types of YYB.

	A (one sachet per day)	B (one sachet per day)	C (one sachet per 10 days)
Protein	3 g	3.8 g	17.1 g
Fat	1 g		10 g
Carbohydrates	6 g		63.1 g
Iron	7.5 mg	6.0 mg	6 mg
Zinc	5 mg	4.1 mg	
Calcium	200 mg	385 mg	523 mg
Vitamin A	250 µg		333 µg
Vitamin B1	0.5 mg		0.54 mg
Vitamin B2	0.5 mg	0.2 mg	0.87 mg
Vitamin B3			1.72 mg
Vitamin B12	0.5 µg		
Vitamin D	5 µg	7 µg	2 mg
Folic acid	75 µg		
Phosphorus			325 mg
Number of controlled studies	11	6	1
Number of pre-post studies	14	0	0

Table S4: Effects of YYB by intervention duration on hemoglobin concentration (g/L), height (cm), weight (kg) and Z-scores.

Post-only with concurrent control studies	Number of studies	Mean difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Hemoglobin concentration (g/L)				
>12 months	2	6.17 (-0.09, 12.42)	0.053	92
≤12 months	5	3.78 (-0.57, 8.12)	0.088	97
Height (cm)				
>12 months	2	1.10 (-0.77, 2.96)	0.249	77
≤12 months	4	3.16 (1.41, 4.90)	<0.001	93
Weight (kg)				
>12 months	2	0.64 (-0.09, 1.38)	0.085	88
≤12 months	4	0.85 (0.12, 1.59)	0.023	98
Height-for-age Z score (SD)				
>12 months	1	-0.57 (-0.97, -0.17)	0.006	\
≤12 months	2	0.22 (-0.50, 0.95)	0.548	96
Weight-for-height Z score (SD)				
>12 months	1	0.58 (0.24, 0.92)	0.001	\
≤12 months	2	0.19 (0.09, 0.30)	<0.001	22
Weight-for-age Z score (SD)				
>12 months	1	0.54 (0.20, 0.88)	0.002	\
≤12 months	2	0.07 (-0.26, 0.41)	0.669	91
Pre-post studies	Number of studies	Mean difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Hemoglobin concentration (g/L)				

>12 months	4	8.82 (2.02, 15.62)	0.011	99
≤12 months	3	3.59 (0.32, 6.86)	0.031	93
Height (cm)				
>12 months	2	3.27 (2.57, 3.97)	<0.001	0
≤12 months	3	2.01 (0.54, 3.49)	0.007	92
Weight (kg)				
>12 months	2	0.85 (0.35, 1.35)	0.001	87
≤12 months	3	0.63 (0.09, 1.17)	0.023	96
Height-for-age Z score (SD)				
>12 months	3	0.35 (0.24, 0.46)	<0.001	9
≤12 months	2	0.09 (-0.02, 0.20)	0.115	0
Weight-for-height Z score (SD)				
>12 months	2	0.31 (0.03, 0.58)	0.028	80
≤12 months	2	0.25 (-0.44, 0.93)	0.478	98
Weight-for-age Z score (SD)				
>12 months	3	0.23 (-0.21, 0.67)	0.304	95
≤12 months	2	0.29 (-0.32, 0.90)	0.352	98

Table S5: Effects of YYB by intervention duration on prevalence of anemia, stunting, underweight and wasting.

Post-only with concurrent control studies	Number of studies	Risk ratio (95%CI)	P-value for summary effects	I ² for heterogeneity (%)	Risk difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Anemia							
>12 months	3	0.45 (0.27, 0.75)	0.002	87	-0.22 (-0.35, -0.10)	<0.001	93
≤12 months	8	0.55 (0.41, 0.74)	<0.001	85	-0.10 (-0.16, -0.05)	<0.001	89
Underweight							
>12 months	1	0.68 (0.26, 1.83)	0.449	\	-0.04 (-0.13, 0.06)	0.444	\
≤12 months	5	0.50 (0.38, 0.65)	<0.001	34	-0.04 (-0.06, -0.03)	<0.001	0
Stunting							
>12 months	2	0.48 (0.38, 0.60)	<0.001	0	-0.08 (-0.10, -0.05)	<0.001	0
≤12 months	5	0.63 (0.44, 0.92)	0.016	70	-0.05 (-0.08, -0.02)	0.002	52
Wasting							
>12 months	1	0.77 (0.28, 2.11)	0.612	\	-0.02 (-0.11, 0.07)	0.609	\
≤12 months	4	0.44 (0.29, 0.67)	<0.001	29	-0.03 (-0.04, -0.01)	<0.001	63
Pre-post studies	Number of studies	Risk ratio (95%CI)	P-value for summary effects	I ² for heterogeneity (%)	Risk difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Anemia							
>12 months	8	0.53 (0.45, 0.64)	<0.001	84	-0.24 (-0.32, -0.15)	<0.001	94
≤12 months	5	0.70 (0.58, 0.85)	<0.001	81	-0.14 (-0.21, -0.06)	<0.001	82
Underweight							
>12 months	6	0.64 (0.39, 1.04)	0.071	70	-0.03 (-0.06, 0.00)	0.083	81

≤12 months	4	0.52 (0.30, 0.90)	0.019	61	-0.03 (-0.05, -0.01)	0.004	51
Stunting							
>12 months	6	0.72 (0.51, 1.03)	0.073	77	-0.04 (-0.08, 0.00)	0.069	78
≤12 months	4	0.81 (0.61, 1.07)	0.131	37	-0.02 (-0.05, 0.00)	0.088	38
Wasting							
>12 months	5	0.71 (0.51, 0.98)	0.035	0	-0.01 (-0.03, 0.00)	0.126	38
≤12 months	2	0.51 (0.05, 5.29)	0.569	89	-0.01 (-0.07, 0.05)	0.741	92

Table S6: Effects of YYB on hemoglobin concentration (g/L), height (cm), weight (kg) and Z-scores among studies of high and medium quality¹.

Post-only with concurrent control studies	Number of studies	Mean difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Hemoglobin concentration (g/L)	6	5.23 (2.14, 8.31)	0.001	97
Height (cm)	5	2.82 (0.89, 4.75)	0.004	95
Weight (kg)	5	0.85 (0.19, 1.51)	0.011	97
Height-for-age Z score (SD)	3	-0.03 (-0.68, 0.62)	0.938	95
Weight-for-height Z score (SD)	3	0.27 (0.09, 0.45)	0.003	66
Weight-for-age Z score (SD)	3	0.20 (-0.11, 0.51)	0.213	89
Pre-post studies	Number of studies	Mean difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Hemoglobin concentration (g/L)	6	6.44 (2.21, 10.67)	0.003	99
Height (cm)	4	2.26 (0.99, 3.52)	<0.001	90
Weight (kg)	4	0.59 (0.23, 0.96)	0.001	92
Height-for-age Z score (SD)	4	0.28 (0.11, 0.45)	0.001	73
Weight-for-height Z score (SD)	3	0.17 (-0.15, 0.49)	0.304	92
Weight-for-age Z score (SD)	4	0.17 (-0.15, 0.48)	0.301	94

¹ High and medium quality studies refers to post-only with concurrent control studies with total quality scores ≥ 50 , and pre-post studies with total quality scores ≥ 31 .

Table S7: Effects of YYB on prevalence of anemia, stunting, underweight and wasting among studies of high and medium quality¹.

Post-only with concurrent control studies	Number of studies	Risk ratio (95%CI)	P-value for summary effects	I ² for heterogeneity (%)	Risk difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Anemia	9	0.53 (0.44, 0.64)	<0.001	75	-0.15 (-0.23, -0.07)	<0.001	96
Underweight	4	0.42 (0.29, 0.59)	<0.001	0	-0.04 (-0.05, -0.02)	<0.001	0
Stunting	5	0.54 (0.38, 0.78)	0.001	76	-0.06 (-0.09, -0.03)	<0.001	62
Wasting	4	0.45 (0.30, 0.68)	<0.001	29	-0.03 (-0.05, -0.00)	0.026	57
Pre-post studies	Number of studies	Risk ratio (95%CI)	P-value for summary effects	I ² for heterogeneity (%)	Risk difference (95%CI)	P-value for summary effects	I ² for heterogeneity (%)
Anemia	9	0.61 (0.51, 0.73)	<0.001	91	-0.21 (-0.29, -0.13)	<0.001	95
Underweight	8	0.69 (0.51, 0.93)	0.017	50	-0.02 (-0.04, -0.00)	0.026	60
Stunting	8	0.79 (0.62, 1.01)	0.057	65	-0.03 (-0.05, -0.00)	0.041	64
Wasting	5	0.93 (0.70, 1.23)	0.599	40	-0.00 (-0.01, 0.01)	0.595	42

¹ High and medium quality studies refer to post-only with concurrent control studies with total quality scores ≥ 50 , and pre-post studies with total quality scores ≥ 31 .

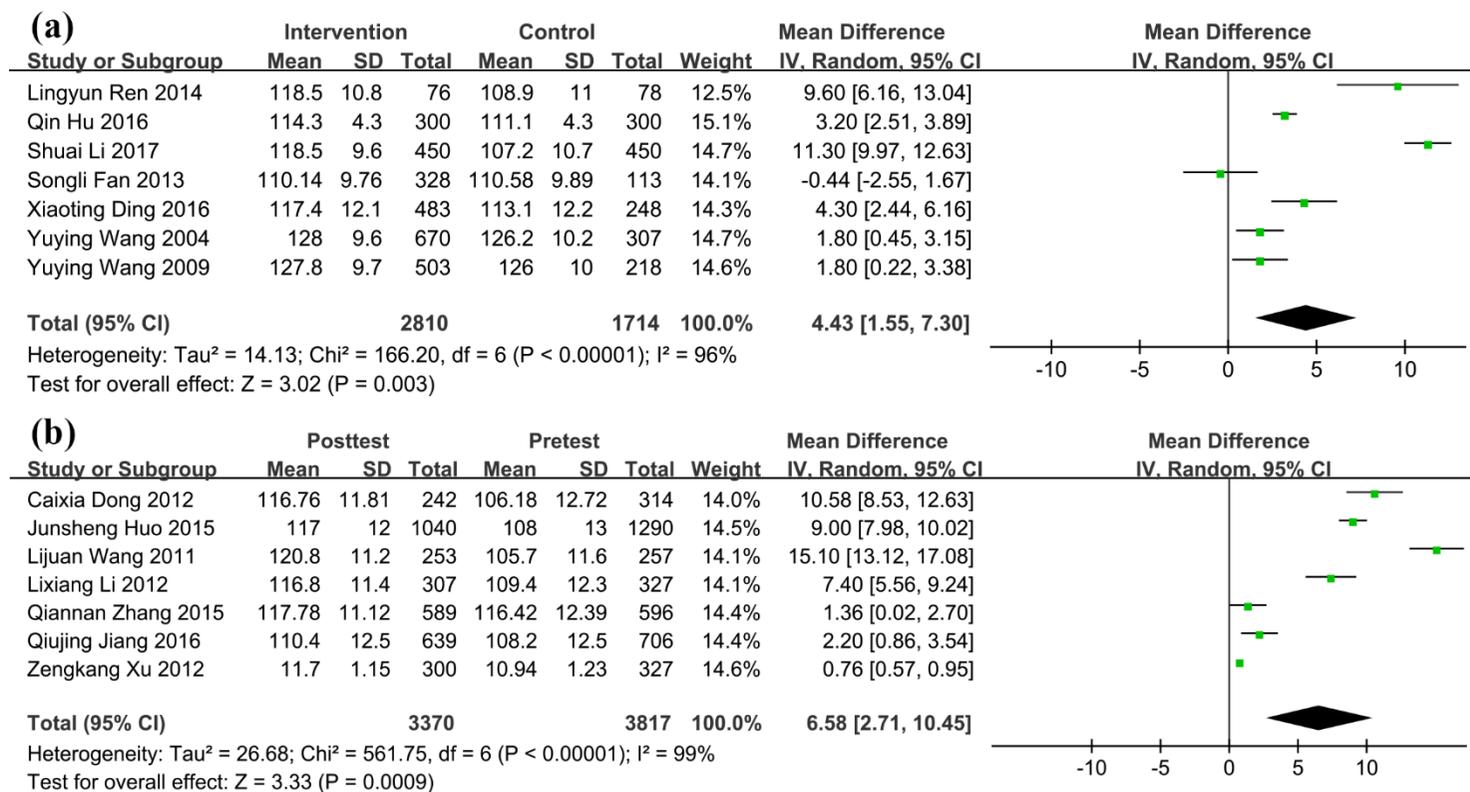


Figure S1: Effects of YYB on hemoglobin level (g/L) among post-only with concurrent control studies (a) and pre-post studies (b) using mean difference as the effect measure.

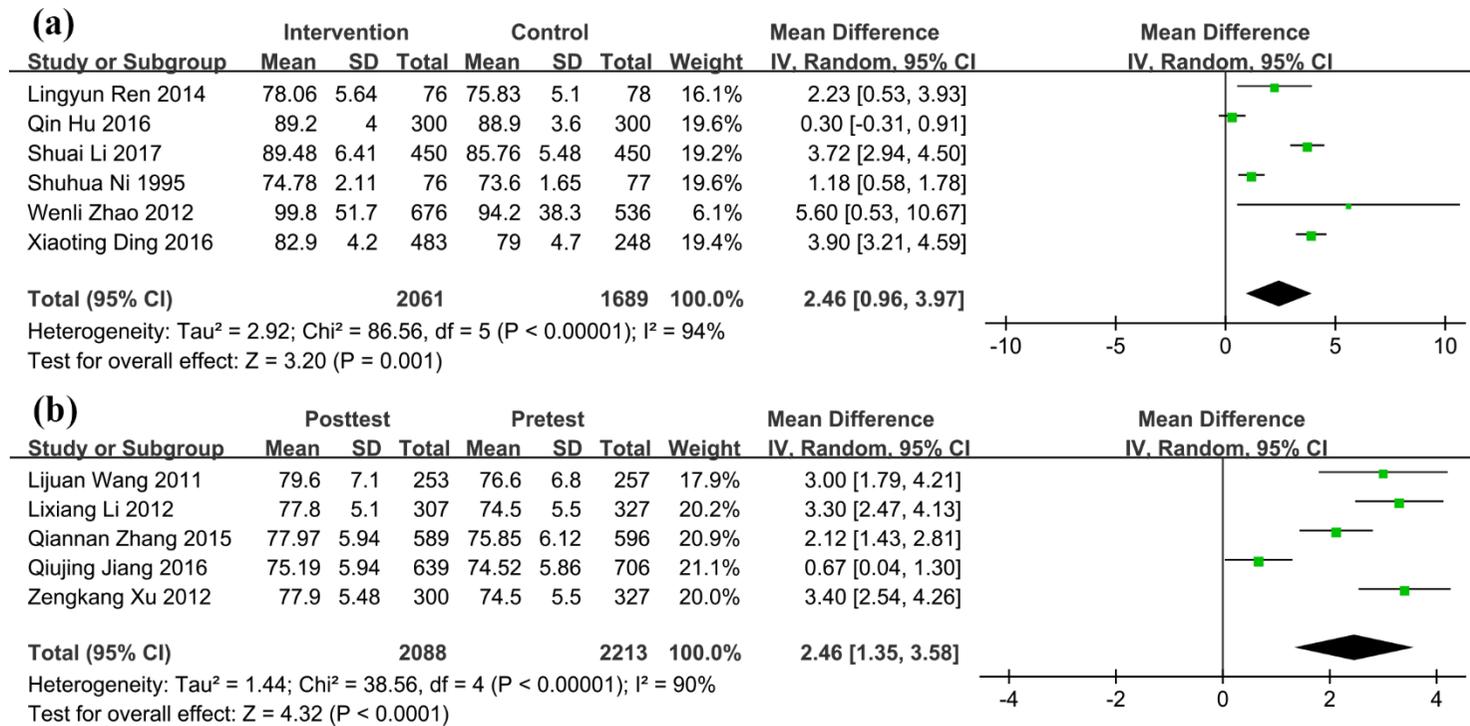


Figure S2: Effects of YYB on height (cm) among post-only with concurrent control studies (a) and pre-post studies (b) using mean difference as the effect measure.

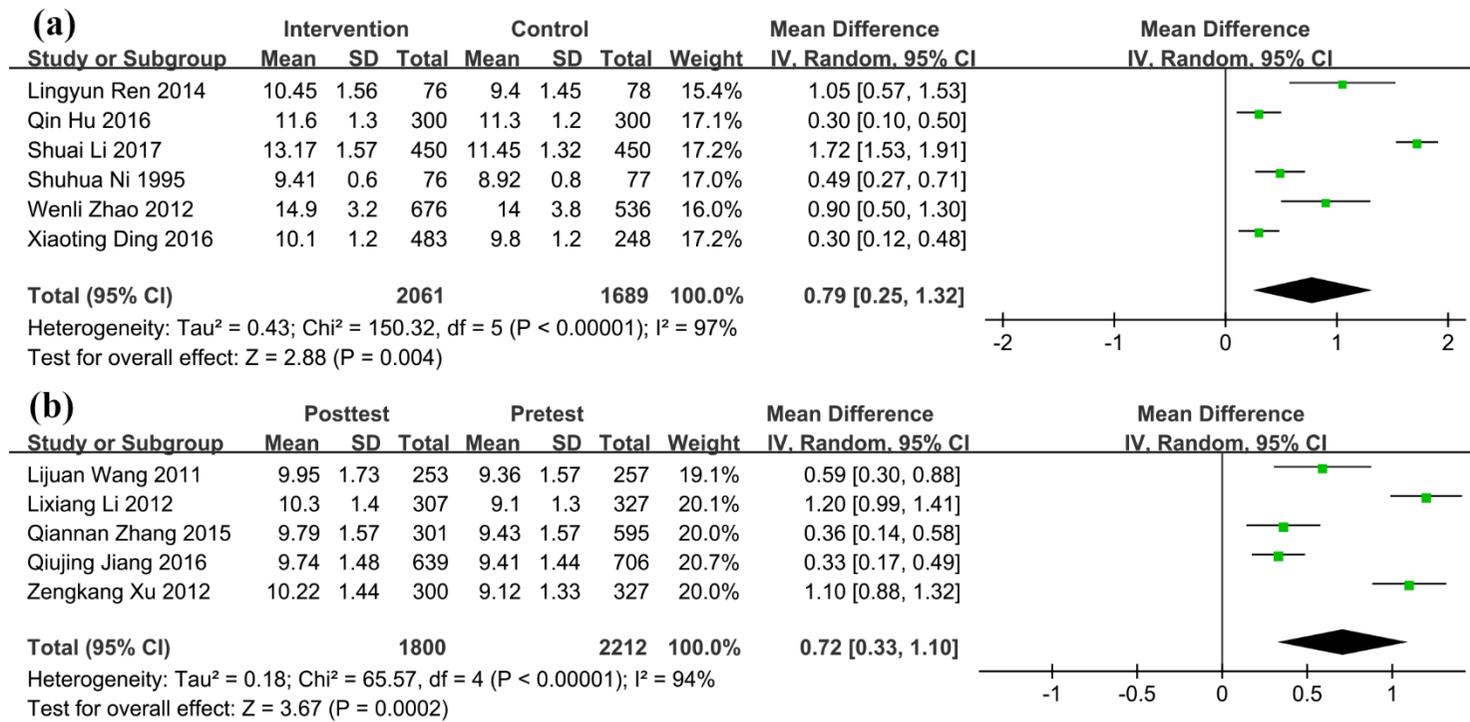


Figure S3: Effects of YYB on weight (kg) among post-only with concurrent control studies (a) and pre-post studies (b) using mean difference as the effect measure.

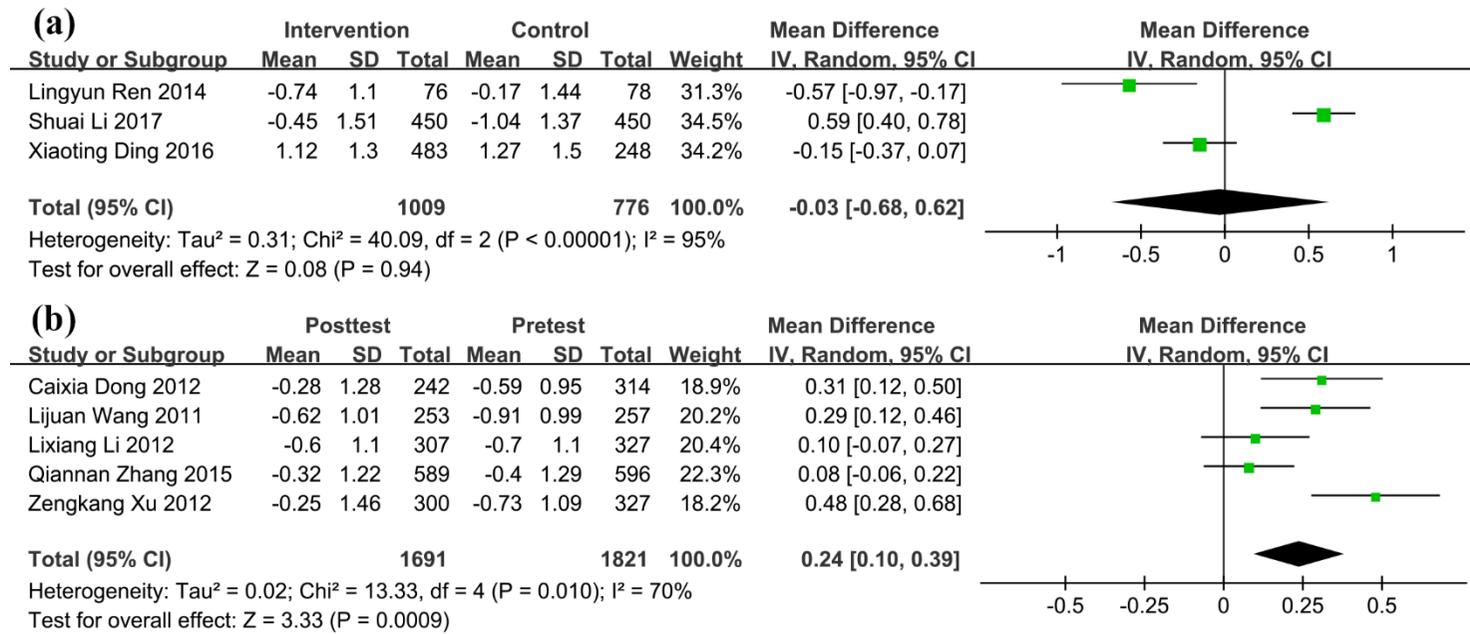


Figure S4: Effects of YYB on height-for-age z score (HAZ) among post-only with concurrent control studies (a) and pre-post studies (b) using mean difference as the effect measure.

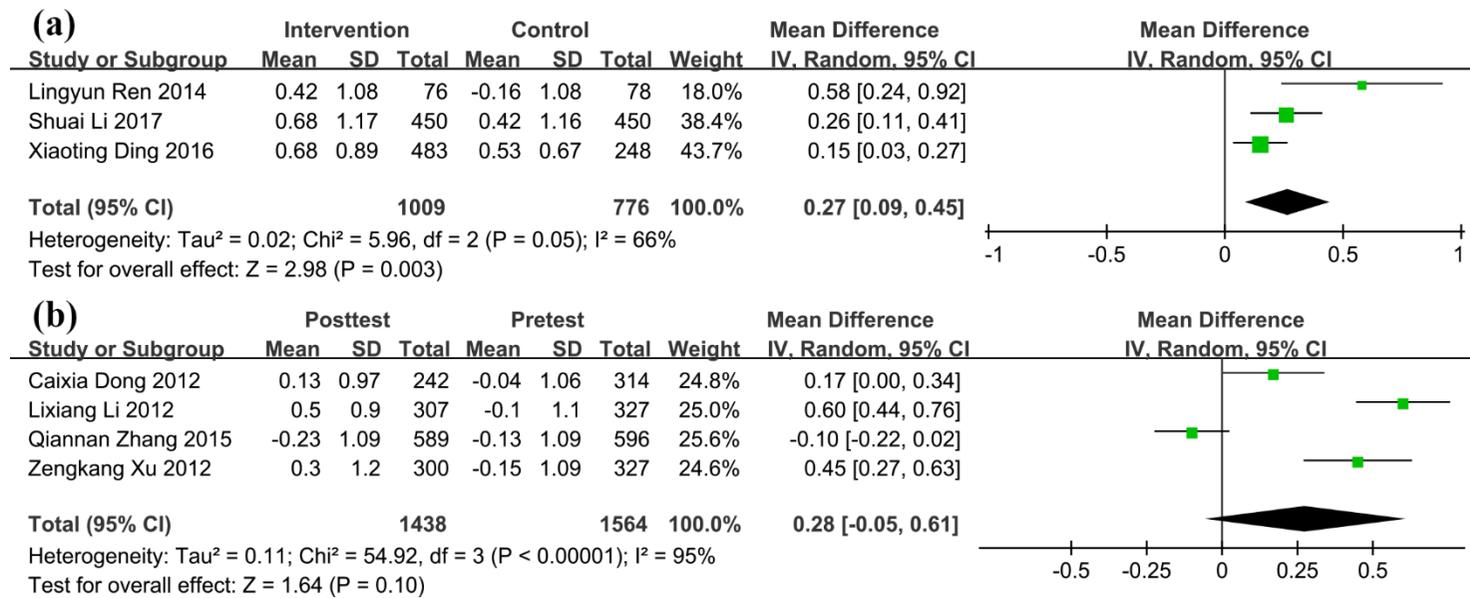


Figure S5: Effects of YYB on weight-for-height z score (WHZ) among post-only with concurrent control studies (a) and pre-post studies (b) using mean difference as the effect measure.

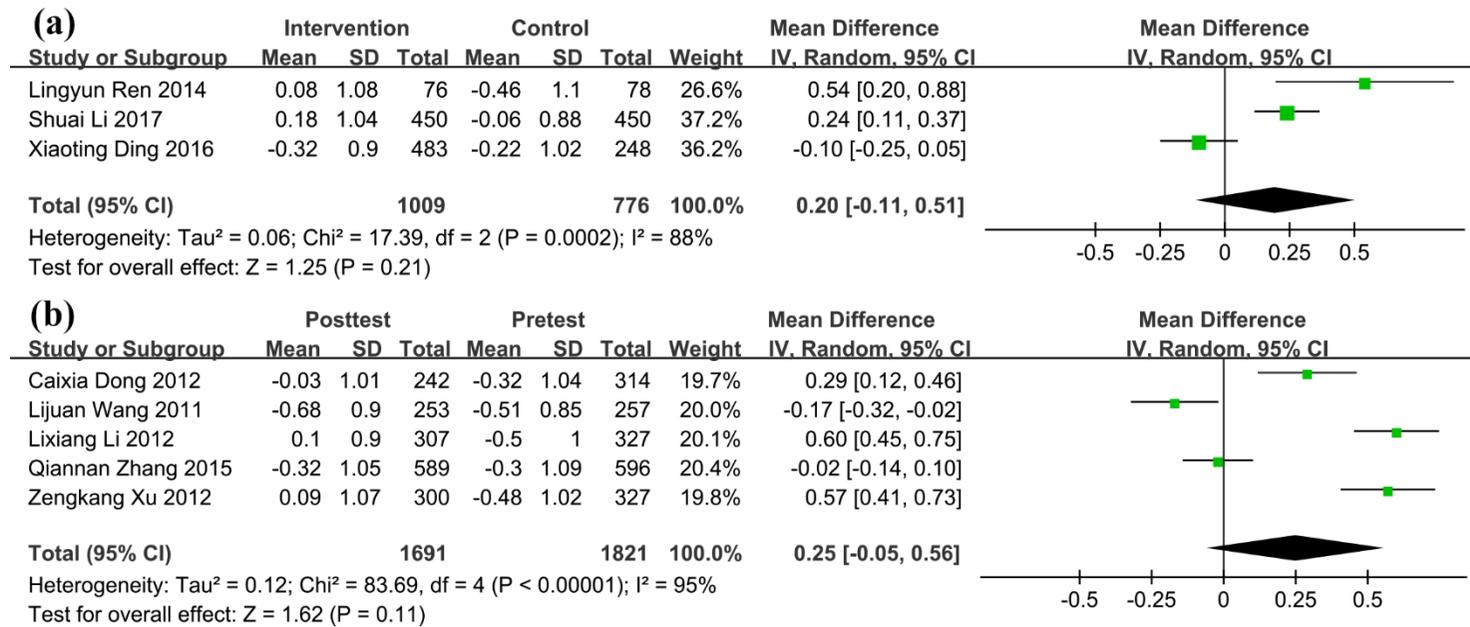


Figure S6: Effects of YYB on weight-for-age z score (WAZ) among post-only with concurrent control studies (a) and pre-post studies (b) using mean difference as the effect measure.

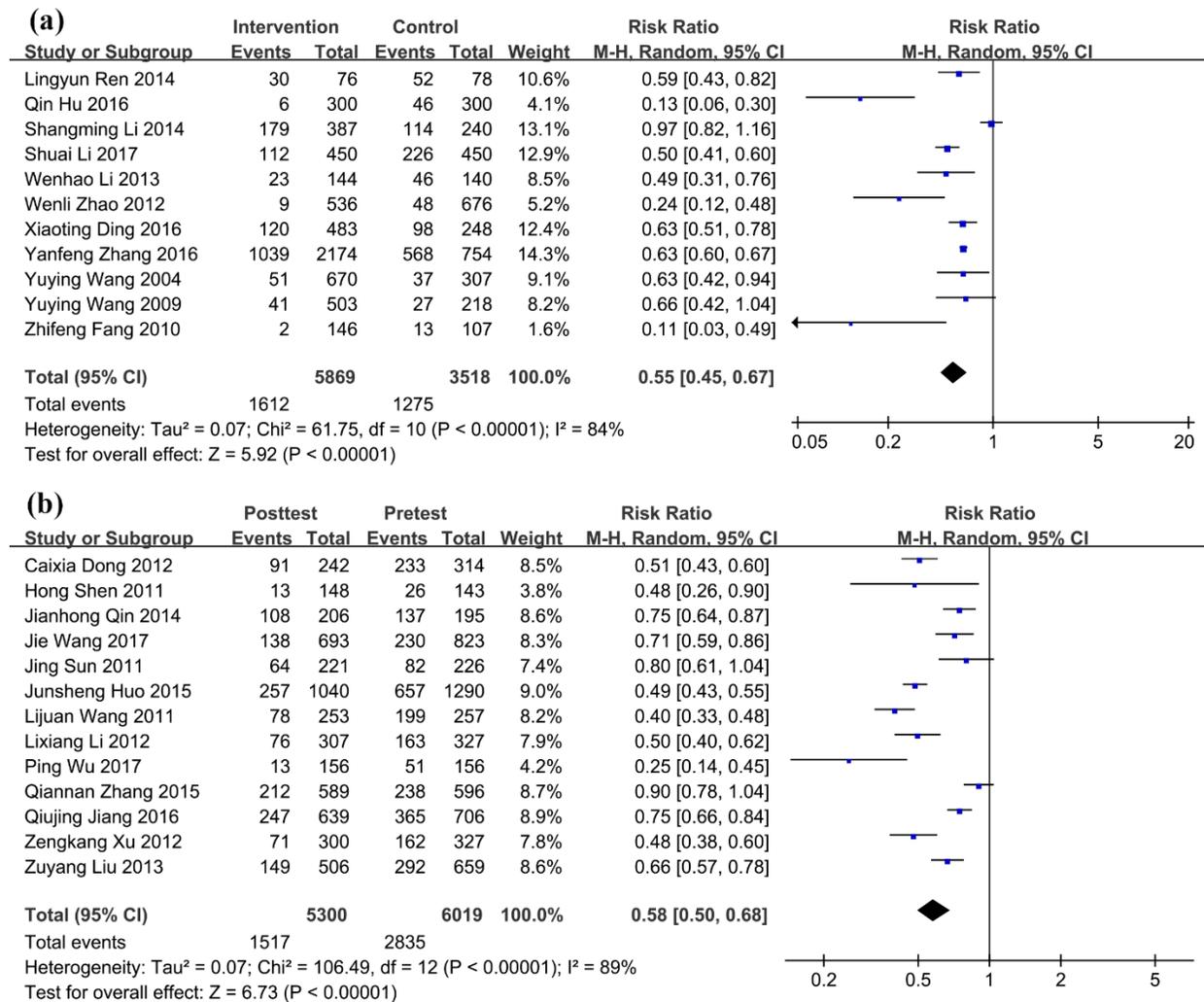


Figure S7: Effects of YYB on anemia prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk ratio as the effect measure.

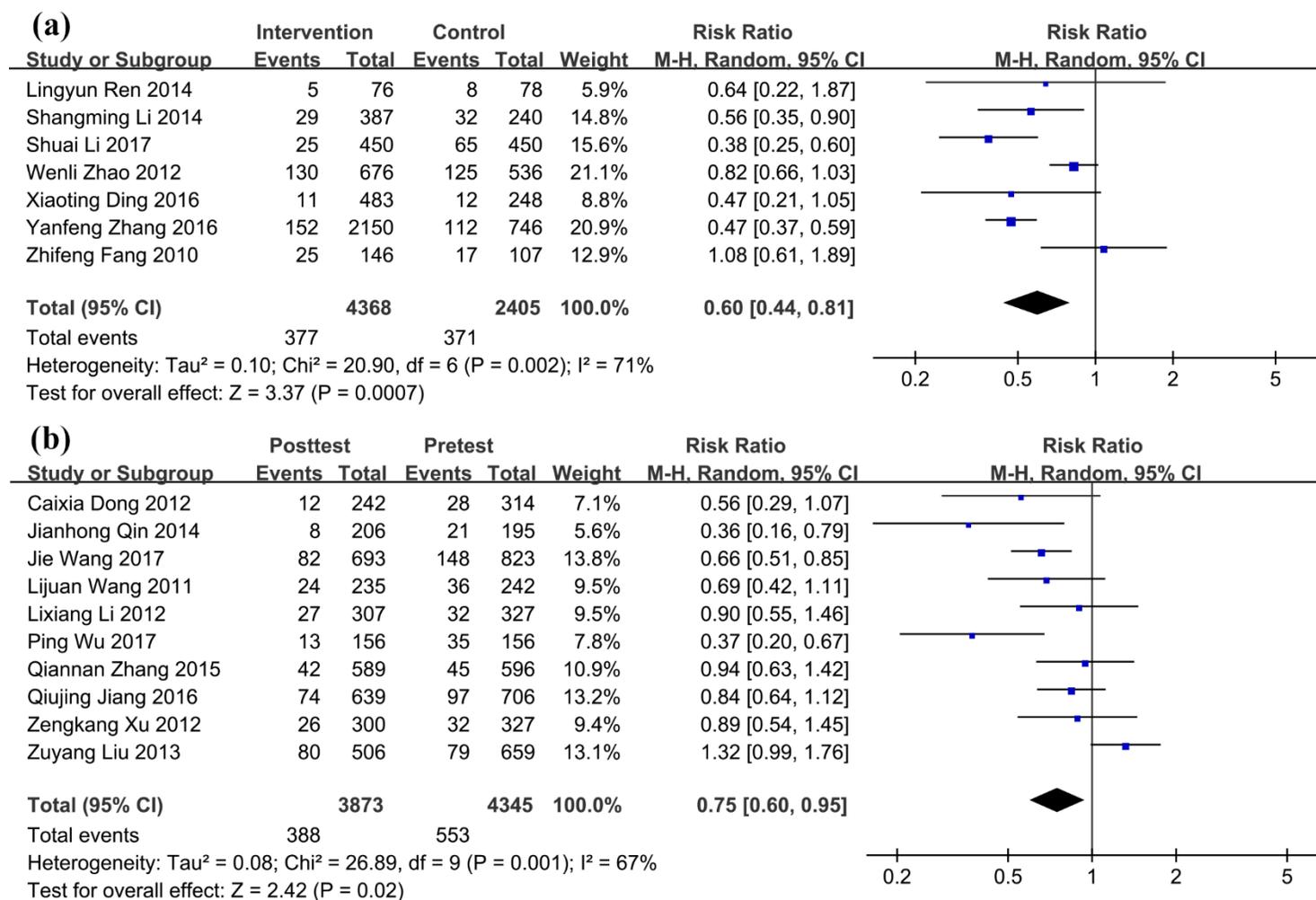


Figure S8: Effects of YYB on stunting prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk ratio as the effect measure.

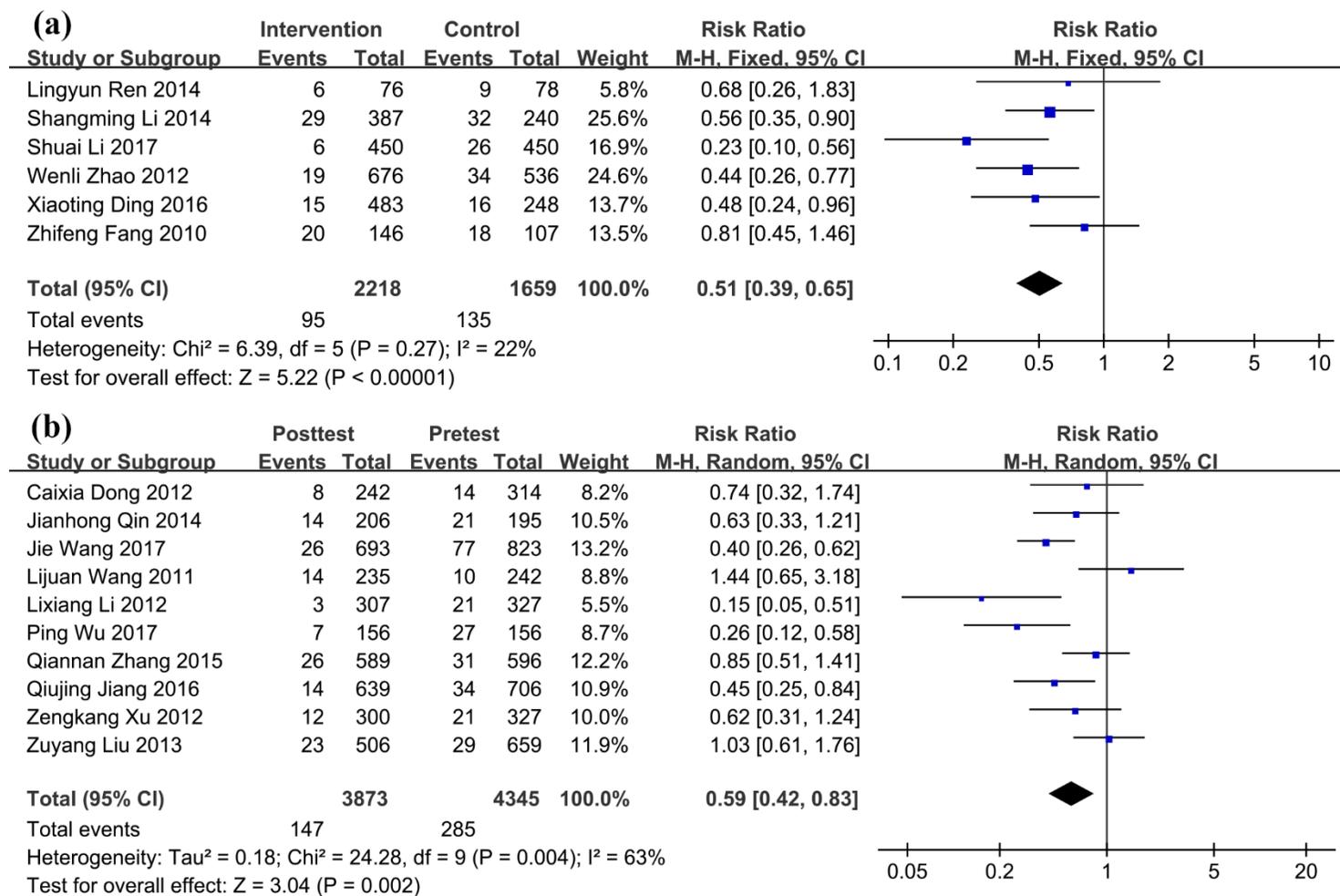


Figure S9: Effects of YYB on underweight prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk ratio as the effect measure.

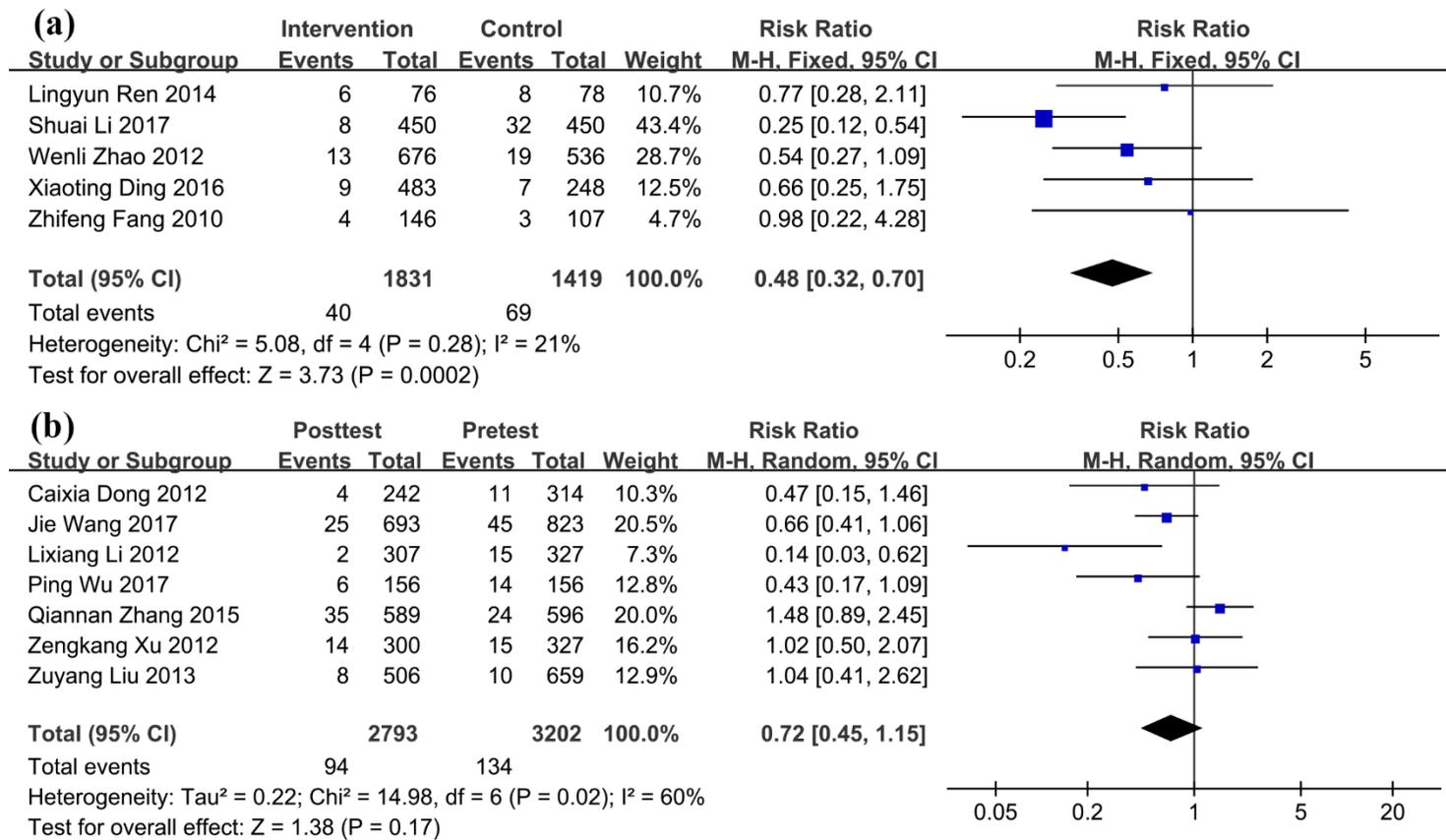


Figure S10: Effects of YYB on wasting prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk ratio as the effect measure.

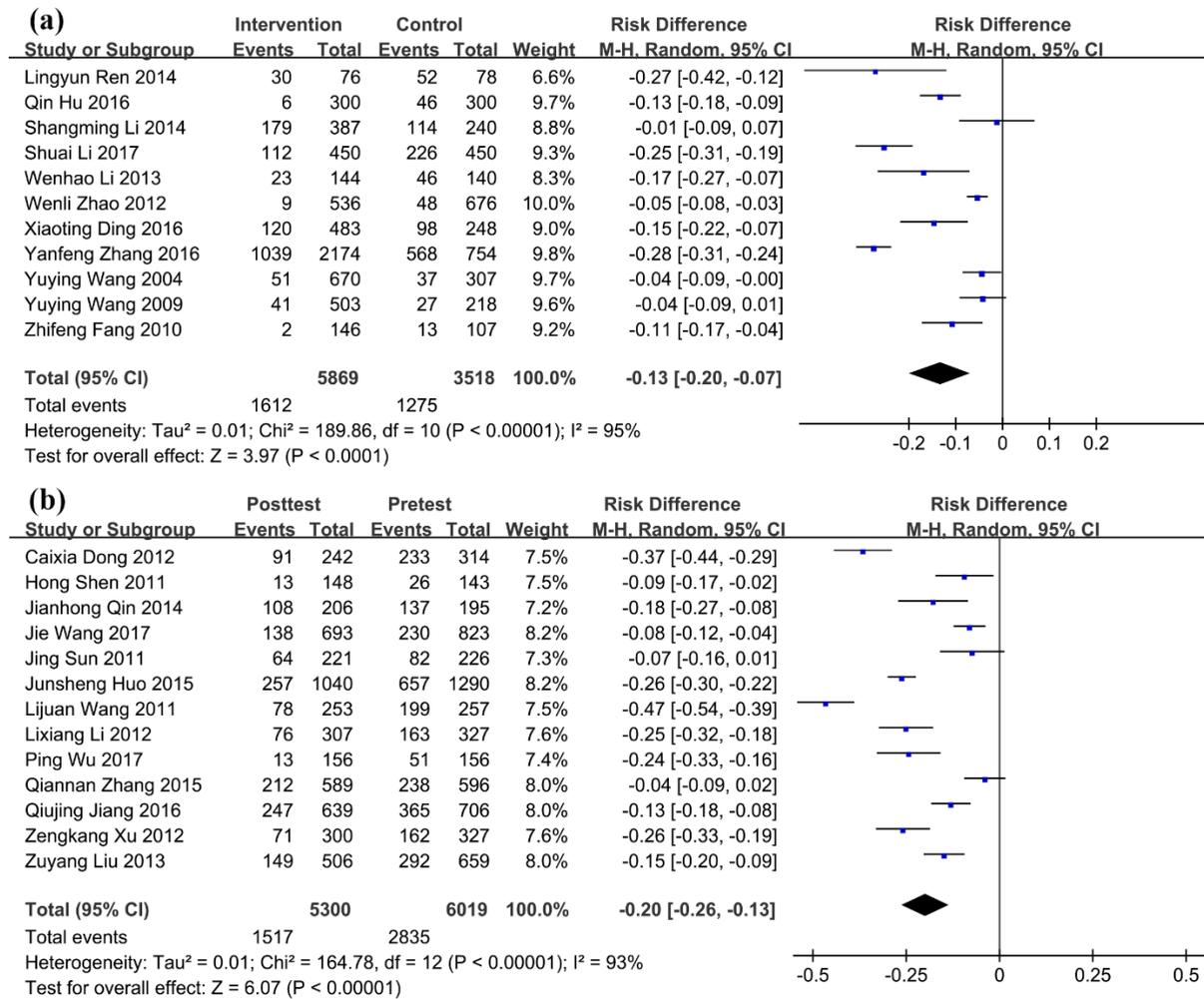


Figure S11: Effects of YYB on anemia prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk difference as the effect measure.

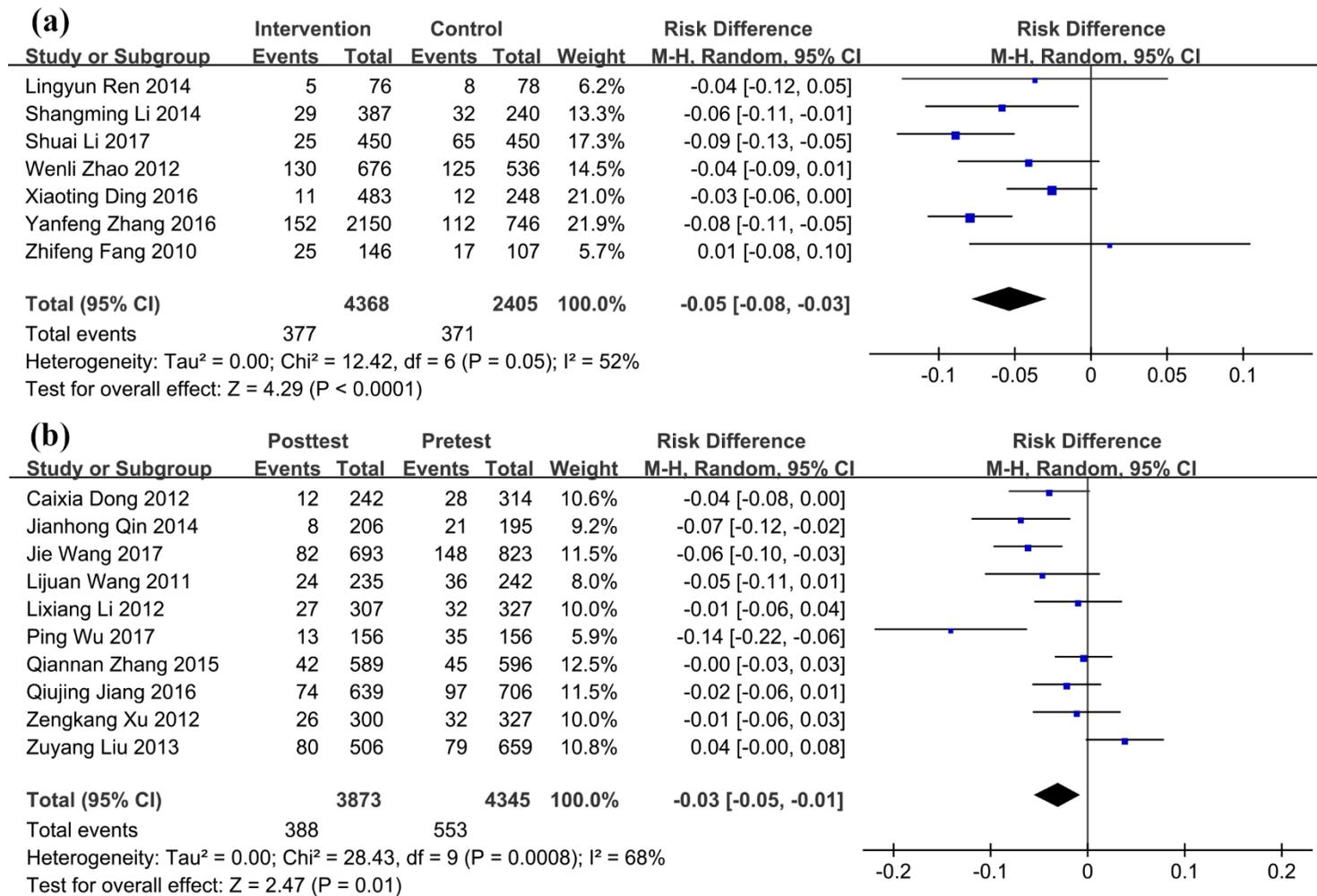


Figure S12: Effects of YYB on stunting prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk difference as the effect measure.

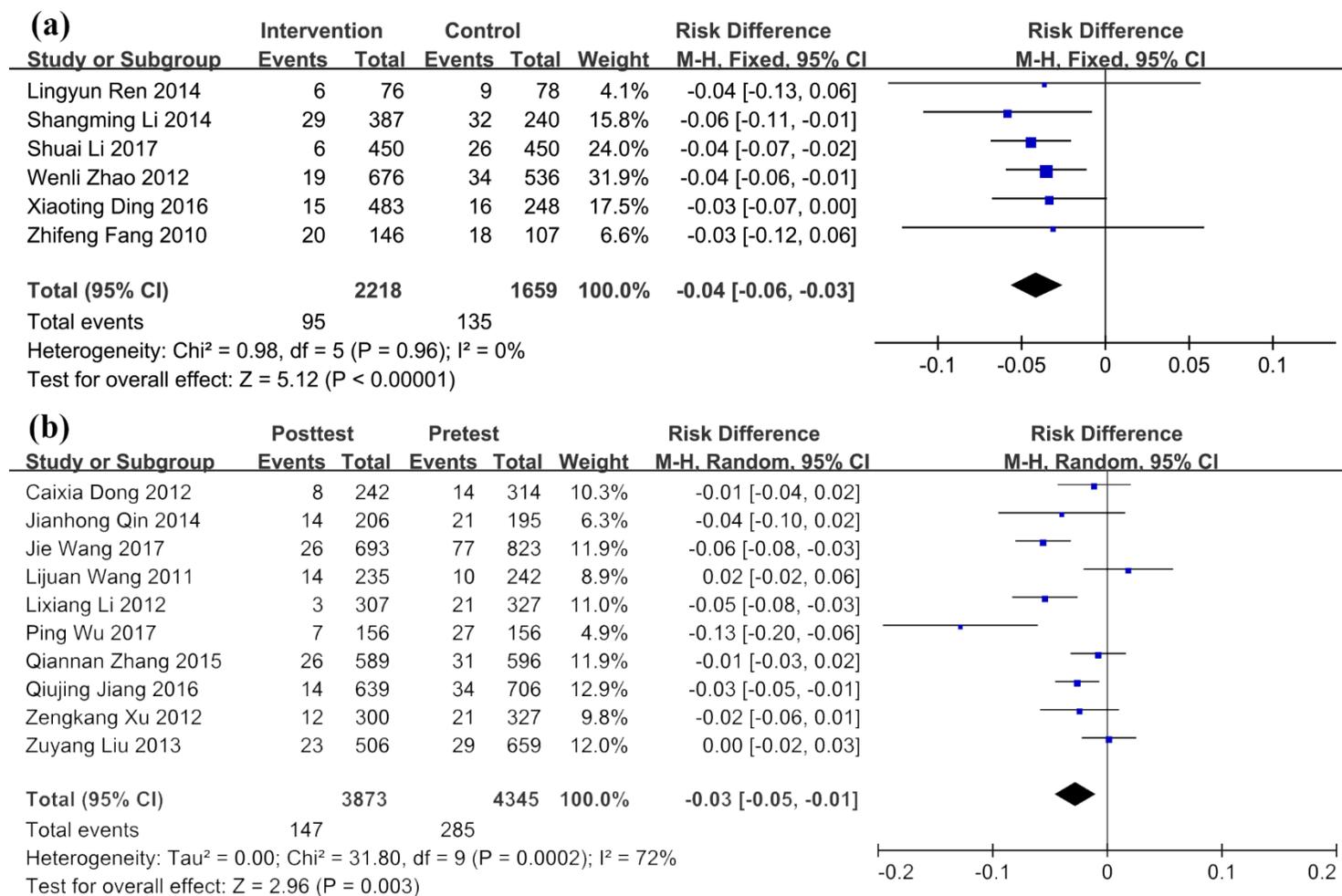


Figure S13: Effects of YYB on underweight prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk difference as the effect measure.

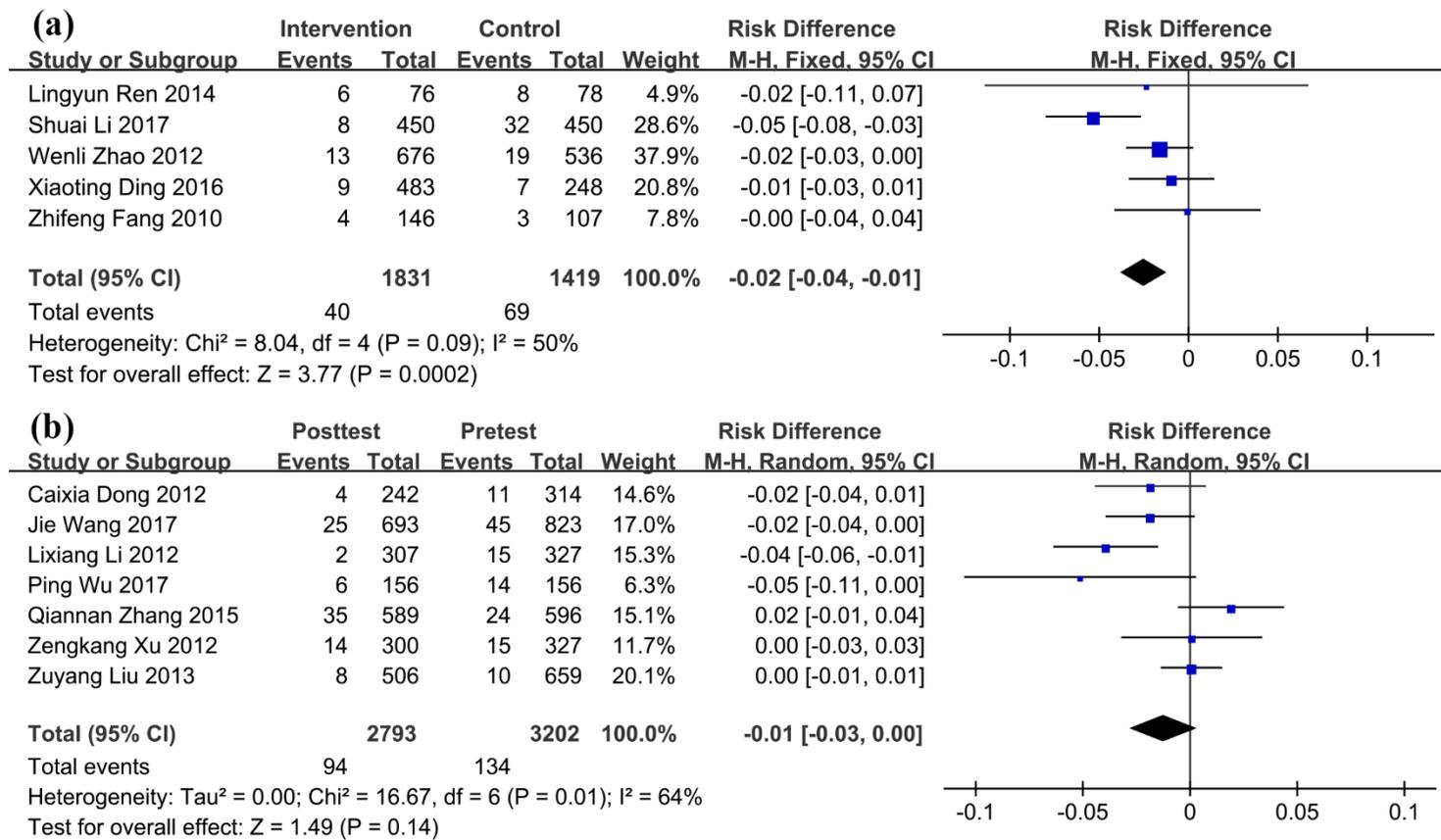


Figure S14: Effects of YYB on wasting prevalence among post-only with concurrent control studies (a) and pre-post studies (b) using risk difference as the effect measure.

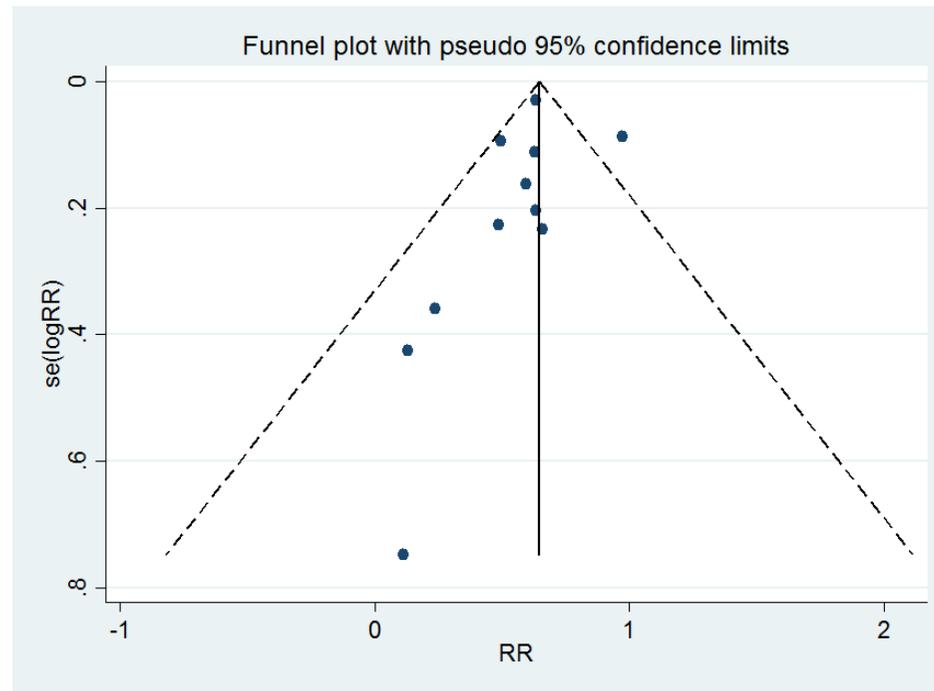


Figure S15: Funnel plot of effects of YYB on anemia prevalence among post-only with concurrent control studies.

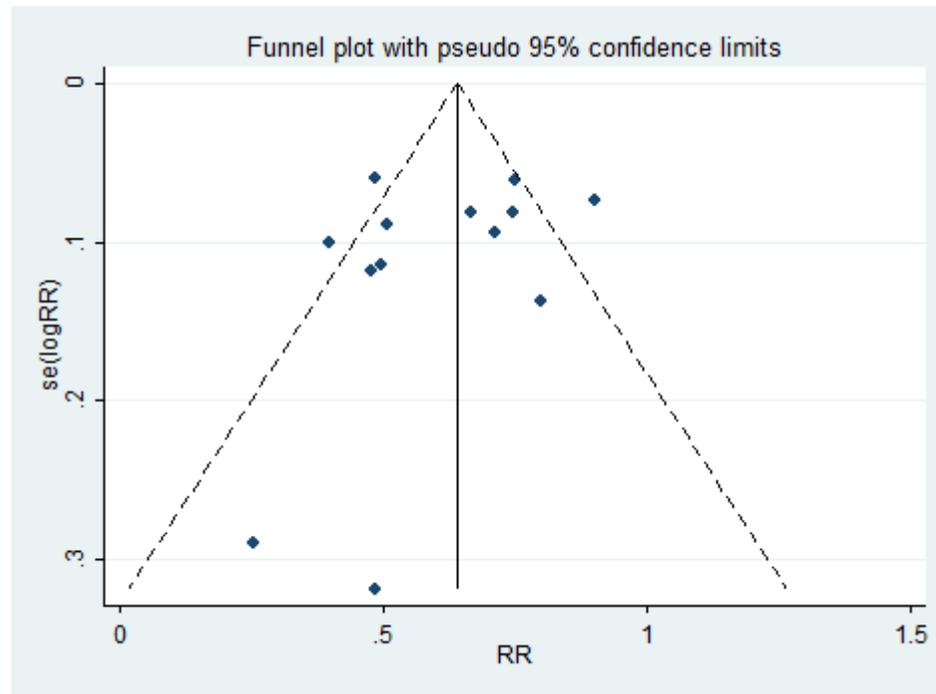


Figure S16: Funnel plot of effects of YYB on anemia prevalence among pre-post studies.