

Supplementary Table S1. Basic information of pregnant women in seven provinces

Indication	Classification	Number	Proportion (%)
Habitation	Village	1,518	63.3
	Urban	879	36.7
Gestation	First trimester	428	17.6
	Middle trimester	1,102	45.2
	Last trimester	907	37.2
Level of education	Primary school	114	4.8
	Junior high school	850	35.5
	Senior high school	534	22.3
	Junior college	564	23.5
	Bachelor degree	314	13.1
	Master degree or above	21	0.8
Household annual income, yuan a year	< 20,000	349	14.6
	20,000–29,999	403	16.8
	30,000–59,999	685	28.6
	60,000–100,000	651	27.2
	> 100,000	309	12.8
Pregnancy vomiting reaction	No	600	25.0
	Slight	1,171	48.9
	Moderate	420	17.5
	Serious	206	8.6
Dietary habit	Three meals a day	1,537	64.1
	Four meals a day	300	12.5
	Five or six meals a day	395	16.5
	Rule-less	165	6.9
Total		2,397	100.0

Supplementary Table S2. Comparison of thyroid diseases prevalence grouped by counties and individual with different MUIC¹ or UI²

Kind of disease	Rate (%) grouped by median urinary iodine (counties, µg/L)		P ³	Rate (%) grouped by urinary iodine (individual, µg/L)			P ³
	100–149	150–249		< 150	150–249	250–499	
	Hypothyroidism	0.46		0.50	0.888	0.27	
Sub-hypothyroidism	2.46	5.38	0.000	2.67	5.24	3.72	0.014
Hyperthyroidism	1.55	1.65	0.842	1.42	1.50	2.94	0.078
Sub-hyperthyroidism	1.55	1.82	0.616	1.96	1.62	2.94	0.351
TPOAb positive	8.95	13.78	0.004	11.39	11.66	16.38	0.011
TgAb positive	6.19	6.69	0.623	6.35	6.13	7.71	0.489
Double antibody positive	3.78	5.48	0.034	4.41	3.44	5.39	0.188
Goiter	1.02	0.41	0.027	1.10	0.50	4.90	0.000
Nodules	16.44	17.15	0.646	17.10	15.30	14.40	0.321

Note. ¹MUIC, population median urinary iodine concentration. ²UI, personal urinary iodine concentration. ³Chi-square test and Fisher's exact test.

Supplementary Table S3. Prevalence of thyroid diseases for pregnant women in different provinces

Provinces	Number	Prevalence of thyroid function related diseases (%)							Total	Goiter ¹ rate (%)	Thyroid nodule ² rate (%)
		Hypo-thyroidism ³	Subclinical hypo-thyroidism ⁴	Hyper-thyroidism ⁵	Subclinical hyper-thyroidism ⁶	TPOAb positive ⁷	TgAb positive ⁸	Double antibody positive ⁹			
Xinjiang	365	1.65	3.56	0.82	0.82	10.96	5.21	1.10	22.47	0.00	8.22
Sichuan	359	0.56	7.24	1.95	1.39	25.63	7.24	5.57	33.98	0.25	10.07
Shanxi	394	0.76	4.31	0.51	2.54	10.15	9.14	6.09	17.01	0.46	22.74
Liaoning	367	0.27	3.27	4.36	0.27	10.35	8.99	4.63	17.71	3.25	20.80
Fujian	318	0.31	1.26	2.52	3.46	7.55	3.14	2.20	15.09	0.52	14.25
Anhui	401	0.50	2.74	0.75	3.24	11.22	6.23	4.49	15.96	0.00	16.67
Hubei	321	0.31	3.74	0.62	1.25	10.28	4.98	4.98	15.89	0.50	16.54
Total	2,525	0.67	3.76	1.62	1.86	12.36	6.53	4.20	19.76	0.72	15.75

Note. ¹Goiter, thyroid volume is beyond the upper limit of the normal range. ²Thyroid nodule, pathological changes caused by local abnormal growth of thyroid cells. ³Hypothyroidism, TSH is greater than the upper limit of the normal range, and FT₄ is less than the lower limit of the normal range. ⁴Subclinical hypothyroidism, TSH is greater than the upper limit of the normal range, and FT₄ is within the normal range. ⁵Hyperthyroidism, TSH is less than the lower limit of the normal range, and FT₄ is greater than the upper limit of the normal range. ⁶Subclinical hyperthyroidism, TSH is less than the lower limit of the normal range, and FT₄ is within the normal range. ⁷TPOAb positive, TPOAb is greater than the upper limit of the normal range. ⁸TgAb positive, TgAb is greater than the upper limit of the normal range. ⁹Double Antibody positive, both TPOAb and TgAb are greater than the upper limit of the normal rang.

Supplementary Table S4. Factors affecting pregnant women's urinary iodine

Classification	Normal group ¹ and low group ²						Normal group and high group ³					
	β	SE	Wald χ^2	OR	95% CI	P^4	β	SE	Wald χ^2	OR	95% CI	P^4
Age												
30–40 years old	0.006	0.091	0.004	1.006	0.842, 1.201	0.952	0.020	0.111	0.032	1.020	0.821, 1.268	0.858
Gestation												
Middle trimester	0.095	0.137	0.482	0.905	0.705, 1.162	0.434	0.043	0.159	0.073	1.000	0.743, 1.347	0.999
Last trimester	0.095	0.148	0.412	0.893	0.680, 1.171	0.412	-0.113	0.170	0.439	0.862	0.621, 1.195	0.372
Habitation												
Urban	0.494	0.106	21.679	0.704	0.575, 0.862	0.001	-0.041	0.129	0.104	1.186	0.915, 1.536	0.198
Annual income, Yuan												
20,000–29,999	0.218	0.191	1.302	1.145	0.793, 1.653	0.469	-0.356	0.230	2.394	0.997	0.639, 1.555	0.988
30,000–59,999	-0.089	0.280	0.100	1.749	1.016, 3.013	0.044	-0.173	0.343	0.255	0.859	0.441, 1.671	0.654
60,000–100,000	0.267	0.303	0.778	1.342	0.748, 2.407	0.325	0.048	0.377	0.016	1.268	0.614, 2.620	0.521
> 100,000	0.509	0.424	1.441	1.449	0.646, 3.248	0.368	-0.452	0.577	0.614	1.515	0.501, 4.584	0.462
Pregnancy vomiting reaction												
Slight	0.055	0.234	0.055	0.678	0.427, 1.076	0.099	0.086	0.298	0.083	1.137	0.637, 2.030	0.663
Moderate	0.006	0.456	0.000	0.534	0.224, 1.277	0.159	0.242	0.610	0.158	0.984	0.311, 3.117	0.978
Serious	-0.578	0.728	0.630	0.695	0.180, 2.692	0.599	0.505	0.988	0.262	0.652	0.101, 4.193	0.653
Dietary habit												
Four meals a day	-0.470	0.189	6.207	2.207	1.514, 3.217	0.000	-0.659	0.236	7.832	0.565	0.352, 0.908	0.018
Five or six meals a day	-0.322	0.406	0.629	1.807	0.844, 3.869	0.128	-0.400	0.545	0.538	0.870	0.315, 2.403	0.788
Rule-less	0.341	0.560	0.369	0.884	0.310, 2.522	0.818	-0.150	0.187	0.637	0.750	0.191, 2.942	0.680

Note. ¹Normal group, urinary iodine concentration is within the range of 150–249 $\mu\text{g/L}$. ²Low group, urinary iodine concentration is less than the 150 $\mu\text{g/L}$. ³High group, urinary iodine concentration is greater than the 249 $\mu\text{g/L}$. ⁴Multivariate Binary logistic regression.

Supplementary Table S5. Factors affecting pregnant women's thyroid function

Indicator	Classification	Normal group and low group ¹						Normal group and high group ¹						
		β	SE	Wald χ^2	OR	95% CI	P ²	β	SE	Wald χ^2	OR	95% CI	P ²	
FT ₄	Age													
	30–40 years old	-0.137	0.210	0.427	0.872	0.577, 1.316	0.513	0.053	0.138	0.148	1.055	0.804, 1.383	0.700	
	Gestation													
	Middle trimester	-2.219	0.278	63.644	0.120	0.075, 0.193	0.000	-0.102	0.330	0.096	1.154	0.622, 2.143	0.649	
	Last trimester	-2.056	0.330	38.854	0.151	0.081, 0.281	0.000	2.470	0.307	64.679	14.683	8.201, 26.288	0.000	
	Habitation													
	Urban	0.174	0.236	2.542	1.715	1.101, 2.670	0.017	0.322	0.156	4.260	1.049	0.766, 1.436	0.766	
	Annual income, Yuan													
	20,000–29,999	-0.338	0.408	0.683	0.810	0.395, 1.662	0.566	-0.032	0.295	0.012	1.046	0.563, 1.943	0.888	
	30,000–59,999	0.514	0.866	0.352	2.948	0.590, 14.724	0.188	0.703	0.495	2.015	3.361	1.258, 8.981	0.016	
	60,000–100,000	-0.100	0.891	0.012	2.485	0.461, 13.388	0.289	1.825	0.537	11.547	8.097	2.820, 23.248	0.000	
	> 100,000	-2.070	1.281	2.611	0.334	0.024, 4.699	0.417	2.310	0.663	12.132	7.212	1.997, 26.045	0.003	
	Pregnancy vomiting reaction													
	Slight	-1.041	0.819	1.616	0.191	0.042, 0.875	0.033	-1.300	0.425	9.367	0.270	0.118, 0.621	0.002	
	Moderate	1.865	1.158	2.591	1.994	0.199, 19.949	0.557	-2.707	0.863	9.835	0.087	0.016, 0.464	0.004	
	Serious	-7.750	1.017	0.986	41.291	0.752, 66.017	0.069	-5.462	1.442	14.339	0.012	0.001, 0.132	0.000	
	Dietary habit													
Four meals a day	-1.022	0.479	4.554	0.759	0.329, 1.747	0.516	0.388	0.314	1.530	1.642	0.884, 3.051	0.117		
Five or six meals a day	-2.074	0.967	4.601	0.187	0.028, 1.248	0.083	0.542	0.759	0.510	1.563	0.359, 6.809	0.552		
Rule-less	-9.373	1.227	0.823	36.800	0.109, 52.238	0.995	3.526	1.285	7.528	17.754	2.197, 143.491	0.007		
TSH	Age													
	30–40 years old	0.030	0.202	0.022	1.031	0.694, 1.531	0.881	0.203	0.247	0.676	1.225	0.755, 1.986	0.411	
	Gestation													
	Middle trimester	0.100	0.347	0.083	1.485	0.785, 2.810	0.224	0.283	0.523	0.292	1.059	0.429, 2.611	0.901	
	Last trimester	1.352	0.346	15.245	5.216	2.739, 9.933	0.000	1.487	0.502	8.788	4.673	1.988, 10.988	0.000	
	Habitation													
	Urban	0.445	0.232	3.669	1.267	0.809, 1.986	0.301	0.256	0.281	0.828	1.898	1.139, 3.163	0.014	
	Annual income, Yuan													
	20,000–29,999	-0.193	0.467	0.171	0.608	0.254, 1.456	0.264	0.120	0.551	0.047	1.521	0.551, 4.195	0.418	
	30,000–59,999	0.999	0.876	1.299	3.867	0.708, 21.124	0.118	0.365	0.748	0.238	2.837	0.689, 11.672	0.149	
	60,000–100,000	2.102	0.896	5.500	9.375	1.650, 53.285	0.012	0.323	0.858	0.142	2.664	0.513, 13.823	0.244	
	> 100,000	2.310	1.147	4.054	11.675	1.196, 113.932	0.035	-2.184	1.937	1.271	0.853	0.015, 47.781	0.938	
	Pregnancy vomiting reaction													
	Slight	-1.148	0.793	2.094	0.247	0.051, 1.186	0.081	0.002	0.605	0.000	0.440	0.135, 1.431	0.172	
	Moderate	-1.333	1.158	1.325	0.167	0.017, 1.615	0.122	-15.466	47.167	0.000	0.000	0.000, 1.978	0.997	
	Serious	-1.778	1.856	0.918	0.232	0.008, 6.846	0.397	-12.652	57.168	0.000	0.000	0.000, 1.325	0.998	
	Dietary habit													
Four meals a day	-0.043	0.372	0.013	1.036	0.500, 2.147	0.925	-0.619	0.677	0.837	1.886	0.582, 6.116	0.290		
Five or six meals a day	-1.709	0.864	3.906	0.167	0.031, 0.904	0.038	15.136	44.163	0.000	0.000	0.000, 5.348	0.997		
Rule-less	-1.214	1.403	0.749	0.278	0.027, 2.909	0.285	13.819	37.167	0.000	0.000	0.000, 7.616	0.998		

Note. ¹Normal, low and high group, FT₄ or TSH is within, below and above the normal range, respectively.
²Multivariate Binary logistic regression.

Supplementary Table S6. Factors affecting pregnant women's thyroid related antibodies

Indication	Classification	Normal group ¹ and high group ¹					
		β	SE	Wald χ^2	OR	95% CI	P ²
TPOAb	Age						
	30–40 years old	-0.068	0.123	0.308	0.934	0.734, 1.188	0.579
	Gestation						
	Middle trimester	-0.323	0.176	3.359	0.645	0.466, 0.892	0.008
	Last trimester	0.014	0.185	0.006	1.010	0.720, 1.417	0.955
	Habitation						
	Urban	-0.069	0.140	0.244	0.937	0.716, 1.227	0.638
	Annual income, yuan						
	20,000–29,999	-0.445	0.254	3.058	0.629	0.383, 1.033	0.067
	30,000–59,999	-1.189	0.343	12.027	0.409	0.209, 0.802	0.009
	60,000–100,000	-1.116	0.373	8.946	0.400	0.193, 0.830	0.014
	> 100,000	-1.640	0.580	8.008	0.228	0.075, 0.701	0.010
	Pregnancy vomiting reaction						
	Slight	0.856	0.285	9.037	1.666	0.946, 2.935	0.077
	Moderate	1.026	0.632	2.640	1.572	0.461, 5.357	0.470
	Serious	-0.410	1.375	0.089	0.271	0.019, 3.855	0.335
	Dietary habit						
Four meals a day	0.025	0.256	0.010	1.534	0.929, 2.533	0.095	
Five or six meals a day	-0.053	0.588	0.008	1.463	0.475, 4.508	0.508	
Rule-less	1.656	1.200	1.905	9.583	0.923, 99.493	0.058	
TgAb	Age						
	30–40 years old	-0.055	0.158	0.122	0.946	0.695, 1.289	0.727
	Gestation						
	Middle trimester	-0.251	0.226	1.226	0.674	0.453, 1.005	0.053
	Last trimester	-0.208	0.245	0.718	0.763	0.493, 1.181	0.225
	Habitation						
	Urban	-0.112	0.185	0.364	0.820	0.578, 1.165	0.269
	Annual income, Yuan						
	20,000–29,999	0.027	0.296	0.008	0.798	0.452, 1.407	0.435
	30,000–59,999	0.078	0.481	0.026	1.103	0.444, 2.739	0.833
	60,000–100,000	-0.078	0.524	0.022	0.917	0.341, 2.466	0.864
	> 100,000	0.059	0.774	0.006	0.721	0.173, 3.010	0.653
	Pregnancy vomiting reaction						
	Slight	-0.421	0.411	1.047	0.613	0.279, 1.351	0.225
	Moderate	-1.462	0.997	2.152	0.231	0.036, 1.502	0.125
	Serious	-20.132	47.560	0.000	0.000	0.000, 3.997	0.997
	Dietary habit						
Four meals a day	0.210	0.324	0.421	1.682	0.914, 3.097	0.095	
Five or six meals a day	1.203	0.914	1.734	3.471	0.627, 19.225	0.154	
Rule-less	19.462	59.660	0.000	0.000	0.000, 5.991	0.997	

Note. ¹Normal and high group, TPOAb or TgAb is within and greater than the normal range, respectively.
²Multivariate Binary logistic regression.