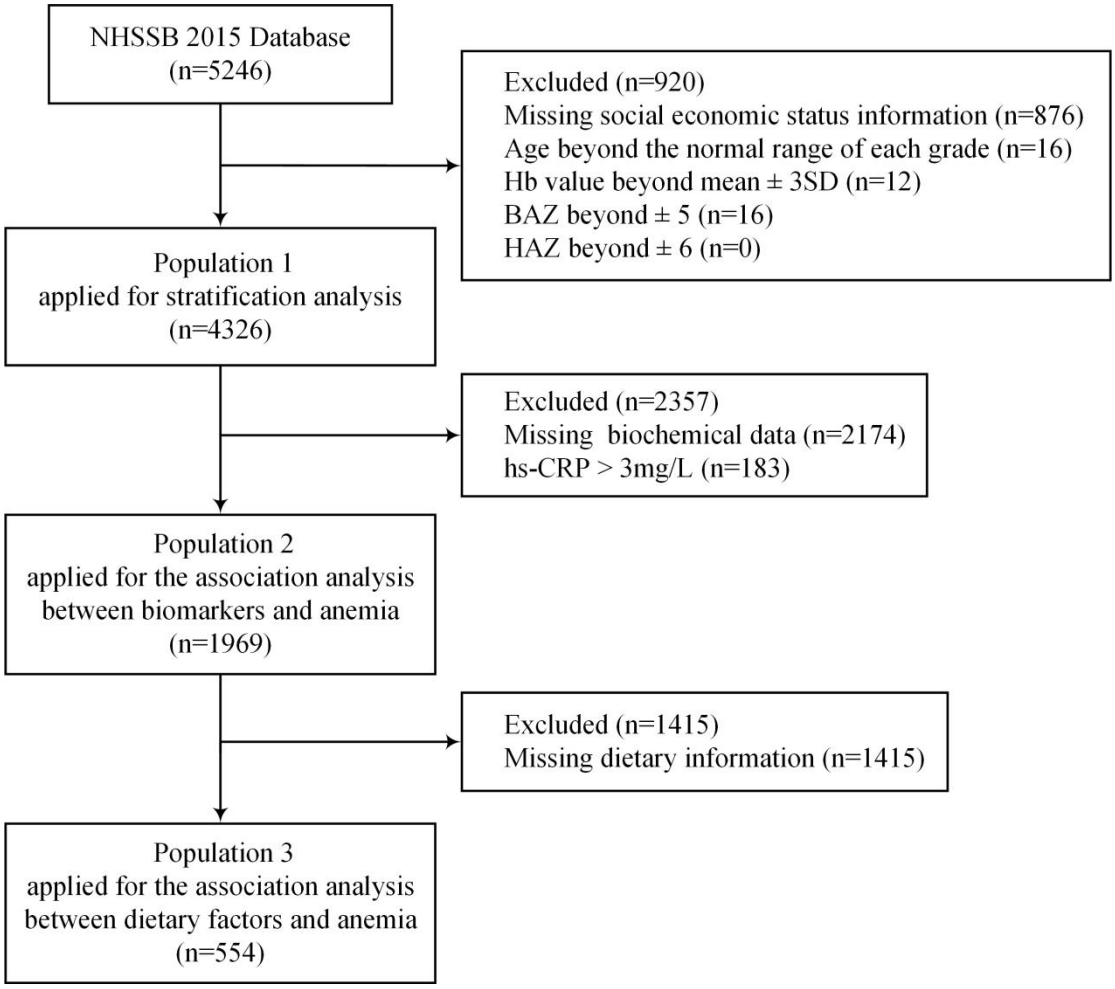
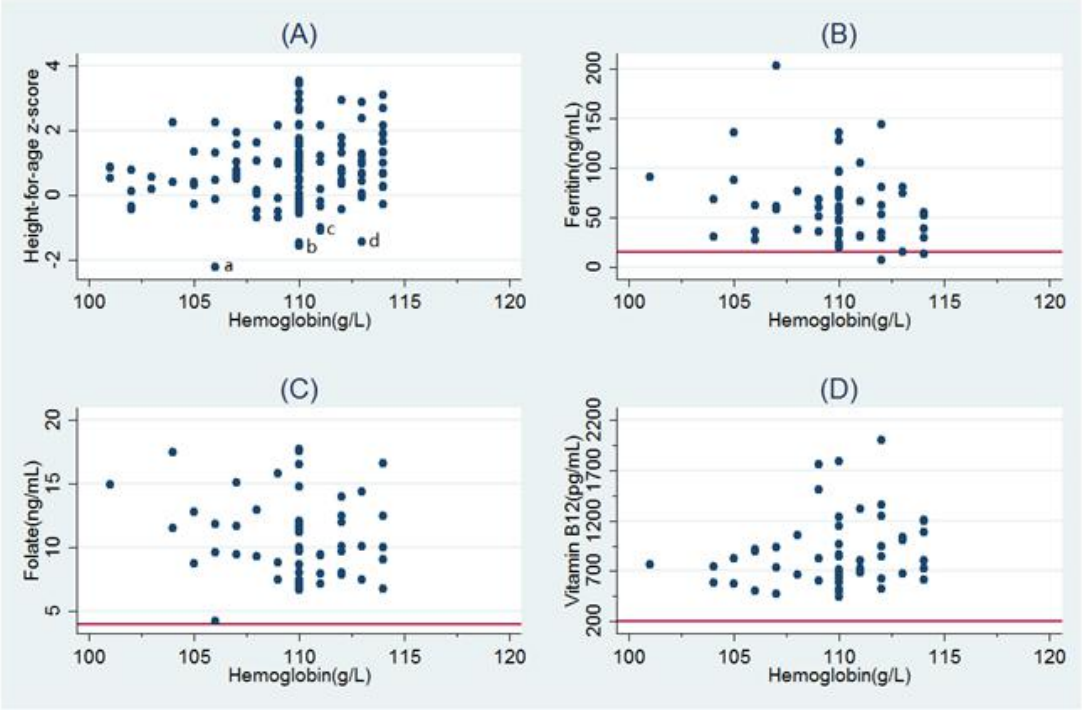


Supplementary Figure 1：Inclusion and exclusion criteria of participants extracted from the Nutrition and Health Surveillance in Schoolchildren of Beijing (NHSSB). HAZ: Height-for-age Z-score; BAZ: Body mass index-for-age Z-score; hs-CRP: high-sensitivity C-reactive protein; Hb: hemoglobin



Supplementary Figure 2：Distributions of HAZ, serum ferritin, folate, and vitamin B_{12} with Hb in anemic children. (A) Height-for-age Z-score (HAZ) distribution in anemic children. There were only 4 (labeled as a, b, c, d) out of 56 children whose HAZ were below –l. Case a: an urban 7.0-years-old boy, HAZ –2.14, Hb 106 g/L, ferritin 62.3 ng/ml, folate 4.21 ng/ml, and vitamin B_{12} 917.0 pg/ml; Case b: a rural 6.9-years-old boy, HAZ –1.56, Hb 110 g/L, ferritin 77.6 ng/ml, folate 6.95 ng/ml, and vitamin B_{12} 624.8 pg/ml; Case c: a rural 6.1-years-old girl, HAZ –1.09, Hb 111 g/L, ferritin 31.4 ng/ml, folate 9.49 ng/ml, and vitamin B_{12} 1317.0pg/ml; Case d: a rural 6.3-years-old girl, HAZ –1.45, Hb 113 g/L, ferritin 74.4 ng/ml, folate 7.51 ng/ml, and vitamin B_{12} 675.1pg/ml. (B) Ferritin distribution in anemic children. The red line indicates the threshold of ferritin (15 ng/ml) and 3 had iron deficiency among all 56 anemic children. (C,D) Folate and Vitamin B_{12} distribution in anemic children, respectively. The red lines indicate the thresholds of folate (4 ng/ml) or vitamin B_{12} (203.25 pg/mL), and no one had folate or vitamin B_{12} deficiency among all anemic children.

Supplementary Table 1: Characteristics of participants in study population 2 (*n*=1969).

Items	Non-anemia	Anemia	*P* value*
N	1913 (97.2)	56 (2.8)	
Age (year)	**8.6 ± 1.7**	**7.2 ±1.1**	**<0.001**
Boy	968 (50.6%)	25(44.6%)	0.379
Rural	**1112 (58.1)**	**48 (85.7)**	**<0.001**
Household income per capita per year			0.441
<20,000 Yuan/year	277(14.5)	6 (10.7)	
20,000–39,999 Yuan/year	431(22.5)	9 (16.1)	
40,000–69,999 Yuan/year	560(29.3)	17 (30.4)	
≥70,000 Yuan/year	645(33.7)	24 (42.8)	
Caregiver's education			0.783
< higher education	717（37.5）	22 (39.3)	
≥ higher education	1196（62.5）	34 (60.7)	
Hemoglobin (g/L)	**129 ± 9**	**110 ± 3**	**<0.001**
Height (cm)	**135.4 ± 11.6**	**126.2 ± 8.8**	**<0.001**
Weight (kg)	**32.7 ± 10.2**	**25.9 ±5.4**	**<0.001**
HAZ	0.83 (0.18, 1.53)	0.81(0.15, 1.33)	0.608
BAZ	0.36(–0.41, 1.41)	–0.03(–0.44, 0.77)	0.084
Ferritin (ng/mL)	56.1 (41.7, 75.5)	57.6 (33.5, 73.8)	0.457
Iron deficiency (%)	**11 (0.6)**	**3 (5.4)**	**0.006**
sTfR (mg/L)	4.02 ± 1.06	4.20 ±1.50	0.221
Vitamin B_{12} (pg/mL)	797.8 ± 334.0	856.5 ± 344.8	0.195
Vitamin B_{12} deficiency	4 (0.2)	0	1.000
Folate (ng/ml)	10.12 ± 3.38	10.92 ± 3.16	0.080
Folate deficiency	12 (0.6)	0	1.000
Vitamin A (umol/L)	1.50 ± 0.33	1.48 ± 0.31	0.656
Vitamin A deficiency	3(0.2)	0	1.000
Vitamin D (ng/mL)	21.83 ± 7.73	22.67 ± 7.88	0.427
Serum Zinc(umol/L)	12.72 ± 1.62	12.51 ±1.31	0.347
Total protein (g/L)	74.0 ± 3.9	72.9 ± 4.3	0.043
Albumin (g/L)	47.3 ± 2.1	46.9 ± 2.1	0.115
hs-CRP (mg/L)	0.19 (0.07,0.56)	0.21 (0.09,0.72)	0.746
Supplements intake	**579 (30.3)**	**9 (16.1)**	**0.022**

Data are presented as n (%) or mean±standard deviation or median (P_{25}, P_{75}).

*Student's *t*-test was applied for the comparison of continuous variables (normal distribution) and χ^2 for categorical variables (Pearson's or Fisher's exact test was applied as appropriate). The Wilcoxon rank-sum test was implemented to detect the median disparities. HAZ: Height-for-Age Z-score; BAZ: BMI-for-Age Z-score; sTfR:soluble transferrin receptor; hs-CRP: high-sensitivity C-reactive protein.

Supplementary Table 2: **The nutrients intake in non-anemia and anemia participants in study population 3 (*n*=554).**

Items	Non-anemia	Anemia	*P* value
Participants	535	18	
Age (year)	**8.6 ± 1.6**	**7.3 ±1.4**	**0.002**
Boy	275 (51.4)	8 (44.4)	0.561
Rural	**311 (58.1)**	**3 (16.7)**	**0.033**
Household income per capita per year			0.368
<20000 yuan	78 (14.6)	1 (5.6)	
20000–39999 yuan	120 (22.4)	2 (11.1)	
40000–69999 yuan	152 (28.4)	7 (38.9)	
≥70000 yuan	185 (34.6)	8 (44.4)	
Caregiver's education			0.824
< higher education attainment	192 (35.9)	6 (33.3)	
≥higher education attainment	343 (64.1)	12 (66.7)	
Hemoglobin (g/L)	**130 ± 9**	**110 ±3**	**<0.001**
Height(cm)	**135.3 ± 11.5**	**126.2 ± 11.2**	**0.001**
Weight (Kg)	**32.6 ± 9.8**	**25.7 ± 5.2**	**0.003**
HAZ	0.83(0.25, 1.62)	0.44(-0.28,1.74)	0.269
BAZ	0.37 (–0.38, 1.47)	0.15(-0.55, 0.57)	0.196
Total energy (kcal)	1684 ± 559	1568 ± 461	0.383
Protein (g /1000kcal)	36.1 ± 7.5	36.4 ± 6.4	0.865
Fat (g/1000kcal)	39.4 ± 9.4	40.7 ± 9.8	0.555
Carbohydrate (g/1000kcal)	131.0 ± 22.1	127.3 ± 20.2	0.488
Vitamin A (μg RE /1000kcal)	315 ± 759	370 ± 365	0.759
Retinol (μg /1000kcal)	151 ± 743	177 ± 320	0.883
Thiamin (mg/1000kcal)	0.45 ± 0.12	0.49 ± 0.12	0.236
Riboflavin (mg/1000kcal)	0.54 ± 0.35	0.54± 0.13	0.986
Vitamin C (mg/1000kcal)	39 ± 25	38 ± 17	0.960
Vitamin E (mg/1000kcal)	13.82 ± 8.33	16.03± 7.61	0.268

Iron (mg/1000kcal)	11.1 ± 4.9	10.9 ± 3.1	0.844
Calcium (mg/1000kcal)	245 ± 107	240 ± 90	0.837
Zinc (mg/1000kcal)	5.66 ± 1.55	5.55 ± 0.77	0.766
Manganese (mg/1000kcal)	2.55 ± 1.22	2.38 ± 0.59	0.547
Copper (mg/1000kcal)	0.90 ± 0.37	0.86 ± 0.25	0.611
Supplements intake	172 (32.1)	5 (27.8)	0.628

Data are presented as *n* (%) or mean±standard deviation or median (P_{25},P_{75}).
*Student's t-test was applied for the comparison of continuous variables (normal distribution) and χ^2 for categorical variables (Pearson's or Fisher's exact test was applied as appropriate). The Wilcoxon rank-sum test was implemented to detect the median disparities. HAZ: Height-for-age Z-score; BAZ: BMI-for-age Z-score.

Supplementary Table 3: Association between dietary nutrients intake and Hb by multivariable linear regression* in study population 3(*n*=553†).

Hb	β	*P* value	95% CI
Sex (ref:boy)	**1.790**	**0.023**	**0.252, 3.329**
Age	**1.732**	**<0.001**	**1.273, 2.191**
HAZ	0.464	0.240	− 0.312, 1.240
BAZ	**0.650**	**0.050**	**0.001, 1.298**
Caregiver's ducational attainment	1.253	0.179	− 0.577, 3.084
Income	− 0.404	0.340	− 1.235, 0.427
Rural	− 0.282	0.732	− 1.898, 1.334
Supplements	− 1.009	0.221	− 2.627, 0.610
Total energy (kcal)	0.001	0.268	− 0.001, 0.002
Protein (g/1000 kcal)	− 0.212	0.093	− 0.461, 0.036
Fat (g/1000 kcal)	− 0.445	0.065	− 0.917, 0.028
Carbohydrate (g/1000 kcal)	− 0.150	0.154	− 0.357, 0.056
Vitamin A (μg RE /1000 kcal)	− 0.006	0.067	− 0.012, 0.000
Retinol (μg/1000 kcal)	0.005	0.153	− 0.002, 0.012
Thiamin (mg/1000 kcal)	− 3.952	0.289	− 11.272, 3.367
Riboflavin (mg/1000 kcal)	2.293	0.621	− 6.804, 11.391
Vitamin C (mg/1000 kcal)	− 0.004	0.811	− 0.040, 0.031
Vitamin E (mg/1000 kcal)	0.070	0.173	− 0.031, 0.171
Iron (mg/1000 kcal)	− 0.073	0.548	− 0.312, 0.166
Calcium (mg/1000 kcal)	− 0.002	0.684	− 0.013, 0.009

Zinc (mg/1000 kcal)	0.634	0.141	− 0.211, 1.479
Copper (mg/1000 kcal)	1.997	0.121	− 0.528, 4.523
Manganese (mg/1000 kcal)	0.233	0.555	− 0.541, 1.007

* All the list variates were listed as co-variables into multivariable linear regression.
† 1 child with IDA was excluded. HAZ: Height-for-age Z-score; BAZ: BMI-for-age Z-score; Hb: hemoglobin; CI: confidence interval.

Supplementary Table 4: Change trends of anthropometry and Hb with age in population 1 (*n*=4326).

Items	**Tertile1*** **(*n*=1449)**	**Tertile2 (*n*=1449)**	**Tertile3 (*n*=1428)**	$P_{\text{trend value}}$
Age (year)	**6.6±0.4**	**8.6±0.3**	**10.6±0.4**	**<0.001**
Sex (boys%)	742 (51.2)	705 (48.6)	762 (53.4)	0.252
Height (cm)	**123.6±5.5**	**134.7±6.2**	**147.3±7.5**	**<0.001**
Weight (kg)	**25.4±5.3**	**31.9±7.7**	**41.5±11.0**	**<0.001**
HAZ	0.90±0.98	0.81±1.02	0.92±1.10	0.805
BAZ	**0.55±1.34**	**0.55±1.34**	**0.60±1.37**	**0.047**
Hemoglobin (g/L)	**125.33±9.10**	**128.78±8.83**	**131.44±9.35**	**<0.001**
Anemia (%)	**100（6.9%）**	**29（2.0%）**	**9（0.6%）**	**<0.001**

* The tertiles was separated by age. HAZ: Height-for-age Z-score; BAZ: BMI-for-age Z-score.

Supplementary Table 5: The changes of Hb and anemia from 2015 to 2017 in children who were anemic at baseline.

Items	**Year 2015 (baseline)**		**Year 2017**		
	Age (year)	**Hb (g/L)**	**Age (year)**	**Hb (g/L)**	**Cases of children remaining anemic**
Study population 1 (n=4326)					
Total (*n*=104) *	7.0±0.9	110±3	9.2±0.9	128±9	5
Grade 1 (*n*=78)	6.5±0.3	110±3	8.7±0.3	127±9	3
Grade 3 (*n*=26)	8.5±0.3	110±3	10.7±0.3	128±9	2
Study population 2 (*n*=1969)					
Total (*n*=45) †	7.1±0.9	110±3	9.3±0.9	129±10	2
Grade 1 (*n*=33)	6.6±0.3	110±3	8.8±0.3	129±10	1
Grade 3 (*n*=12)	8.6±0.3	110±3	10.8±0.3	128±10	1

* For the study population 1, 104 of 136 anemic cases in 2015 (78 in Grade 1 and 26 in Grade 3) were traced to 2017 and only 5 cases remained as anemia in 2017.
† For the study population 2, 45 of 56 anemic cases in 2015 (33 in Grade 1 and 12 in Grade 3) were traced to 2017 and only 2 cases remained as anemia in 2017.