Supplementary Table 1a. Characteristics of men and women participants between TSH levels which were divided into four groups

Men	All	Q1	Q2	Q3	Q4	P-value
TSH (µIU/ml)	0.55-4.78	0.55-1.30	1.31-1.85	1.85-2.58	2.59-4.78	
N	1,831	558	522	407	344	-
Age (years)	49.66±11.89	48.97±12.21	48.99±11.50	49.68±11.38	51.76±12.33	**0.003**
BMI (kg/m^2)	26.15±3.75	25.73±3.73	26.31±3.74	26.01±3.53	26.74±3.98	**0.001**
Obesity (BMI ≥ 28 kg/m^2) (n, %)	532 (29.1)	145 (26.0)	156 (29.9)	105 (25.8)	126 (36.6)	**0.002**
WC (cm)	89.40±10.24	88.18±10.27	90.16±10.01	89.02±9.94	90.66±10.69	**0.001**
SBP (mmHg)	132±17	132±17	132±16	131±16	133±18	0.442
DBP (mmHg)	81±12	81±12	82±11	81±11	81±12	0.688
HbA1c (%)	5.83±0.99	5.78±0.92	5.84±0.96	5.77±0.83	5.97±1.27	**0.023**
FPG (mmol/l)	6.25±1.75	6.18±1.67	6.25±1.86	6.26±1.69	6.33±1.76	0.622
FINS (uIU/ml)	9.56±6.74	8.87±6.27	10.01±7.36	9.44±6.19	10.13±7.01	**0.012**
HOMA-IR (mU/L·mM)	2.12 (1.29, 3.36)	1.92 (1.23, 3.00)	2.31 (1.37, 3.45)	2.20 (1.28, 3.31)	2.26 (1.32, 3.73)	**0.010**
TG (mmol/l)	1.29 (0.83, 2.13)	1.18 (0.74, 1.89)	1.43 (0.97, 2.23)	1.27 (0.81, 2.11)	1.29 (0.82, 2.24)	**<0.001**
TC (mmol/l)	4. 89±0.95	4.85±0.95	4.95±0.94	4.80±0.96	4.95±0.93	**0.040**
HDL-C (mmol/l)	1.11±0.32	1.13±0.33	1.09±0.30	1.09±0.31	1.12±0.33	0.067
LDL-C (mmol/l)	2.83±0.79	2.79±0.79	2.91±0.79	2.75±0.78	2.89±0.81	**0.006**
UA (µmol/l)	324.29±78.41	314.69±74.97	332.12±81.21	325.37±77.15	326.72±79.75	**0.003**
FT4 (pmol/l)	16.63 (15.18, 18.24)	17.04 (15.50, 18.62)	16.67 (15.42, 18.35)	16.66 (15.13, 18.19)	15.89 (14.40, 17.48)	**<0.001**
FT3 (pmol/l)	5.20 (4.88, 5.54)	5.25 (4.94, 5.58)	5.21 (4.91, 5.54)	5.20 (4.86, 5.53)	5.13 (4.80, 5.46)	**0.012**
Antibodys (n, %)						**0.018**
TPOAb and TGAb (-)	1,655 (90.4)	505 (90.8)	479 (91.8)	366 (89.9)	305 (88.7)	
TPOAb or TGAb (+)	131 (7.2)	42 (7.5)	36 (6.9)	32 (7.9)	21 (6.1)	
TPOAb and TGAb (+)	45 (2.5)	11 (2.0)	7 (1.3)	9 (2.2)	18 (5.2)	

	All	Q1	Q2	Q3	Q4	P-value
MetS (n, %)	781 (42.7)	217 (38.9)	233 (44.6)	167 (41.0)	164 (47.7)	**0.045**
Smoking (n, %)						**<0.001**
Nonsmoker	373 (20.4)	94 (16.8)	100 (19.2)	97 (23.8)	82 (23.8)	
Ex-smoker	280 (15.3)	75 (13.4)	70 (13.4)	63 (15.5)	72 (20.9)	
Current smoker	1,178 (64.3)	389 (69.7)	352 (67.4)	247 (60.7)	190 (55.2)	
Alcohol drinking (g/week) (n, %)						0.096
0	535 (29.2)	160 (28.7)	132 (25.3)	131 (32.2)	112 (32.6)	
0.1-140	728 (39.8)	226 (40.5)	230 (44.1)	156 (38.3)	116 (33.7)	
140.1-210	54 (2.9)	17 (3.0)	16 (3.1)	14 (3.4)	7 (2.0)	
>210	514 (28.1)	155 (27.8)	144 (27.6)	106 (26.0)	109 (31.7)	
Red meat consumption ≥7 times per week (%) (n, %)	842 (46.0)	257 (46.1)	251 (48.1)	186 (45.7)	148 (43.0)	0.541
Sedentary time (n, %)						0.692
<1.5	120 (6.6)	39 (7.0)	28 (5.4)	29 (7.1)	24 (7.0)	
1.5-2.5	405 (22.1)	112 (20.1)	124 (23.8)	89 (21.9)	80 (23.3)	
2.5-3.5	391 (21.4)	127 (22.8)	112 (21.5)	76 (18.7)	76 (22.2)	
3.5-4.5	312 (17.0)	89 (15.9)	88 (16.9)	82 (20.1)	53 (15.4)	
≥ 4.5	603 (32.9)	191 (34.2)	170 (32.6)	131 (32.2)	111 (32.3)	

Supplementary Table 1b.

Women	All	Q1	Q2	Q3	Q4	P-value
TSH (µIU/ml)	0.55-4.78	0.55-1.30	1.31-1.85	1.85-2.58	2.59-4.78	
N	1,742	327	384	478	553	-
Age (years)	49.97±11.58	51.04±12.36	49.41±12.51	48.63±10.91	50.88±10.85	**0.004**
BMI (kg/m^2)	26.02±3.90	25.60±3.44	25.82±3.87	26.01±3.84	26.42±4.20	**0.014**
Obesity (BMI ≥ 28 kg/m^2) (n, %)	488 (28.0)	70 (21.4)	101 (26.3)	127 (26.6)	190 (34.4)	**<0.001**
WC (cm)	84.06±10.81	83.27±9.84	84.01±11.07	83.33±10.74	85.18±11.17	**0.020**

SBP (mmHg)	128±19	128±19	127±19	127±18	130±19	0.069
DBP (mmHg)	77±11	75±10	76±11	77±11	78±11	**0.006**
HbA1c (%)	5.81±0.86	5.86±0.92	5.77±0.86	5.74±0.72	5.85±0.94	0.108
FPG (mmol/l)	5.88±1.45	5.97±1.59	5.82±1.43	5.78±1.23	5.94±1.55	0.197
FINS (uIU/ml)	9.69±5.85	9.39±7.01	9.57±5.26	9.68±5.45	9.96±5.81	0.534
HOMA-IR (mU/L·mM)	2.12 (1.44, 3.14)	2.03 (1.44, 3.12)	2.16 (1.43, 3.09)	2.11 (1.42, 3.14)	2.20 (1.47, 3.25)	0.575
TG (mmol/l)	1.12 (0.72, 1.66)	1.07 (0.69, 1.55)	1.06 (0.71, 1.59)	1.12 (0.72, 1.68)	1.21 (0.76, 1.81)	**0.020**
TC (mmol/l)	4.93±1.00	4.95±1.02	4.93±1.08	4.92±0.94	4.94±0.98	0.986
HDL-C (mmol/l)	1.21±0.29	1.23±0.29	1.23±0.27	1.22±0.33	1.19±0.27	0.070
LDL-C (mmol/l)	2.89±0.81	2.91±0.82	2.89±0.81	2.88±0.78	2.90±0.83	0.943
UA (µmol/l)	246.93±61.96	241.86±58.85	242.54±58.97	249.33±64.98	250.91±62.87	0.068
FT4 (pmol/l)	15.53 (14.23, 16.84)	15.90 (14.71, 17.59)	15.77 (14.54, 16.88)	15.21 (14.05, 16.61)	15.30 (14.05, 16.58)	**<0.001**
FT3 (pmol/l)	4.78 (4.49, 5.06)	4.79 (4.46, 5.07)	4.77 (4.47, 5.07)	4.79 (4.50, 5.03)	4.78 (4.50, 5.08)	0.871
Antibodys (n, %)						**<0.001**
TPOAb and TGAb (-)	1,380 (79.2)	279 (85.3)	324 (84.4)	377 (78.9)	400 (72.3)	
TPOAb or TGAb (+)	206 (11.8)	29 (8.9)	44 (11.5)	56 (11.7)	77 (13.9)	
TPOAb and TGAb (+)	156 (9.0)	19 (5.8)	16 (4.2)	45 (9.4)	76 (13.7)	
MetS (n, %)	861 (49.4)	156 (47.7)	179 (46.6)	224 (46.9)	302 (54.6)	**0.032**
Postmenopausal status (n, %)	850 (48.8)	170 (52.0)	183 (47.7)	202 (42.3)	295 (53.3)	**0.003**
Smoking (n, %)						0.622
Nonsmoker	1,724 (99.0)	324 (99.1)	380 (99.0)	474 (97.2)	546 (98.7)	
Ex-smoker	2 (0.1)	0 (0)	0 (0)	0 (0)	2 (0.4)	
Current smoker	16 (0.9)	3 (0.9)	4 (1.0)	4 (0.8)	5 (0.9)	
Alcohol drinking (g/week) (n, %)						0.648
0	1,565 (89.8)	292 (89.3)	351 (91.4)	430 (90.0)	492 (89.0)	

0.1-70	132 (7.6)	25 (7.6)	25 (6.5)	36 (7.5)	46 (8.3)	
70.1-140	20 (1.1)	7 (2.1)	2 (0.5)	6 (1.3)	5 (0.9)	
>140	25 (1.4)	3 (0.9)	6 (1.6)	6 (1.3)	10 (1.8)	
Red meat consumption ≥7 times per week (%) (n, %)	582 (33.4)	133 (40.7)	126 (32.8)	159 (33.3)	164 (29.7)	**0.010**
Sedentary time (hours/day) (n, %)						**0.005**
<1.5	125 (7.2)	15 (4.6)	29 (7.6)	45 (9.4)	36 (6.5)	
1.5-2.5	426 (24.5)	75 (22.9)	102 (26.6)	125 (26.2)	124 (22.4)	
2.5-3.5	485 (27.8)	106 (32.4)	81 (21.1)	142 (29.7)	156 (28.2)	
3.5-4.5	321 (18.4)	61 (18.7)	71 (18.5)	84 (17.6)	105 (19.0)	
≥ 4.5	385 (22.1)	70 (21.4)	101 (26.3)	82 (17.2)	132 (23.9)	

Notes: Data were expressed as means ± SD for continuous data with normal distribution, median (25th, 75th percentage) for continuous data with skewed distribution, and n (%) for categorical data. *P*-value was for the difference for the difference among the TSH quartiles using one-way ANOVA for normal distributed data, Kruskal-Wallis test for skewed distributed data, and chi-squared test for categorical data. *P*-value <0.05 was considered significant and in boldface.

Abbreviations: TSH, thyrotropin; Q, quartile; BMI, body mass index; WC, waist circumference; SBP, systolic blood pressure; DBP, diastolic blood pressure; HbA1c, haemoglobin A1c; FPG, fasting plasma glucose; FINS, fasting insulin; HOMA-IR, homeostasis model assessment of insulin resistance; TG, triglycerides; TC, total cholesterol; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol; UA, uric acid; FT4, free thyroxine; FT3, free triiodothyronine; TPOAb, thyroid peroxidase antibody; TGAb, thyroglobulin antibody; MetS, metabolic syndrome.
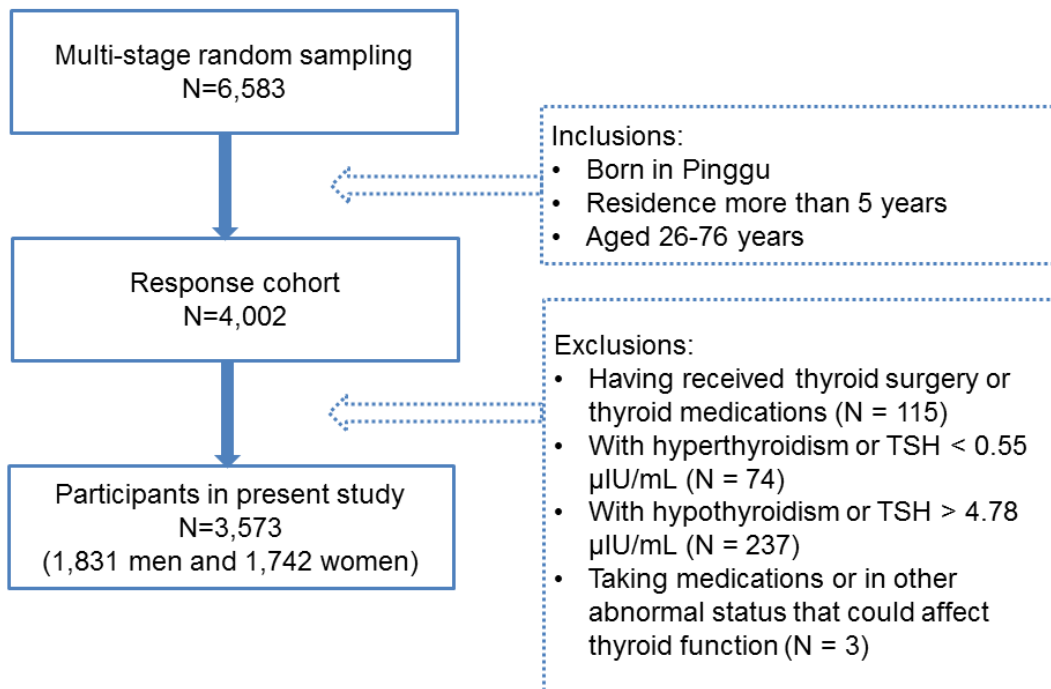
Figure S1 Flow diagram for the participants recruitment. **Abbreviations:** PMDS, Pinggu Metabolic Disease Study; TSH, thyrotropin.