Supplementary material

Appendix 1. Haemoglobin concentration for diagnosis of anaemia in this study

According to the World Health Organization recommendations, Anaemia is a condition in which the number of red blood cells is insufficient to meet the body's physiologic needs. Specific physiologic needs vary with a person's age, gender, residential elevation above sea level, and so on. The aim of this study is to estimate prevalence of anaemia among non–pregnant women of reproductive age (15–49 years). Hence, we chose 120g/L haemoglobin concentration as the threshold of anaemia (Table 1).

Table 1. Haemoglobin levels to diagnose anaemia for population of different age (g/L).

Population	**Non – Anaemia**	**Anaemia**		
		Mild	**Moderate**	**Severe**
Children 6–59 months of age	110 or higher	100–109	70–99	Lower than 70
Children 5–11 years of age	115 or higher	110–114	80–109	Lower than 80
Children 12–14 years of age	120 or higher	110–119	80–109	Lower than 80
Non–pregnant women (15 years of age and above)	**120 or higher**	**110–119**	**80–109**	**Lower than 80**
Pregnant women	110 or higher	100–109	70–99	Lower than 70
Men (15 years of age and above)	130 or higher	110–129	80–109	Lower than 80

Residential elevation above sea level (altitude) is known to increase haemoglobin concentrations and then causes underestimation of anaemia in the population. According to the recommendations, adjustments should be made to the measured haemoglobin concentration among persons living at altitudes higher than 1000 metres above sea level (Table 2).

Table 2. Altitude adjustments to measured haemoglobin concentrations.

Altitude (meters above sea level)	**Measured Hb concentration adjustment (g/L)**
1000–1499	-2
1500–1999	-5
2000–2499	-8
2500–2999	-13
3000–3499	-19
3500–3999	-27
4000–4499	-35
≥4500	-45

Then, we obtained average altitudes for each city in the studies from Chinese census and identified 34 cities in 10 provinces with average altitudes higher than 1000 meters. Haemoglobin concentrations of participants living in these cities were adjusted according to the criteria in Table. After that, anaemia was newly defined using the modified haemoglobin concentration.

Table 3. Modified haemoglobin concentration in this study.

Province	**prefecture–level cities**	**Altitude (meters above sea level)**	**Measured Hb concentration adjustment (g/L)**
Gansu	Lanzhou	1517	-5
	Tianshui	1142	-2
	Pingliang	1347	-2
	Jiuquan	1477	-2
	Qingyang	1268	-2
Guizhou	Liupanshui	1753	-5
	Bijie	1651	-5
	Guiyang	1074	-2
	Anshun	1393	-2
Inner Mongolia	Hohhot	1063	-2
	Baotou	1067	-2
	Ulanqab	1300	-2
Ningxia	Guyuan	1753	-5
	Yinchuan	1111	-2
Qinghai	Xining	2261	-8
Shanxi	Lvliang	1188	-2
	Jinzhong	1121	-2
Sichuan	Liangshan	2439	-8
	Panzhihua	1056	-2
Xizang	Lhasa	3658	-27
Xinjiang	Kashi	1104	-2
	Aksu	1289	-2
	Bayingol Mongolian	1498	-2
Yunnan	Qujing	2019	-8
	Dali	2168	-8
	Kunming	1891	-5
	Yuxi	1637	-5
	Baoshan	1654	-5
	Zhaotong	1950	-5
	Lincang	1647	-5
	Honghe	1502	-5
	Puer	1401	-2
	Wenshan	1320	-2
	Xishuangbanna	1103	-2
	Chuxiong	3657	-27

Appendix 2. Multiple imputation for independent variables

We performed a multiple imputation based on Markov Chain Monte Carlo (MCMC) to impute the missing values for some important metabolic factors, which were assumed to be associated with anaemia, including BMI, SBP, DBP, FBG, TC, TG, UA, and Cr. The PROC MI procedure in SAS was used to complete the imputation. In detail, we assume that these variables coincide with multinormal distribution. Then, we built separate multiple variable model to estimate the missing values for each variable, with the limitation of maximum and minimum imputed values based on the range of each variable in samples. We repeated the process 10 times and used the average of them as the imputation results. The missing rates of these variables and comparison of values between data before and after imputation were shown in the below table.

Variable	Missing (n, %)	Before imputation			After imputation		
		Mean±SD	Median (P25, P75)	Range (Min,Max)	Mean±SD	Median (P25, P75)	Range (Min,Max)
BMI	4431 (0.11)	22.6 (3.3)	22.1 (20.2, 24.4)	15.0, 40.0	22.6 (3.3)	22.1 (20.2, 24.4)	12.3, 40.0
SBP	4912 (0.12)	113.5 (14.5)	112 (103,121)	70.0, 250.0	113.5 (14.5)	112 (103,121)	70.0, 250.0
DBP	4992 (0.12)	69.7 (10.3)	69 (62, 76)	40.0, 177.0	69.7 (10.3)	69.0 (62.0, 76.0)	40.0, 177.0
FBG	129 004 (3.08)	5.0 (0.8)	4.9 (4.6, 5.3)	1.0, 34.0	5.0 (0.8)	4.9 (4.6, 5.3)	1.0, 34.0
TC	141 253 (3.38)	4.6 (0.8)	4.5 (4.0, 5.1)	2.5, 10.5	4.6 (0.8)	4.5 (4.0, 5.1)	2.5, 10.5
TG	145 423 (3.48)	1.1 (0.7)	0.9 (0.7, 1.3)	0.1, 10.0	1.1 (0.7)	0.9 (0.7, 1.3)	0.1, 10.0
UA	253 569 (6.06)	270.4 (64.8)	264 (226, 308)	0.6, 1013	270.5 (63.3)	265 (228, 306)	0.6, 1713
Cr	173 824 (4.15)	55.5 (9.5)	54.7 (49.3,60.5)	30.0, 1756.0	55.5 (9.4)	54.8 (49.6,60.2)	30.0, 1756.0

Abbreviations: BMI=body measure index. SBP=systolic blood pressure. DBP=diastolic blood pressure. FBG=fasting blood glucose. TC= total cholesterol. TG=triglyceride. UA=blood uric acid. Cr=serum creatinine.

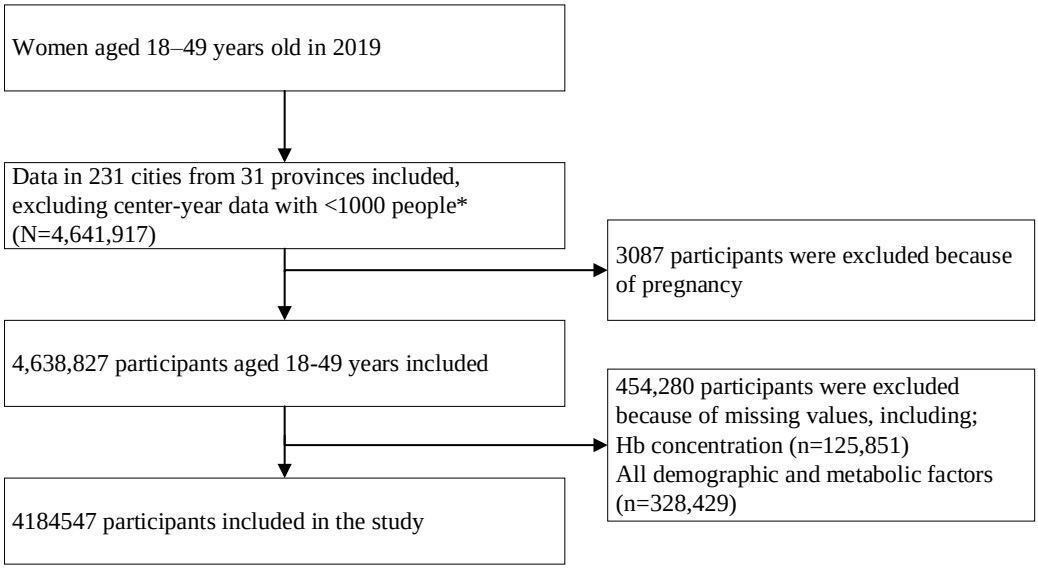

Fig. S1 Flow chart of the study.

Note: * The center was excluded from the study when the total number of women who participated in health examination were less than 1000.

Table S1 Comparison of characteristics between eligible and excluded participants.

	Eligible	**Exclude**	***P* value**
N	4 184 547	454 280	NA
Age (years)	35.4±7.8	32.5±9.0	< 0.0001
Hb concentration	129.7±12.7	129.3±12.7	0.07
Anaemia			0.07
No	3 522 441 (84.2)	273 823 (83.4)	
Yes	662 106 (15.8)	54 606 (16.6)	
Age group			
18–24	330 171 (7.9)	107 625 (23.7)	< 0.0001
25–29	781 313 (18.7)	94 675 (20.8	
30–34	939 018 (22.4)	77 139 (17.0)	
35–39	755 231 (18.1)	53 271 (11.7)	
40–44	647 885 (15.5)	53 104 (11.7)	
45–49	730 929 (17.5)	68 466 (15.1)	
Body mass index			
<18.5	327 463 (7.8)	46 644 (10.3)	< 0.0001
18.5–23.9	2 643 780 (63.2)	274 455 (60.5)	
24.0–27.9	925 721 (22.2)	98 257 (21.7)	
≥28.0	283 152 (6.8)	34 084 (7.5)	
Hypertension			0.17
No	3 892 038 (93.1)	422 660 (93.5)	
Yes	287 487 (6.9)	29 345 (6.5)	
Diabetes			0.0002
No	4 005 301 (98.8)	108 076 (98.3)	
Yes	50 577 (1.3)	1904 (1.7)	
High total cholesterol			0.13
No	3 164 057 (78.3)	36 248 (80.7)	
Yes	879 237 (21.8)	8684 (19.3)	
High triglyceride			0.0004
No	3 548 258 (87.9)	37 724 (85.9)	
Yes	490 866 (12.2)	6176 (14.1)	
Hyperuricemia			0.37
No	3 594 313 (91.4)	37 461 (90.2)	
Yes	336 665 (8.6)	4064 (9.8)	
Impaired kidney function			< 0.0001
No	4 18–704 (99.9)	454 217 (99.99)	
Yes	3843 (0.1)	63 (0.01)	
Adverse pregnancy			< 0.0001
No	3 935 304 (94.0)	444 017 (97.7)	
Yes	249 243 (6.0)	10 263 (2.3)	
Geographic region			0.0008
North	434 356 (10.4)	46 457 (10.2)	
East	1 530 917 (36.6)	175 526 (38.6)	

Central	573 584 (13.7)	60 255 (13.3)
South	550 629 (13.2)	32 793 (7.2)
Southwest	564 097 (13.5)	68 654 (15.1)
Northwest	202 093 (4.8)	35 475 (7.8)
Northeast	328 871 (7.9)	35 120 (7.7)

P values were calculated using Kruskal–Wallis t test for continuous variables and Rao–scott χ^2 test for categorical variables.

Continuous variables were presented with mean±SD and categorical variables with number and proportion.

Abbreviations: NA=not applicable.

Table S2 Comparison of characteristics between crude and weighted participants.

	Crude	Weighted
Anaemia		
Yes	662106 (15.8)	661 927 (15.8)
No	3 522 441 (84.2)	3 522 620 (84.2)
Age (years)	35.4±7.8	35.4±8.3
Age group		
18–24	330171 (7.9)	507 447 (12.1)
25–29	781313 (18.7)	631 059 (15.1)
30–34	939018 (22.4)	877 056 (21.0)
35–39	755231 (18.1)	699 362 (16.7)
40–44	647885 (15.5)	657 574 (15.7)
45–49	730929 (17.5)	812 050 (19.4)
Body mass index		
<18.5	327 472 (7.8)	325 585 (7.8)
18.5–23.9	2 646 106 (63.2)	2 629 606 (62.8)
24.0–27.9	927 319 (22.2)	941 997 (22.5)
≥28.0	283 650 (6.8)	287 360 (6.9)
Hypertension		
No	3 897 053 (93.1)	3 890 797 (93.0)
Yes	287 494 (6.9)	293 750 (7.0)
Diabetes		
No	4 133 964 (98.8)	4 132 727 (98.8)
Yes	50 583 (1.2)	51 820 (1.2)
High total cholesterol		
No	3 300 815 (78.9)	3 308 125 (79.1)
Yes	883 732 (21.1)	876 422 (20.9)
High triglyceride		
No	3 685 732 (88.1)	3 668 817 (87.7)
Yes	498 815 (11.9)	515 730 (12.3)
Hyperuricemia		
No	3 846 052 (91.9)	3 843 648 (91.9)
Yes	338 495 (8.1)	340 899 (8.2)
Impaired kidney function		
No	4 180 704 (99.9)	4 179 685 (99.9)
Yes	3843 (0.1)	4 862 (0.1)
Adverse pregnancy		
No	3 935 304 (94.0)	3 931 813 (94.0)
Yes	249 243 (6.0)	252 735 (6.0)
Geographic region		
Southwest	564 097 (13.5)	544 950 (13.0)
North	434 356 (10.4)	533 236 (12.7)
East	1 530 917 (36.6)	1 327 314 (31.7)
Central	573 584 (13.7)	610 892 (14.6)

South	550 629 (13.2)	566 412 (13.5)
Northwest	202 093 (4.8)	282 513 (6.8)
Northeast	328 871 (7.9)	319 230 (7.6)

P values were calculated using Kruskal–Wallis t test for continuous variables and Rao–scott χ^2 test for categorical variables.

Continuous variables were presented with mean±SD and categorical variables with number and proportion.

Abbreviations: NA=not applicable.

Table S3 Crude and standardized prevalence of anaemia of varying severity, overall and by age

	Anaemia	**Mild**	**Moderate**	**Severe**	**Moderate and worse**
	Prevalence (95% CI)	Prevalence (95% CI)	Prevalence (95% CI)	Prevalence (95% CI)	Prevalence (95% CI)
Overall					
Crude	15.8 (15.1–16.5)	9.3 (8.9–9.7)	6.1 (5.8–6.5)	0.44 (0.40–0.47)	6.6 (6.2–7.0)
Weighted	15.8 (15.1–16.6)	9.2 (8.8–9.7)	6.1 (5.8–6.5)	0.44 (0.41–0.48)	6.6 (6.3–7.0)
Age group					
18–24	10.5 (9.8–11.2)	7.1 (6.6–7.6)	3.3 (3.0–3.5)	0.14 (0.12–0.16)	3.4 (3.2–3.6)
25–29	11.3 (10.7–12.0)	7.6 (7.2–8.1)	3.6 (3.3–3.8)	0.15 (0.13–0.17)	3.7 (3.5–3.9)
30–34	14.8 (14.0–15.5)	9.4 (8.9–9.9)	5.1 (4.8–5.4)	0.25 (0.23–0.27)	5.4 (5.1–5.7)
35–39	18.4 (17.6–19.2)	10.6 (10.1–11.2)	7.3 (6.9–7.7)	0.47 (0.43–0.51)	7.8 (7.3–8.2)
40–44	20.0 (19.2–20.8)	10.6 (10.1–11.2)	8.6 (8.2–9.0)	0.72 (0.66–0.77)	9.3 (8.9–9.8)
45–49	18.2 (17.4–18.9)	9.34(8.97–9.70)	8.0 (7.6–8.4)	0.83 (0.77–0.90)	8.9 (8.4–9.3)

Abbreviations: CI=confidential interval.

Table S4 Province–specific prevalence of anaemia among women, China.

Province	Anaemia	Mild	Moderate	Severe	Moderate and worse
Anhui	14.4 (11.3–17.5)	8.2 (6.0–10.4)	5.7 (4.8–6.6)	0.45 (0.32–0.58)	6.2 (5.2–7.2)
Beijing	16.1 (15.9–16.3) †	9.5 (9.4–9.6) †	6.2 (6.1–6.3) †	0.44 (0.40–0.47) †	6.6 (6.5–6.8) †
Chongqing	10.8 (10.6–11.0) †	6.9 (6.8–7.1) †	3.6 (3.5–3.7) †	0.22 (0.19–0.25) †	3.9 (3.8–4.0) †
Fujian	13.8 (12.0–15.6)	8.4 (7.1–9.7)	5.0 (4.5–5.5)	0.41 (0.29–0.53)	5.4 (4.9–5.1)
Gansu	18.9 (16.3–21.5)	9.8 (8.3–11.4)	8.3 (7.4–9.1)	0.81 0.56–1.01)	9.1 (8.1–10.2)
Guangdong	18.0 (16.5–19.4)	10.9 (10.1–11.8)	6.6 (6.1–7.1)	0.42 (0.33–0.50)	7.1 (6.5–7.7)
Guangxi	18.0 (13.3–22.8)	11.7 (8.8–14.6)	6.0 (4.2–7.8)	0.30 (0.24–0.35)	6.4 (4.5–8.2)
Guizhou	9.3 (8.2–10.4)	5.8 (5.0–6.6)	3.3 (2.9–3.7)	0.22 (0.19–0.24)	3.5 (3.2–3.9)
Hainan	15.9 (15.6–16.2) †	9.6 (9.4–9.9) †	5.8 (5.6–6.0) †	0.45 (0.39–0.50) †	6.3 (6.1–6.5) †
Hebei	15.9 (13.9–17.9)	8.2 (7.2–9.3)	7.2 (6.3–8.1)	0.47 (0.37–0.57)	7.7 (6.7–8.7)
Heilongjiang	16.5 (16.1–16.9)	11.1 (10.4–11.9)	5.2 (4.9–5.4)	0.22 (0.21–0.24)	5.4 (5.1–5.7)
Henan	20.0 (18.5–21.5)	11.4 (10.2–12.6)	8.0 (7.4–8.7)	0.62 (0.55–0.69)	8.7 (8.0–9.4)
Hubei	15.9 (13.8–18.0)	9.7 (8.5–11.0)	5.7 (4.9–6.5)	0.42 (0.36–0.47)	6.1 (5.3–7.0)
Hunan	13.2 (10.8–15.6)	8.2 (6.6–9.8)	4.7 (3.9–5.4)	0.35 (0.26–0.44)	5.0 (4.2–5.8)
Inner Mongolia	11.9 (11.2–12.6)	6.1 (5.7–6.4)	5.5 (4.1–6.8)	0.41 (0.34–0.48)	5.9 (5.4–6.3)
Jiangsu	15.7 (12.2–19.2)	8.8 (6.8–10.9)	6.4 (5.0–7.8)	0.45 (0.37–0.57)	6.8 (5.3–8.4)
Jiangxi	19.0 (17.4–20.6)	11.7 (10.5–12.9)	6.7 (6.1–7.4)	0.56 (0.50–0.61)	7.3 (6.6–8.0)
Jilin	16.0 (14.6–17.4)	9.3 (8.0–10.5)	6.3 (5.9–6.7)	0.45 (0.41–0.49)	6.7 (6.4–7.2)
Liaoning	15.1 (13.8–16.3)	8.8 (8.3–9.4)	5.8 (5.1–6.6)	0.42 (0.34–0.50)	6.3 (5.5–7.1)
Ningxia	11.7 (8.4–14.9)	5.6 (3.9–7.3)	5.5 (4.1–6.8)	0.58 (0.41–0.74)	6.1 (4.5–7.6)
Qinghai	14.9 (14.3–15.3) †	6.9 (6.6–7.3) †	6.9 (6.5–7.2) †	1.06 (0.92–1.22) †	7.9 (7.5–8.4) †
Shandong	17.2 (16.0–18.4)	9.4 (8.6–10.1)	7.3 (6.7–7.8)	0.56 (0.48–0.63)	7.9 (7.3–8.5)
Shanghai	15.4 (15.3–15.5) †	9.1 (8.9–9.2) †	5.9 (5.8–6.0) †	0.42 (0.40–0.44) †	6.4 (6.3–6.5) †
Shannxi	19.3 (18.8–19.8)	10.8 (10.1–11.5)	7.9 (7.7–8.0)	0.69 (0.68–0.69)	8.5 (8.4–8.8)
Shanxi	16.7 (12.6–20.8)	8.5 (6.6–10.4)	7.6 (5.6–9.7)	0.59 (0.59–0.63)	8.3 (5.9–10.6)
Sichuan	12.8 (11.5–14.1)	8.1 (7.2–8.9)	4.4 (4.0–4.9)	0.28 (0.23–0.33)	4.7(4.3–5.2)
Tianjin	13.9 (13.6–14.1) †	7.4 (7.2–7.6) †	6.0 (5.8–6.2)	0.44 (0.39–0.49)	6.4 (6.3–6.7)
Xizang	25.1 (24.1–26.3) †	11.7 (11.0–12.6) †	11.0 (10.2–11.7) †	2.48 (2.08–2.87) †	13.4 (12.7–14.5) †
Xinjiang	14.1 (13.9–14.3) †	7.9 (7.7–8.1) †	5.8 (5.6–5.9) †	0.44 (0.40–0.48) †	6.2 (6.1–6.4) †
Yunnan	13.2 (13.0–13.3) †	7.6 (7.5–7.7) †	5.2 (5.1–5.3) †	0.37 (0.35–0.40) †	5.6 (5.5–5.7) †
Zhejiang	15.6 (15.0–16.2)	9.4 (9.0–9.9)	5.8 (5.5–6.1)	0.41 (0.37–0.45)	6.2 (5.9–6.5)

Moderate and worse anaemia includes moderate and severe anaemia.

The prevalence was standardized by age structure according to 2020 national census of the Chinese population.

†Bootstrap estimation was used to estimate confidential intervals because standard error was more than 30% of the prevalence estimate.

Table S5 Province–specific prevalence of anaemia among women aged 18–34 years, China

Province	Anaemia	Mild	Moderate	Severe	Moderate and worse
Anhui	10.9 (7.7–14.2)	7.1 (4.7–9.5)	3.7 (2.9–4.4)	0.20 (0.18–0.23)	3.9 (3.0–4.7)
Beijing	13.1 (12.9–13.3) †	8.6 (8.4–8.8) †	4.3 (4.2–4.4) †	0.21 (0.18–0.23) †	4.5 (4.4–4.6) †
Chongqing	9.0 (8.7–9.3) †	6.3 (6.1–6.5) †	2.6 (2.4–2.7) †	0.11 (0.08–0.13) †	2.7 (2.5–2.8) †
Fujian	10.7 (8.9–12.6)	7.4 (6.1–8.8)	3.1 (2.7–3.6)	0.17 (0.13–0.20)	3.3 (2.8–3.8)
Gansu	15.0 (12.8–17.1)	9.0 (7.5–10.5)	5.6 (4.8–6.3)	0.39 (0.30–0.49)	6.0 (5.2–6.8)
Guangdong	14.6 (13.3–15.9)	10.0 (9.0–10.9)	4.5 (4.1–4.8)	0.15 (0.13–0.16)	4.7 (4.3–5.0)
Guangxi	15.8 (11.1–20.5)	11.2 (8.2–14.1)	4.5 (2.7–6.3)	0.13 (0.10–0.16)	4.7 (4.5–4.8) †
Guizhou	7.3 (6.3–8.3)	5.0 (4.3–5.8)	2.2 (1.9–2.5)	0.08 (0.07–0.09)	2.3 (1.9–2.6)
Hainan	12.2 (11.8–12.5) †	8.1 (7.8–8.4) †	3.9 (3.7–4.1) †	0.14 (0.10–0.18) †	4.1 (3.9–4.3) †
Hebei	12.2 (10.6–13.7)	7.2 (6.3–8.2)	4.7 (4.1–5.4)	0.21 (0.17–0.24)	5.0 (4.3–5.6)
Heilongjiang	12.6 (12.4–12.8)	8.6 (8.5–8.7)	3.9 (3.8–4.1)	0.05 (0.03–0.06)	4.0 (3.8–4.2)
Henan	16.5 (14.8–18.1)	10.8 (9.6–12.0)	5.4 (5.0–5.8)	0.27 (0.22–0.31)	5.7 (5.2–6.1)
Hubei	13.1 (11.5–14.8)	8.9 (7.8–10.0)	4.1 (3.5–4.7)	0.19 (0.16–0.23)	4.3 (3.7–4.9)
Hunan	10.7 (8.7–12.7)	7.3 (5.7–8.8)	3.2 (2.8–3.7)	0.18 (0.13–0.23)	3.4 (2.9–4.0)
Inner Mongolia	8.9 (8.4–9.4) †	5.2 (4.8–5.6) †	3.5 (3.3–3.7) †	0.20 (0.16–0.24) †	3.7 (3.5–3.9) †
Jiangsu	12.4 (9.1–15.7)	7.9 (5.9–9.9)	4.3 (3.1–5.5)	0.20 (0.13–0.26)	4.5 (3.3–5.8)
Jiangxi	15.5 (13.8–17.3)	10.7 (9.3–12.0)	4.7 (4.2–5.2)	0.23 (0.17–0.28)	4.9 (4.4–5.5)
Jilin	13.3 (11.8–14.7)	8.6 (7.4–9.9)	4.4 (4.2–4.7)	0.24 (0.16–0.31)	4.7 (4.4–5.0)
Liaoning	11.7 (10.7–12.7)	7.8 (7.2–8.3)	3.8 (3.3–4.2)	0.18 (0.15–0.22)	4.0 (3.5–4.4)
Ningxia	8.9 (7.5–10.4)	5.0 (3.9–6.1)	3.6 (3.3–4.0)	0.31 (0.26–0.35)	3.9 (3.5–4.3)
Qinghai	11.5 (10.7–12.2) †	6.2 (5.7–6.8) †	4.6 (4.1–5.1) †	0.65 (0.47–0.82) †	5.3 (4.7–5.8) †
Shandong	13.4 (12.3–14.6)	8.4 (7.6–9.3)	4.8 (4.4–5.2)	0.22 (0.19–0.24)	5.0 (4.6–5.4)
Shanghai	12.3 (12.2–12.5) †	8.2 (8.1–8.3) †	4.0 (3.9–4.1) †	0.17 (0.15–0.19) †	4.2 (4.1–4.3) †
Shannxi	15.1 (15.0–15.2)	9.4 (9.2–9.6)	5.4 (5.2–5.7)	0.28 (0.27–0.29)	5.7 (5.5–6.0)
Shanxi	12.4 (9.2–15.6)	7.3 (5.4–9.2)	4.9 (3.6–6.1)	0.21 (0.18–0.25) †	5.1 (3.8–6.4)
Sichuan	10.1 (9.3–10.8)	6.9 (6.3–7.5)	3.0 (2.8–3.2)	0.11 (0.10–0.13)	3.2 (3.0–3.4)
Tianjin	10.4 (10.1–10.7) †	6.2 (6.0–6.5) †	4.0 (3.8–4.2)	0.21 (0.16–0.27)	4.2 (4.0–4.4)
Xizang	25.2 (23.8–26.5) †	12.2 (11.1–13.2) †	10.9 (9.9–11.9) †	2.12 (1.66–2.55) †	13.1 (12.1–14.2) †
Xinjiang	11.7 (11.4–12.0) †	7.3 (7.0–7.5) †	4.2 (4.0–4.4) †	0.23 (0.18–0.27) †	4.5 (4.3–4.6) †
Yunnan	9.7 (9.6–9.9) †	6.4 (6.2–6.5) †	3.3 (3.1–3.4) †	0.12 (0.10–0.14) †	3.4 (3.3–3.5) †
Zhejiang	12.2 (11.7–12.8)	8.2 (7.9–8.6)	3.8 (3.6–4.1)	0.17 (0.15–0.19)	4.0 (3.8–4.3)

Moderate and worse anaemia includes moderate and severe anaemia.

The prevalence was standardized by age structure according to 2020 national census of the Chinese population.

†Bootstrap estimation was used to estimate confidential intervals because standard error was more than 30% of the prevalence estimate.

Table S6 Province–specific prevalence of anaemia among women aged 35–49, China.

Province	Anaemia	Mild	Moderate	Severe	Moderate and worse
Anhui	17.6 (14.9–20.2)	9.3 (7.4–11.2)	7.6 (6.8–8.4)	0.68 (0.56–0.81)	8.3 (7.5–9.2)
Beijing	19.0 (18.7–19.2) †	10.4 (10.2–10.6) †	7.9 (7.7–8.1) †	0.65 (0.59–0.71) †	8.6 (8.4–8.8) †
Chongqing	12.5 (12.2–12.8) †	7.5 (7.3–7.7) †	4.6 (4.5–4.8) †	0.32 (0.27–0.37) †	5.0 (4.8–5.2) †
Fujian	16.7 (14.7–18.7)	9.3 (7.9–10.6)	6.8 (6.2–7.4)	0.64 (0.43–0.84)	7.5 (6.7–8.3)
Gansu	22.6 (19.4–25.8)	10.6 (8.9–12.4)	10.8 (9.8–11.8)	1.20 (0.77–1.63)	12.0 (10.6–13.5)
Guangdong	21.1 (19.8–22.4)	11.8 (11.1–12.6)	8.6 (8.0–9.2)	0.67 (0.56–0.78)	9.3 (8.7–10.0)
Guangxi	20.1 (14.8–25.3)	12.2 (9.3–15.2)	7.4 (5.2–9.6)	0.45 (0.35–0.55)	7.9 (5.6–10.3)
Guizhou	11.2 (9.8–12.6)	6.5 (5.4–7.6)	4.3 (3.9–4.8)	0.34 (0.30–0.39)	4.7 (4.3–5.1)
Hainan	19.4 (19.0–19.9) †	11.1 (10.7–11.4) †	7.6 (7.3–7.9) †	0.73 (0.63–0.83) †	8.4 (8.1–8.7) †
Hebei	19.4 (17.0–21.8)	9.2 (8.1–10.3)	9.5 (8.3–10.7)	0.72 (0.55–0.88)	10.3 (8.9–11.6)
Heilongjiang	20.1 (18.5–21.8)	13.4 (11.6–15.3)	6.3 (6.1–6.5)	0.39 (0.37–0.40)	6.7 (6.5–7.0)
Henan	23.4 (21.6–25.1)	11.9 (10.6–13.2)	10.5 (10.0–11.1)	0.95 (0.84–1.07)	11.6 (10.9–12.2)
Hubei	18.4 (16.3–20.5)	10.6 (9.2–11.9)	7.2 (6.5–7.9)	0.63 (0.56–0.69)	6.9 (7.1–8.6)
Hunan	15.6 (13.4–17.8)	9.1 (7.6–10.6)	6.0 (5.3–6.6)	0.51 (0.43–0.60)	6.5 (5.8–7.3)
Inner Mongolia	14.7 (14.1–15.3)	6.9 (6.6–7.2)	7.3 (6.7–7.8)	0.60 (0.46–0.75)	7.9 (7.4–8.4)
Jiangsu	18.7 (15.0–22.4)	9.8 (7.7–11.8)	8.3 (6.7–9.8)	0.69 (0.53–0.86)	9.0 (7.3–10.7)
Jiangxi	22.2 (20.2–24.2)	12.7 (11.3–14.1)	8.6 (7.8–9.5)	0.86 (0.77–0.96)	9.6 (8.6–10.5)
Jilin	18.5 (16.8–20.3)	9.8 (8.5–11.2)	8.1 (7.5–8.6)	0.64 (0.57–0.72)	8.8 (8.2–9.3)
Liaoning	18.2 (16.9–19.6)	9.8 (9.1–10.5)	7.8 (7.0–8.6)	0.64 (0.54–0.74)	8.5 (7.6–9.4)
Ningxia	14.2 (9.9–18.6)	6.2 (4.1–8.4)	7.2 (5.2–9.1)	0.83 (0.60–1.06)	8.0 (5.8–10.2)
Qinghai	18.0 (17.2–18.8) †	7.6 (7.1–8.1) †	9.0 (8.4–9.5) †	1.45 (1.20–1.69) †	10.5 (9.9–11.1) †
Shandong	20.7 (19.6–21.8)	10.2 (9.6–10.9)	9.6 (9.2–10.1)	0.87 (0.78–0.97)	10.6 (10.1–11.1)
Shanghai	18.3 (18.1–18.5) †	9.9 (9.7–10.0) †	7.8 (7.6–7.9) †	0.66 (0.62–0.69) †	8.5 (8.3–8.6) †
Shannxi	23.2 (22.8–23.7)	12.1 (11.1–13.0)	10.1 (9.7–10.6)	1.07 (1.02–1.12)	11.3 (10.8–11.8)
Shanxi	20.7 (19.6–21.8)	9.6 (7.8–11.3)	10.2 (7.8–12.7)	0.94 (0.88–1.01) †	11.2 (8.4–14.1)
Sichuan	15.4 (14.2–16.5)	9.2 (8.3–10.0)	5.7 (5.4–6.1)	0.44 (0.39–0.48)	6.2 (5.8–6.6)
Tianjin	17.1 (16.6–17.5) †	8.6 (8.2–8.9) †	7.9 (7.6–8.2) †	0.66 (0.56–0.75) †	8.6 (8.3–8.9) †
Xizang	25.1 (23.4–26.7) †	11.2 (10.0–12.5) †	11.0 (9.8–12.2) †	2.81 (2.14–3.48) †	14.0 (12.6–15.3) †
Xinjiang	16.3 (16.0–16.6) †	8.5 (8.2–8.7) †	7.2 (5.1–9.3) †	0.65 (0.58–0.72) †	7.9 (7.6–8.1) †
Yunnan	16.3 (16.1–16.5) †	8.8 (8.6–8.9) †	7.0 (6.8–7.1) †	0.61 (0.56–0.65) †	7.6 (7.5–7.8) †
Zhejiang	18.7 (17.7–19.8)	10.6 (9.9–11.2)	7.5 (7.0–8.1)	0.63 (0.56–0.71)	8.2 (7.6–8.9)

Moderate and worse anaemia includes moderate and severe anaemia.

The prevalence was standardized by age structure according to 2020 national census of the Chinese population.

†Bootstrap estimation was used to estimate confidential intervals because standard error was more than 30% of the prevalence estimate.

Table S7 Geographic difference in anaemia prevalence among women, China.

	Prevalence	Age – adjusted OR (95%CI) *	*P* value	Full – adjusted OR (95%CI) †	*P* value
Anaemia					
Southwest China	11.9 (10.3–13.5)	Reference		Reference	
North China	15.3 (14.2–16.5)	1.35 (1.13–1.60)	0.0007	1.36 (1.15–1.61)	0.0004
East China	16.0 (15.0–17.1)	1.41 (1.20–1.67)	< 0.0001	1.43 (1.21–1.67)	< 0.0001
Central China	16.9 (14.9–18.8)	1.50 (1.23–1.84)	< 0.0001	1.49 (1.22–1.82)	< 0.0001
South China	17.6 (16.1–19.1)	1.62 (1.36–1.94)	< 0.0001	1.67 (1.40–2.00)	< 0.0001
Northwest China	17.0 (14.4–19.6)	1.53 (1.20–1.94)	0.0005	1.47 (1.17–1.84)	0.0010
Northeast China	16.1 (15.1–17.2)	1.39 (1.18–1.63)	< 0.0001	1.43 (1.23–1.68)	< 0.0001
Mild					
Southwest China	7.3 (6.5–8.2)	Reference		Reference	
North China	8.1 (7.4–8.9)	1.12 (0.96–1.31)	0.16	1.14 (0.98–1.33)	0.09
East China	9.3 (8.6–9.9)	1.29 (1.11–1.49)	0.0006	1.30 (1.13–1.49)	0.0002
Central China	10.0 (8.9–11.2)	1.40 (1.18–1.68)	0.0002	1.40 (1.17–1.67)	0.0002
South China	11.0 (10.0–12.0)	1.57 (1.34–1.84)	< 0.0001	1.60 (1.36–1.87)	< 0.0001
Northwest China	9.2 (7.6–10.8)	1.29 (1.03–1.61)	0.0294	1.26 (1.01–1.56)	0.0371
Northeast China	9.8 (8.6–11.0)	1.35 (1.13–1.62)	0.0010	1.40 (1.18–1.65)	< 0.0001
Moderate					
Southwest China	4.3 (3.6–5.0)	Reference		Reference	
North China	6.7 (6.1–7.3)	1.63 (1.35–1.98)	< 0.0001	1.62 (1.34–1.96)	< 0.0001
East China	6.3 (5.9–6.8)	1.51 (1.26–1.81)	< 0.0001	1.51 (1.26–1.81)	< 0.0001
Central China	6.4 (5.6–7.2)	1.53 (1.24–1.89)	< 0.0001	1.50 (1.22–1.85)	0.0001
South China	6.3 (5.7–6.8)	1.55 (1.28–1.89)	< 0.0001	1.61 (1.33–1.95)	< 0.0001
Northwest China	7.1 (6.2–8.1)	1.74 (1.39–2.19)	< 0.0001	1.65 (1.32–2.05)	< 0.0001
Northeast China	6.0 (5.4–6.5)	1.37 (1.13–1.66)	0.0014	1.40 (1.16–1.69)	0.0005
Severe					
Southwest China	0.3 (0.2–0.4)	Reference		Reference	
North China	0.5 (0.4–0.5)	1.62 (1.25–2.11)	0.0003	1.57 (1.21–2.05)	0.0008
East China	0.5 (0.4–0.5)	1.61 (1.25–2.06)	0.0002	1.61 (1.25–2.07)	0.0002
Central China	0.5 (0.4–0.6)	1.63 (1.24–2.15)	0.0005	1.59 (1.21–2.09)	0.0009
South China	0.4 (0.3–0.4)	1.31 (1.24–2.15)	0.0444	1.39 (1.05–1.84)	0.0216
Northwest China	0.7 (0.5–0.8)	2.27 (1.67–3.09)	< 0.0001	2.04 (1.49–2.79)	< 0.0001
Northeast China	0.4 (0.3–0.5)	1.24 (0.90–1.71)	0.20	1.27 (0.92–1.76)	0.15
Moderate and worse					
Southwest China	4.6 (3.8–5.3)	Reference		Reference	
North China	7.2 (6.5–7.9)	1.64 (1.35–1.99)	< 0.0001	1.62 (1.34–1.97)	< 0.0001
East China	6.8 (6.3–7.3)	1.52 (1.26–1.83)	< 0.0001	1.53 (1.27–1.83)	< 0.0001
Central China	6.9 (6.0–7.8)	1.55 (1.24–1.92)	< 0.0001	1.52 (1.23–1.88)	0.0001
South China	6.6 (6.1–7.2)	1.55 (1.27–1.88)	< 0.0001	1.61 (1.32–1.95)	< 0.0001
Northwest China	7.8 (6.7–8.9)	1.80 (1.42–2.26)	< 0.0001	1.69 (1.35–2.11)	< 0.0001
Northeast China	6.4 (5.7–7.0)	1.36 (1.12–1.66)	0.002	1.40 (1.15–1.70)	0.0009

*Logistic model adjusted for only age. †Logistic models adjusted for age (per 5 years), BMI, hypertension, diabetes, high total cholesterol, high triglyceride, hyperuricemia, impaired kidney function, and history of cesarean delivery, city–level per capita GDP, province–level unemployment, and province–level education.

Table S8 Geographic difference in anaemia prevalence among women aged 18–34, China.

	Prevalence	Age – adjusted OR (95%CI) *	*P* value	Full – adjusted OR (95%CI) †	*P* value
Anaemia					
Southwest China	9.3 (7.9–10.6)	Reference		Reference	
North China	11.8 (10.8–12.9)	1.27 (1.06–1.54)	0.0107	1.29 (1.08–1.55)	0.0059
East China	12.6 (11.6–13.7)	1.37 (1.14–1.65)	0.0007	1.40 (1.17–1.67)	0.0003
Central China	14.0 (12.1–16.0)	1.55 (1.24–1.94)	0.0002	1.55 (1.24–1.93)	0.0001
South China	14.6 (13.1–16.1)	1.65 (1.36–2.01)	< 0.0001	1.71 (1.41–2.07)	< 0.0001
Northwest China	13.5 (11.3–15.8)	1.50 (1.17–1.93)	0.0013	1.47 (1.16–1.86)	0.0016
Northeast China	12.4 (11.5–13.3)	1.35 (1.13–1.61)	0.0010	1.41 (1.19–1.68)	< 0.0001
Mild					
Southwest China	6.3 (5.5–7.1)	Reference		Reference	
North China	7.2 (6.4–8.0)	1.12 (0.94–1.34)	0.21	1.14 (0.86–1.35)	0.14
East China	8.2 (7.5–8.9)	1.31 (1.11–1.54)	0.0012	1.32 (1.13–1.55)	0.0004
Central China	9.3 (8.0–10.7)	1.50 (1.22–1.84)	0.0001	1.50 (1.22–1.83)	< 0.0001
South China	10.1 (9.0–11.1)	1.65 (1.39–1.97)	< 0.0001	1.69 (1.52–2.01)	< 0.0001
Northwest China	8.3 (6.7–9.8)	1.32 (1.04–1.68)	0.02	1.30 (1.03–1.63)	0.0246
Northeast China	8.3 (7.7–8.8)	1.31 (1.12–1.53)	0.0006	1.37 (1.18–1.59)	< 0.0001
Moderate					
Southwest China	2.9 (2.3–3.4)	Reference		Reference	
North China	4.5 (4.1–4.9)	1.53 (1.24–1.90)	< 0.0001	1.55 (1.25–1.91)	< 0.0001
East China	4.2 (3.8–4.6)	1.43 (1.15–1.78)	0.0011	1.46 (1.18–1.80)	0.0006
Central China	4.5 (3.8–5.1)	1.53 (1.20–1.96)	0.0006	1.52 (1.20–1.94)	0.0007
South China	4.4 (4.0–4.9)	1.54 (1.24–1.93)	0.0001	1.61 (1.29–2.00)	< 0.0001
Northwest China	5.0 (4.2–5.7)	1.73 (1.3502.23)	<0.0001	1.68 (1.31–2.14)	< 0.0001
Northeast China	5.0 (3.7–4.3)	1.37 (1.10–1.69)	0.004	1.43 (1.16–1.76)	0.0009
Severe					
Southwest China	0.1 (0.1–0.2)	Reference		Reference	
North China	0.2 (0.2–0.3)	1.59 (1.03–2.44)	0.04	1.60 (1.03–2.47)	0.04
East China	0.2 (0.2–0.3)	1.50 (0.97–2.30)	0.07	1.55 (1.00–2.40)	0.04
Central China	0.2 (0.1–0.3)	1.69 (1.07–2.65)	0.02	1.67 (1.06–2.63)	0.03
South China	0.1 (0.1–0.2)	1.09 (0.71–1.66)	0.70	1.15 (0.75–1.76)	0.52
Northwest China	0.3 (0.2–0.4)	2.40 (1.48–3.89)	0.0004	2.27 (1.40–3.69)	0.0009
Northeast China	0.2 (0.1–0.2)	1.17 (0.62–2.21)	0.62	1.26 (0.67–2.36)	0.48
Moderate and worse					
Southwest China	3.0 (2.4–3.6)	Reference		Reference	
North China	4.7 (4.3–5.1)	1.54 (1.24–1.92)	0.0001	1.55 (1.25–1.93)	< 0.0001
East China	4.4 (3.9–4.8)	1.44 (1.15–1.79)	0.0013	1.46 (1.18–1.82)	0.0007
Central China	4.7 (4.0–5.4)	1.55 (1.20–1.99)	0.0007	1.53 (1.20–1.97)	0.0007
South China	4.6 (4.1–5.0)	1.53 (1.22–1.92)	0.0002	1.59 (1.27–1.99)	< 0.0001
Northwest China	5.3 (4.5–6.1)	1.77 (1.37–2.28)	< 0.0001	1.71 (1.34–2.19)	< 0.0001
Northeast China	4.2 (3.8–4.5)	1.36 (1.09–1.70)	0.007	1.42 (1.14–1.77)	0.002

*Logistic model adjusted for only age. †Logistic models adjusted for age (per 5 years), BMI, hypertension, diabetes, high total cholesterol, high triglyceride, hyperuricemia, impaired kidney function, and history of cesarean delivery, city–level per capita GDP, province–level unemployment, and province–level education.

Table S9 Geographic difference in anaemia prevalence among women aged 35–49, China.

	Prevalence	Age – adjusted OR (95%CI) *	*P* value	Full – adjusted OR (95%CI) †	*P* value
Anaemia					
Southwest China	14.4 (12.6–16.2)	Reference		Reference	
North China	18.6 (17.2–19.9)	1.35 (1.14–1.61)	0.0005	1.37 (1.15–1.62)	0.0003
East China	19.2 (18.1–20.2)	1.41 (1.20–1.65)	< 0.0001	1.41 (1.21–1.65)	< 0.0001
Central China	19.5 (17.5–21.5)	1.44 (1.19–1.75)	0.0002	1.43 (1.18–1.73)	0.0002
South China	20.7 (19.1–22.3)	1.55 (1.31–1.85)	< 0.0001	1.61 (1.35–1.91)	< 0.0001
Northwest China	20.4 (17.3–23.5)	1.52 (1.20–1.93)	0.0005	1.45 (1.16–1.82)	0.0014
Northeast China	18.9 (17.6–20.2)	1.38 (1.17–1.63)	0.0001	1.42 (1.21–1.66)	< 0.0001
Mild					
Southwest China	8.3 (7.4–9.2)	Reference		Reference	
North China	9.0 (8.3–9.8)	1.08 (0.93–1.26)	0.30	1.11 (0.96–1.29)	0.17
East China	10.2 (9.6–10.8)	1.24 (1.08–1.42)	0.0021	1.25 (1.09–1.43)	0.0010
Central China	10.6 (9.6–11.7)	1.30 (1.11–1.53)	0.0014	1.30 (1.11–1.53)	0.0014
South China	11.9 (11.0–12.9)	1.47 (1.27–1.71)	< 0.0001	1.49 (1.29–1.73)	< 0.0001
Northwest China	10.1 (8.4–11.9)	1.24 (0.99–1.54)	0.06	1.21 (0.98–1.49)	0.08
Northeast China	10.9 (9.1–12.7)	1.35 (1.08–1.67)	0.008	1.37 (1.13–1.67)	0.0013
Moderate					
Southwest China	5.6 (4.8–6.5)	Reference		Reference	
North China	8.8 (8.0–9.6)	1.64 (1.36–1.98)	< 0.0001	1.61 (1.34–1.94)	< 0.0001
East China	8.2 (7.8–8.7)	1.52 (1.28–1.80)	< 0.0001	1.51 (1.28–1.79)	< 0.0001
Central China	8.2 (7.2–9.1)	1.50 (1.23–1.84)	< 0.0001	1.47 (1.21–1.80)	0.0001
South China	8.2 (7.5–8.9)	1.52 (1.26–1.83)	< 0.0001	1.58 (1.31–1.90)	< 0.0001
Northwest China	9.3 (8.0–10.5)	1.72 (1.38–2.14)	< 0.0001	1.61 (1.30–1.99)	< 0.0001
Northeast China	7.4 (6.6–8.1)	1.35 (1.11–1.63)	0.0025	1.36 (1.13–1.65)	0.0013
Severe					
Southwest China	0.5 (0.4–0.6)	Reference		Reference	
North China	0.7 (0.6–0.8)	1.61 (1.26–2.05)	0.0001	1.56 (1.22–1.98)	0.0004
East China	0.7 (0.7–0.8)	1.62 (1.30–2.02)	< 0.0001	1.62 (1.30–2.01)	< 0.0001
Central China	0.7 (0.6–0.8)	1.61 (1.26–2.06)	0.0002	1.57 (1.22–2.01)	0.0004
South China	0.6 (0.5–0.7)	1.35 (1.07–1.72)	0.01	1.45 (1.11–1.88)	0.006
Northwest China	1.0 (0.8–1.2)	2.22 (1.66–1.72)	< 0.0001	1.97 (1.48–2.63)	< 0.0001
Northeast China	0.6 (0.5–0.7)	1.24 (0.95–1.64)	0.12	1.27 (0.97–1.68)	0.09
Moderate and worse					
Southwest China	6.1 (5.2–7.1)	Reference		Reference	
North China	9.6 (8.7–10.5)	1.65 (1.36–1.99)	< 0.0001	1.62 (1.34–1.96)	< 0.0001
East China	9.0 (8.5–9.6)	1.54 (1.29–1.83)	< 0.0001	1.53 (1.29–1.82)	< 0.0001
Central China	9.0 (7.9–10.0)	1.52 (1.24–1.87)	< 0.0001	1.49 (1.22–1.83)	0.0001
South China	8.9 (8.1–9.6)	1.51 (1.25–1.83)	< 0.0001	1.58 (1.31–1.91)	< 0.0001
Northwest China	10.3 (8.8–11.8)	1.78 (1.42–2.23)	< 0.0001	1.66 (1.33–2.06)	< 0.0001
Northeast China	8.0 (7.2–8.9)	1.34 (1.10–1.64)	0.004	1.36 (1.12–1.66)	0.002

*Logistic model adjusted for only age. †Logistic models adjusted for age (per 5 years), BMI, hypertension, diabetes, high total cholesterol, high triglyceride, hyperuricemia, impaired kidney function, and history of cesarean delivery, city–level per capita GDP, province–level unemployment, and province–level education.

Table S10 Multivariate–adjusted odds ratio for mild, moderate, and severe anaemia among women of reproductive age in China.

Independent variables	Mild		Moderate		Severe	
	OR (95% CI)	*P* value	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Age (per 5 years)	1.13 (1.12–1.14)	< 0.0001	1.29 (1.28–1.30)	< 0.0001	1.62 (1.59–1.65)	< 0.0001
Body mass index						
Underweight	1.02 (1.00–1.04)	0.018	0.93 (0.91–0.95)	< 0.0001	0.79 (0.73–0.85)	< 0.0001
Normal	Reference		Reference		Reference	
Overweight	0.86 (0.85–0.88)	< 0.0001	1.01 (0.99–1.03)	0.274	1.16 (1.11–1.21)	< 0.0001
Obesity	0.82 (0.78–0.86)	< 0.0001	1.03 (0.99–1.05)	0.286	1.30 (1.21–1.40)	< 0.0001
Hypertension						
No	Reference		Reference		Reference	
Yes	0.83 (0.81–0.86)	< 0.0001	0.97 (0.95–0.99)	0.01	0.78 (0.73–0.83)	< 0.0001
Diabetes						
No	Reference		Reference		Reference	
Yes	0.70 (0.66–0.74)	< 0.0001	0.80 (0.77–0.84)	< 0.0001	1.05 (0.91–1.20)	0.54
High total cholesterol						
No	Reference		Reference		Reference	
Yes	0.68 (0.66–0.70)	< 0.0001	0.50 (0.49–0.52)	< 0.0001	0.14 (0.13–0.16)	< 0.0001
High triglyceride						
No	Reference		Reference		Reference	
Yes	0.81 (0.76–0.86)	< 0.0001	0.76 (0.74–0.78)	< 0.0001	0.63 (0.59–0.67)	< 0.0001
Hyperuricemia						
No	Reference		Reference		Reference	
Yes	0.70 (0.67–0.72)	< 0.0001	0.51 (0.49–0.54)	< 0.0001	0.42 (0.38–0.46)	< 0.0001
Impaired kidney function						
No	Reference		Reference		Reference	
Yes	2.56 (1.59–4.13)	0.0001	1.90 (0.97–3.69)	0.06	2.87 (1.35–6.11)	0.006
History of cesarean delivery						
No	Reference		Reference		Reference	
Yes	1.15 (1.08–1.23)	< 0.0001	1.17 (1.10–1.25)	< 0.0001	1.18 (1.06–1.31)	0.002

OR = odd ratio. CI = confidential interval.

Table S11 The association between anaemia of varying severity and diabetes.

	Cases	Prevalence (95%CI)	P value for prevalence	Odd ratio (95%CI)	P value
Overall anaemia			< 0.0001		
Normal	656 117	15.9 (15.1–16.6)		Reference	
Normal with low FBG	18	21.1 (11.3–30.8)		1.55 (0.86–2.80)	0.14
Only diabetes	4771	11.0 (10.4–11.6)		0.80 (0.76–0.84)	< 0.0001
Diabetes in treatment or diabetic nephropathy	1200	15.0 (13.9–16.1)		1.07 (0.99–1.16)	0.07
Mild anaemia			< 0.0001		
Normal	384 361	9.3 (8.8–9.7)		Reference	
Normal with low FBG	9	9.1 (2.7–15.6)		1.11 (0.52–2.37)	0.65
Only diabetes	2338	5.4 (5.1–5.8)		0.71 (0.66–0.76)	< 0.0001
Diabetes in treatment or diabetic nephropathy	637	7.9 (7.2–8.7)		1.02 (0.92–1.14)	0.80
Moderate anaemia			< 0.0001		
Normal	253 692	6.1 (5.8–6.5)		Reference	
Normal with low FBG	9	12.0 (3.9–20.0)		2.36 (1.05–5.28)	0.04
Only diabetes	2213	5.1 (4.8–5.4)		0.89 (0.85–0.93)	< 0.0001
Diabetes in treatment or diabetic nephropathy	517	6.5 (5.9–7.1)		1.12 (1.05–5.28)	0.03
Severe anaemia			0.0280		
Normal	18 064	0.4 (0.4–0.5)		Reference	
Normal with low FBG	0	..		..	..
Only diabetes	220	0.5 (0.4–0.6)		1.37 (1.17–1.60)	< 0.0001
Diabetes in treatment or diabetic nephropathy	46	0.6 (0.4–0.8)		1.43 (1.04–1.97)	0.03
Moderate and worse anaemia			< 0.0001		
Normal	271 756	6.6 (6.2–6.9)		Reference	
Normal with low FBG	9	12.0 (3.9–20.0)		2.21 (0.98–4.97)	0.0005
Only diabetes	2433	5.6 (5.3–6.0)		0.92 (0.87–0.96)	0.0071
Diabetes in treatment or diabetic nephropathy	7335	7.1 (6.5–7.7)		1.14 (1.04–1.25)	0.0552

OR=odd ratio. CI=confidential interval.

Table S12 Sensitivity analysis of multivariable logistic models.

Independent variables	Anaemia		Mild		Moderate		Severe		Moderate and worse	
	OR (95% CI)	*P* value	OR (95% CI)	*P* value	OR (95% CI)	*P* value	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Age (per 5 years)	1.21 (1.20–1.21)	< 0.0001	1.13 (1.12–1.14)	< 0.0001	1.30 (1.29–1.31)	< 0.0001	1.66 (1.64–1.69)	< 0.0001	1.32 (1.31–1.33)	< 0.0001
Body mass index										
Underweight	0.99 (0.97–1.00)	0.13	1.03 (1.01–1.04)	0.005	0.92 (0.90–0.95)	< 0.0001	0.78 (0.71–0.85)	< 0.0001	0.92 (0.90–0.94)	< 0.0001
Normal	Reference		Reference		Reference		Reference		Reference	
Overweight	0.93 (0.92–0.95)	< 0.0001	0.87 (0.86–0.88)	< 0.0001	1.01 (0.99–1.03)	0.13	1.16 (1.11–1.21)	< 0.0001	1.02 (1.01–1.04)	0.01
Obesity	0.92 (0.89–0.94)	< 0.0001	0.83 (0.80–0.85)	< 0.0001	1.03 (0.99–1.07)	0.10	1.30 (1.22–1.39)	< 0.0001	1.05 (1.01–1.08)	0.006
Hypertension										
No	Reference		Reference		Reference		Reference		Reference	
Yes	0.90 (0.88–0.91)	< 0.0001	0.84 (0.82–0.86)	< 0.0001	0.97 (0.95–0.99)	0.02	0.78 (0.73–0.83)	<0.0001	0.96 (0.94–0.98)	0.0002
Diabetes										
No	Reference		Reference		Reference		Reference		Reference	
Yes	0.77 (0.75–0.80)	< 0.0001	0.72 (0.69–0.75)	< 0.0001	0.82 (0.78–0.85)	< 0.0001	1.02 (0.90–1.16)	0.73	0.83 (0.80–0.86)	< 0.0001
High total cholesterol										
No	Reference		Reference		Reference		Reference		Reference	
Yes	0.59 (0.58–0.61)	< 0.0001	0.69 (0.67–0.70)	< 0.0001	0.51 (0.49–0.52)	< 0.0001	0.14 (0.13–0.15)	< 0.0001	0.48 (0.47–0.49)	< 0.0001
High triglyceride										
No	Reference		Reference		Reference		Reference		Reference	
Yes	0.78 (0.76–0.80)	< 0.0001	0.80 (0.77–0.82)	< 0.0001	0.76 (0.74–0.78)	< 0.0001	0.64 (0.60–0.68)	< 0.0001	0.75 (0.73–0.77)	< 0.0001
Hyperuricemia										
No	Reference		Reference		Reference		Reference		Reference	
Yes	0.61 (0.59–0.64)	< 0.0001	0.69 (0.67–0.72)	< 0.0001	0.50 (0.47–0.53)	< 0.0001	0.41 (0.37–0.44)	< 0.0001	0.49 (0.47–0.52)	< 0.0001
Impaired kidney function										
No	Reference		Reference		Reference		Reference		Reference	

Yes	2.38 (1.48–3.84)	0.0003	2.07 (1.22–3.51)	0.007	2.54 (1.60–4.04)	< 0.0001	4.31 (2.59–7.18)	< 0.0001	2.71 (1.69–4.36)	< 0.0001
History of cesarean delivery										
No	Reference		Reference		Reference		Reference		Reference	
Yes	1.17 (1.10–1.24)	< 0.0001	1.17 (1.09–1.25)	< 0.0001	1.18 (1.11–1.25)	< 0.0001	1.20 (1.09–1.32)	0.0002	1.18 (1.11–1.25)	< 0.0001

Models were performed among 3 722 106 participants with no missing values.

We fitted multivariable logistic regression with cluster effect of city and included age (per 5 years), BMI, hypertension, diabetes, high total cholesterol, high triglyceride, hyperuricemia, impaired kidney function, and adverse pregnancy as explanatory variables, adjusting for city–level per capita GDP, province–level unemployment, and province–level education.