Supplemental Material

Table S1. Optimal BMI-specific BRI, WHtR and WHR thresholds for identifying participants with CVD associated risk factor among Chinese

Risk factor	Underweight				Normal weight				Overweight				Obese		
	Cut-off	Sensitivity	Specificity	Youden	Cut-off	Sensitivity	Specificity	Youden	Cut-off	Sensitivity	Specificity	Youden	Cut-off	Sensitivity	Specificity	Youden
Index=BRI																
Female																
Hypercholesterolemia	1.9	58.6	60.9	0.195	2.8	56.8	60.7	0.174	3.9	57.6	51.1	0.088	5.3	51.6	54.0	0.056
Hypertriglyceridemia	1.9	61.6	60.8	0.224	2.8	67.8	62.4	0.302	3.9	59.8	53.6	0.134	5.2	53.1	51.2	0.043
Mixed hyperlipidemia	2.0	71.9	69.9	0.418	2.9	70.4	66.3	0.367	4.0	62.7	57.6	0.203	5.3	57.8	55.1	0.129
Dyslipidemia	1.9	61.4	61.6	0.231	2.8	65.6	65.1	0.307	3.9	61.1	57.6	0.187	5.2	55.4	55.0	0.104
Hypertension	2.0	59.0	71.0	0.300	2.9	68.7	68.3	0.370	4.0	64.9	61.8	0.267	5.2	62.8	56.9	0.197
Diabetic Mellitus	1.9	66.3	70.1	0.364	3.0	72.4	71.1	0.435	4.2	64.6	68.0	0.327	5.4	63.8	60.3	0.241
Chronic kidney disease	1.9	58.6	69.9	0.285	3.1	66.4	75.2	0.416	4.2	68.3	66.5	0.348	5.6	60.0	65.8	0.258
With at least one risk	1.8	61.9	62.4	0.243	2.8	66.1	67.2	0.334	3.9	62.4	63.0	0.254	5.0	65.3	55.4	0.207
Male																
Hypercholesterolemia	1.8	58.6	61.3	0.200	3.0	51.4	56.8	0.082	3.9	51.8	51.8	0.036	4.9	57.8	48.0	0.058
Hypertriglyceridemia	1.8	57.4	61.9	0.193	2.9	65.2	54.7	0.199	3.9	51.6	54.1	0.057	4.9	53.0	48.8	0.018
Mixed hyperlipidemia	1.8	65.7	60.9	0.266	3.0	68.0	57.7	0.257	3.9	57.5	52.8	0.103	4.9	56.0	48.5	0.045
Dyslipidemia	1.8	58.4	62.9	0.213	2.9	65.7	57.7	0.234	3.8	59.9	50.7	0.106	4.9	53.8	51.8	0.056
Hypertension	1.8	60.9	63.0	0.238	3.0	63.7	60.4	0.241	3.9	61.7	56.7	0.184	5.0	55.6	59.2	0.148
Diabetic Mellitus	1.8	65.5	61.3	0.268	3.1	64.6	64.7	0.293	4.0	61.9	60.5	0.224	5.1	57.8	60.9	0.187
Chronic kidney disease	1.8	65.8	61.5	0.273	3.2	58.2	69.8	0.280	4.1	62.2	65.3	0.276	5.2	60.3	64.3	0.246
With at least one risk	1.8	58.4	65.6	0.239	2.9	65.3	62.4	0.276	3.8	61.0	57.5	0.186	4.8	60.2	54.2	0.144
Index=WHtR																
Female																

Hypercholesterolemia	0.41	58.6	60.9	0.195	0.47	58.3	59.4	0.177	0.53	58.1	50.6	0.086	0.59	57.7	48.0	0.057
Hypertriglyceridemia	0.41	61.6	60.8	0.224	0.47	69.1	61.2	0.303	0.53	60.3	53.0	0.133	0.59	55.1	48.9	0.040
Mixed hyperlipidemia	0.42	66.7	74.2	0.409	0.48	67.2	68.9	0.361	0.54	58.0	62.1	0.201	0.59	64.9	49.2	0.141
Dyslipidemia	0.41	61.4	61.6	0.230	0.47	67.0	63.9	0.309	0.53	61.6	57.0	0.187	0.59	57.7	52.9	0.105
Hypertension	0.42	67.1	61.7	0.288	0.48	65.9	70.9	0.368	0.54	60.1	66.3	0.264	0.59	65.3	54.8	0.200
Diabetic Mellitus	0.42	63.2	74.4	0.376	0.48	75.0	68.7	0.436	0.54	70.3	62.5	0.328	0.60	65.0	59.0	0.240
Chronic kidney disease	0.41	65.5	60.5	0.260	0.49	64.9	76.5	0.414	0.55	63.6	70.8	0.344	0.61	60.5	65.4	0.259
With at least one risk	0.41	61.9	62.3	0.243	0.47	67.4	66.0	0.334	0.53	63.0	62.4	0.253	0.59	59.3	60.9	0.202
Male																
Hypercholesterolemia	0.41	58.6	61.3	0.199	0.48	54.5	53.4	0.079	0.53	52.7	51.0	0.037	0.58	55.9	49.6	0.055
Hypertriglyceridemia	0.41	57.4	61.9	0.193	0.48	61.7	57.8	0.195	0.53	52.4	53.2	0.056	0.58	51.5	50.5	0.020
Mixed hyperlipidemia	0.41	65.7	60.9	0.266	0.48	71.2	54.4	0.256	0.53	58.3	51.9	0.102	0.58	54.2	50.1	0.043
Dyslipidemia	0.41	58.4	62.8	0.213	0.48	62.2	60.8	0.230	0.53	53.5	56.5	0.100	0.58	52.3	53.5	0.057
Hypertension	0.41	60.9	62.9	0.238	0.48	66.9	57.0	0.239	0.53	62.6	55.9	0.184	0.58	59.8	55.1	0.149
Diabetic Mellitus	0.41	65.5	61.3	0.268	0.49	62.4	66.6	0.290	0.54	55.9	66.1	0.220	0.59	55.2	63.3	0.185
Chronic kidney disease	0.41	65.8	61.5	0.273	0.49	61.9	65.5	0.274	0.54	62.7	64.7	0.274	0.59	62.5	61.3	0.239
With at least one risk	0.41	58.4	65.5	0.239	0.48	62.0	65.5	0.275	0.53	54.8	63.4	0.182	0.58	53.1	61.1	0.141
Index=WHR																
Female																
Hypercholesterolemia	0.76	62.6	51.5	0.141	0.81	61.3	53.8	0.151	0.87	52.2	53.2	0.054	0.90	53.0	48.1	0.011
Hypertriglyceridemia	0.77	60.3	61.7	0.219	0.83	68.7	62.0	0.307	0.87	60.3	56.8	0.171	0.91	51.1	59.1	0.102
Mixed hyperlipidemia	0.78	70.2	69.0	0.392	0.84	68.7	67.0	0.357	0.87	65.4	54.4	0.199	0.90	63.5	49.5	0.13
Dyslipidemia	0.77	56.5	62.2	0.187	0.83	65.3	64.5	0.298	0.87	59.9	60.6	0.205	0.90	58.8	54.8	0.136
Hypertension	0.77	64.7	62.3	0.270	0.83	65.4	68.7	0.341	0.88	59.8	65.0	0.248	0.90	64.5	55.0	0.195
Diabetic Mellitus	0.77	73.7	61.5	0.352	0.84	71.3	72.5	0.438	0.89	65.0	68.4	0.335	0.92	58.6	64.5	0.231
Chronic kidney disease	0.78	58.6	69.1	0.277	0.83	71.1	66.2	0.374	0.89	65.5	66.8	0.323	0.91	64	56.3	0.203

With at least one risk	0.77	58.2	62.9	0.211	0.82	65.5	66.5	0.320	0.87	60.2	65.4	0.257	0.90	59.3	62.1	0.214
Male																
Hypercholesterolemia	0.81	49.6	61.3	0.109	0.87	57.8	49.0	0.069	0.92	49.3	52.5	0.018	0.95	51.3	48.8	0.001
Hypertriglyceridemia	0.81	56.7	62.2	0.188	0.88	58.7	60.7	0.194	0.92	51.9	55.5	0.074	0.95	52.9	50.7	0.036
Mixed hyperlipidemia	0.82	74.3	68.7	0.430	0.88	67.2	57.3	0.244	0.92	58.2	53.6	0.118	0.95	56.5	49.7	0.062
Dyslipidemia	0.81	56.0	62.9	0.189	0.88	58.9	63.5	0.224	0.91	62	50.7	0.127	0.95	53.6	54.5	0.081
Hypertension	0.80	61.7	52.3	0.139	0.88	62.9	59.8	0.226	0.92	60.8	57.3	0.182	0.95	59.9	54.2	0.141
Diabetic Mellitus	0.81	57.5	61.4	0.189	0.89	68.4	65.9	0.343	0.93	63.4	63.0	0.265	0.96	60.1	60.4	0.205
Chronic kidney disease	0.80	68.4	51.4	0.198	0.89	58.2	64.4	0.226	0.93	61.9	61.2	0.231	0.96	58.5	58.1	0.166
With at least one risk	0.81	52.6	64.5	0.171	0.87	66.1	60.9	0.271	0.91	62.9	57.7	0.205	0.95	54.1	62.1	0.162

Abbreviation: BRI, body round index; WHtR, waist height ratio; WHR, waist hip ratio.

Table S2. Odds ratios for high BRI, high WHtR and high WHR and with at least one CVD risk factors by age stratification

Age strata	Male				Female			
	Underweight	Normal weight	Overweight	Obese	Underweight	Normal weight	Overweight	Obese
Index=BRI	High-BRI ≥1.8	High-BRI ≥3.0	High-BRI ≥3.9	High-BRI ≥5.0	High-BRI ≥1.9	High-BRI ≥2.9	High-BRI ≥4.0	High-BRI ≥5.2
<40 years	1.90(1.47,2.46)	2.86(2.74,2.98)	2.10(2.02,2.18)	1.79(1.66,1.93)	1.41(1.15,1.74)	2.63(2.50,2.77)	2.05(1.90,2.21)	1.91(1.65,2.20)
40-59 years	1.79(1.52,2.11)	2.35(2.29,2.42)	1.70(1.66,1.75)	1.57(1.48,1.66)	1.47(1.26,1.70)	2.24(2.17,2.30)	1.85(1.77,1.92)	1.66(1.52,1.82)
≥ 60 years	1.68(1.32,2.14)	1.93(1.83,2.04)	1.38(1.31,1.46)	1.38(1.22,1.55)	1.52(1.17,1.98)	1.90(1.79,2.02)	1.66(1.54,1.80)	1.45(1.21,1.73)
P interact*	0.526	<0.001	<0.001	0.002	0.695	<0.001	0.002	0.042
Index=WHtR	High-WHtR ≥0.41	High-WHtR ≥0.48	High-WHtR ≥0.53	High-WHtR ≥0.58	High-WHtR ≥0.41	High-WHtR ≥0.48	High-WHtR ≥0.54	High-WHtR ≥0.59
<40 years	1.89(1.46,2.45)	2.86(2.75,2.98)	2.09(2.01,2.17)	1.74(1.61,1.87)	1.49(1.22,1.81)	2.67(2.54,2.81)	2.07(1.92,2.24)	1.90(1.65,2.19)
40-59 years	1.79(1.52,2.10)	2.37(2.31,2.44)	1.70(1.65,1.74)	1.58(1.49,1.67)	1.49(1.28,1.74)	2.24(2.18,2.31)	1.83(1.75,1.90)	1.67(1.53,1.83)
≥ 60 years	1.68(1.32,2.15)	1.97(1.87,2.07)	1.38(1.31,1.46)	1.44(1.27,1.62)	1.50(1.13,1.98)	1.88(1.77,1.99)	1.61(1.49,1.74)	1.47(1.23,1.76)
P interact*	0.541	<0.001	<0.001	0.023	0.977	<0.001	<0.001	0.061
Index=WHR	High-WHR ≥0.81	High-WHR ≥0.88	High-WHR ≥0.92	High-WHR ≥0.95	High-WHR ≥0.77	High-WHR ≥0.83	High-WHR ≥0.88	High-WHR ≥0.90
<40 years	1.91(1.48,2.46)	2.89(2.77,3.01)	2.29(2.20,2.38)	2.07(1.92,2.23)	1.40(1.15,1.71)	2.54(2.41,2.67)	2.43(2.25,2.62)	2.19(1.90,2.52)
40-59 years	1.63(1.39,1.91)	2.34(2.27,2.40)	1.86(1.81,1.91)	1.67(1.58,1.77)	1.57(1.35,1.82)	2.24(2.18,2.31)	1.99(1.92,2.08)	1.87(1.71,2.04)
≥ 60 years	1.39(1.10,1.76)	1.89(1.79,1.99)	1.51(1.43,1.59)	1.35(1.20,1.53)	1.76(1.35,2.30)	1.98(1.87,2.10)	1.64(1.51,1.77)	1.59(1.34,1.90)
P interact*	0.097	<0.001	<0.001	<0.001	0.223	<0.001	<0.001	0.019

*P interact: p value for statistical interaction on a multiplicative scale, derived from a likelihood ratio test comparing a model including the cross-classification anthropometric indices by-BMI-by-age group with a model including separate variables for anthropometric indices-by-BMI and age;
Abbreviation: BRI, body round index; WHtR, waist height ratio; WHR, waist hip ratio;
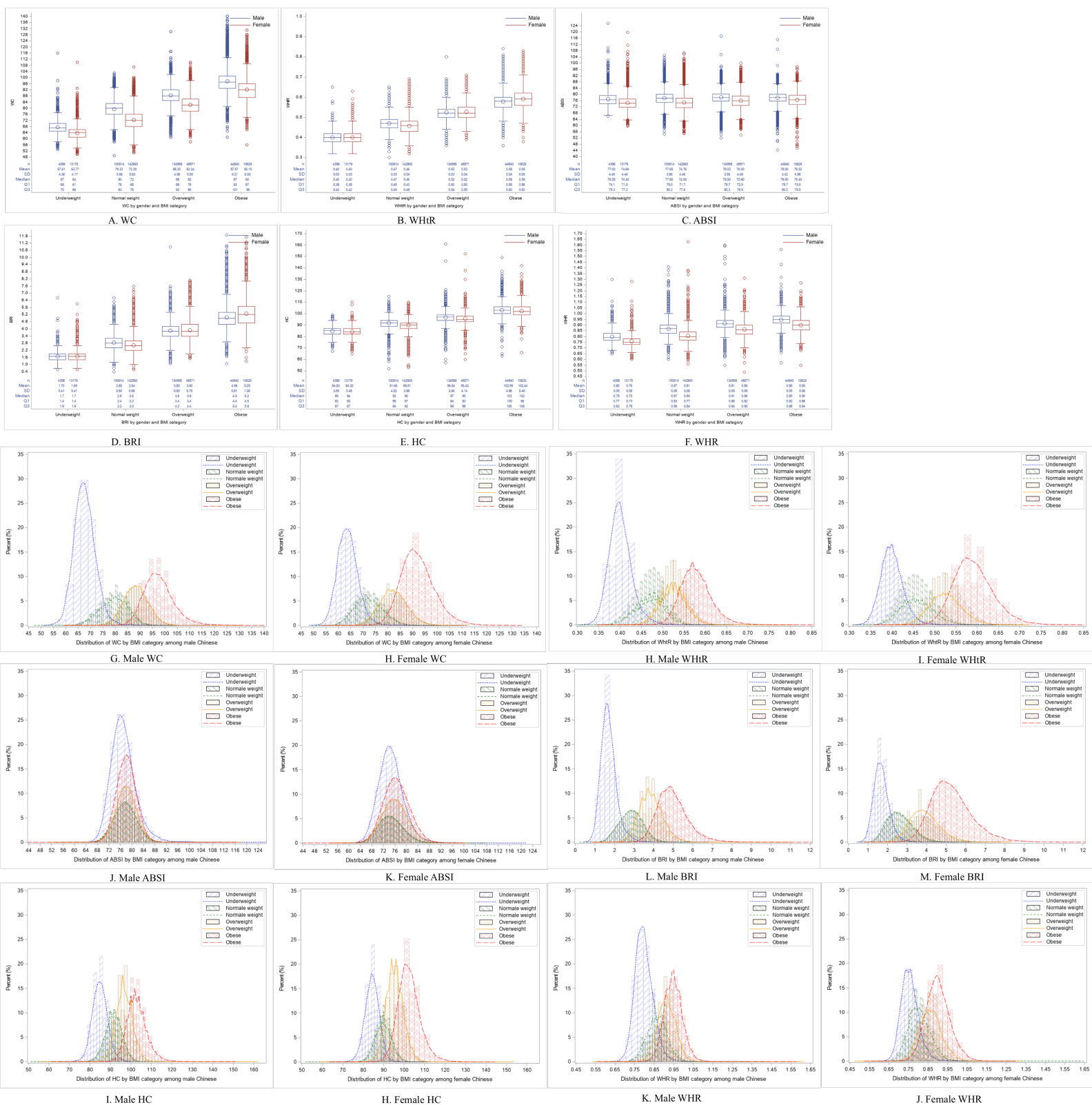
Figure S1. Distribution of anthropometric indices by gender and BMI category among Hunan Chinese

A-F: Boxplot showing the distribution of anthropometric indices by gender and BMI category ; G-J: kernel density estimates (KDE) using Gaussian kernels to display anthropometric indices distribution overlaps between different BMI categories ;
Abbreviation: n, number of persons; SD, standard deviation; Q1, first quartile, the 25th percentile; Q3, third quartile, the 75th percentile; BMI, body mass index; WC, waist circumference; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumference; WHR, waist hip ratio.
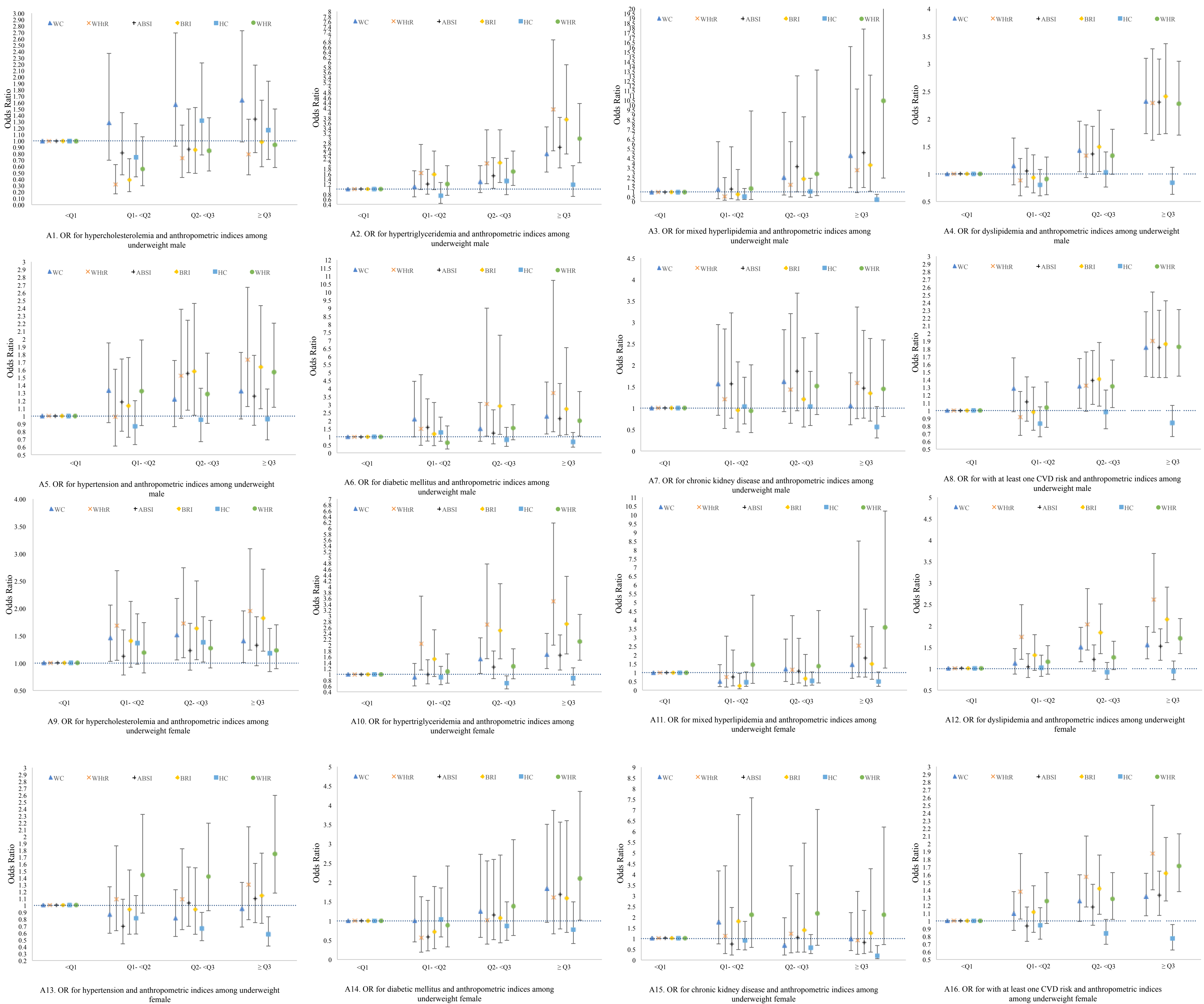
A1. OR for hypercholesterolemia and anthropometric indices among underweight male

A2. OR for hypertriglyceridemia and anthropometric indices among underweight male

A3. OR for mixed hyperlipidemia and anthropometric indices among underweight male

A4. OR for dyslipidemia and anthropometric indices among underweight male

A5. OR for hypertension and anthropometric indices among underweight male

A6. OR for diabetic mellitus and anthropometric indices among underweight male

A7. OR for chronic kidney disease and anthropometric indices among underweight male

A8. OR for with at least one CVD risk and anthropometric indices among underweight male

A9. OR for hypercholesterolemia and anthropometric indices among underweight female

A10. OR for hypertriglyceridemia and anthropometric indices among underweight female

A11. OR for mixed hyperlipidemia and anthropometric indices among underweight female

A12. OR for dyslipidemia and anthropometric indices among underweight female

A13. OR for hypertension and anthropometric indices among underweight female

A14. OR for diabetic mellitus and anthropometric indices among underweight female

A15. OR for chronic kidney disease and anthropometric indices among underweight female

A16. OR for with at least one CVD risk and anthropometric indices among underweight female

Figure S2. Association between CVD risk factors and anthropometric indices among underweight Chinese
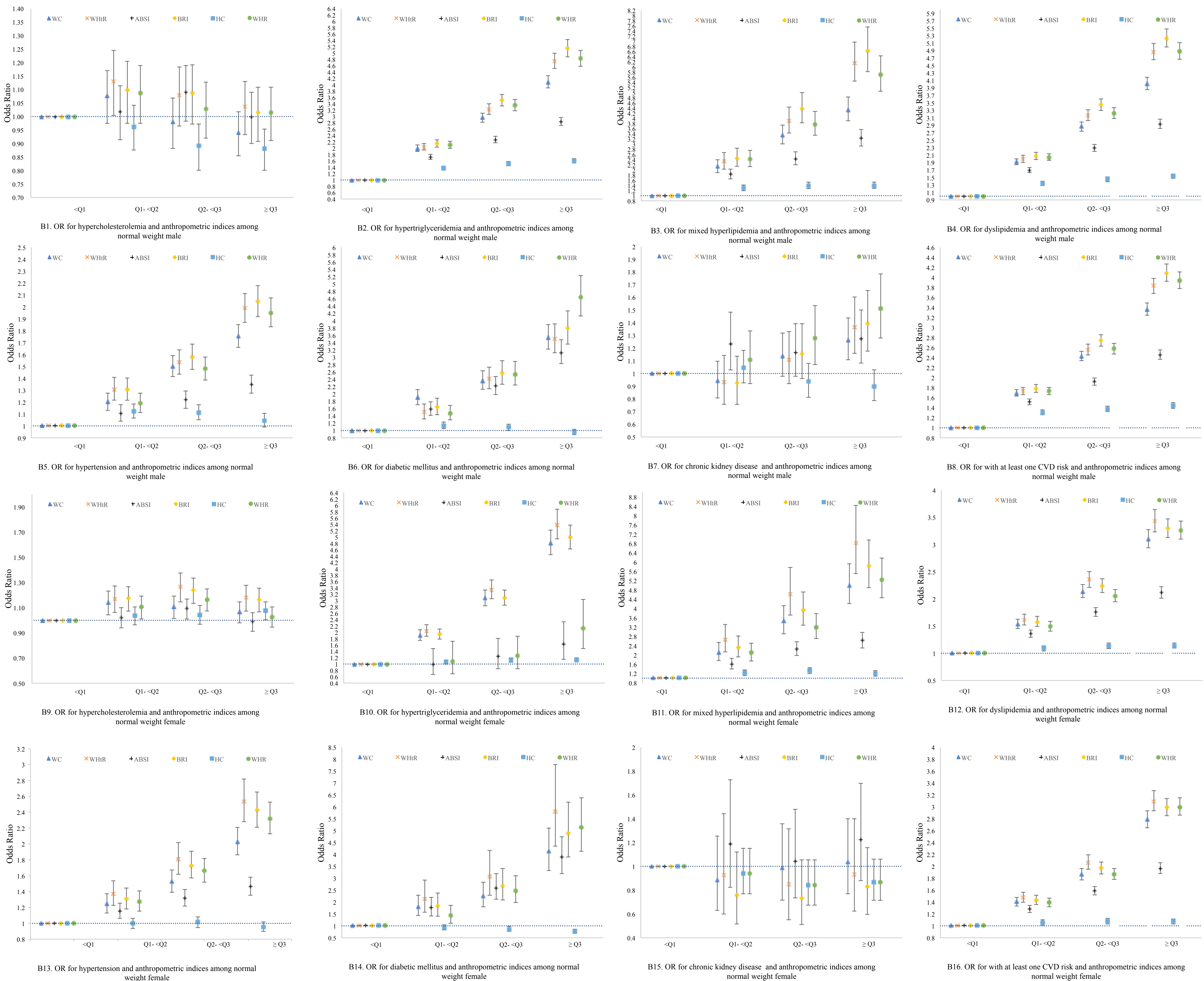
Figure S3. Association between CVD risk factors and anthropometric indices among normal weight Chinese *

* association was adjusted for age, smoking, and drinking status and index at <Q1 level was treated as non-exposed;

Abbreviation: Q1, first quartile, the 25th percentile; Q2: second quartile, median; Q3, third quartile, the 75th percentile; WC, waist circumference; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.
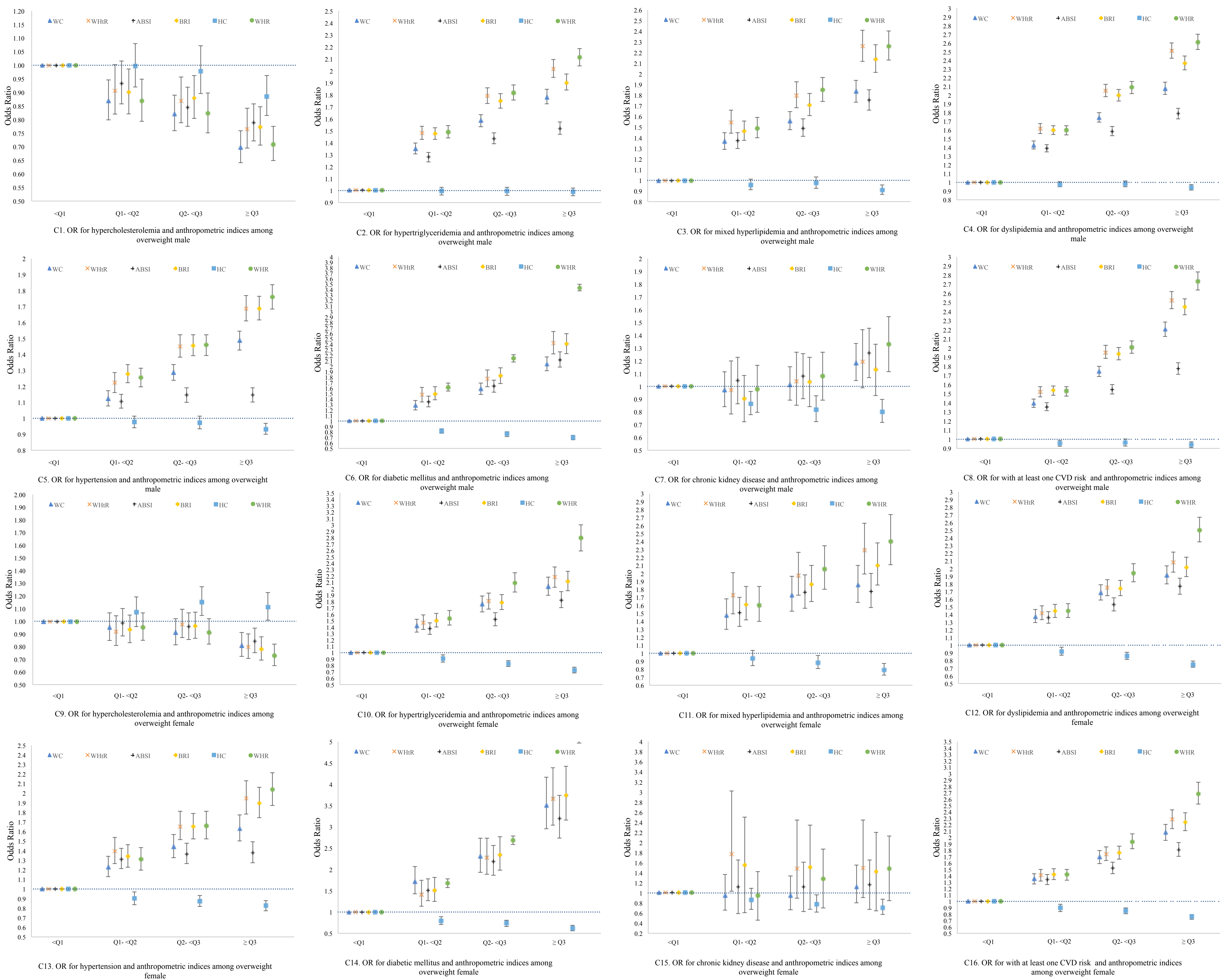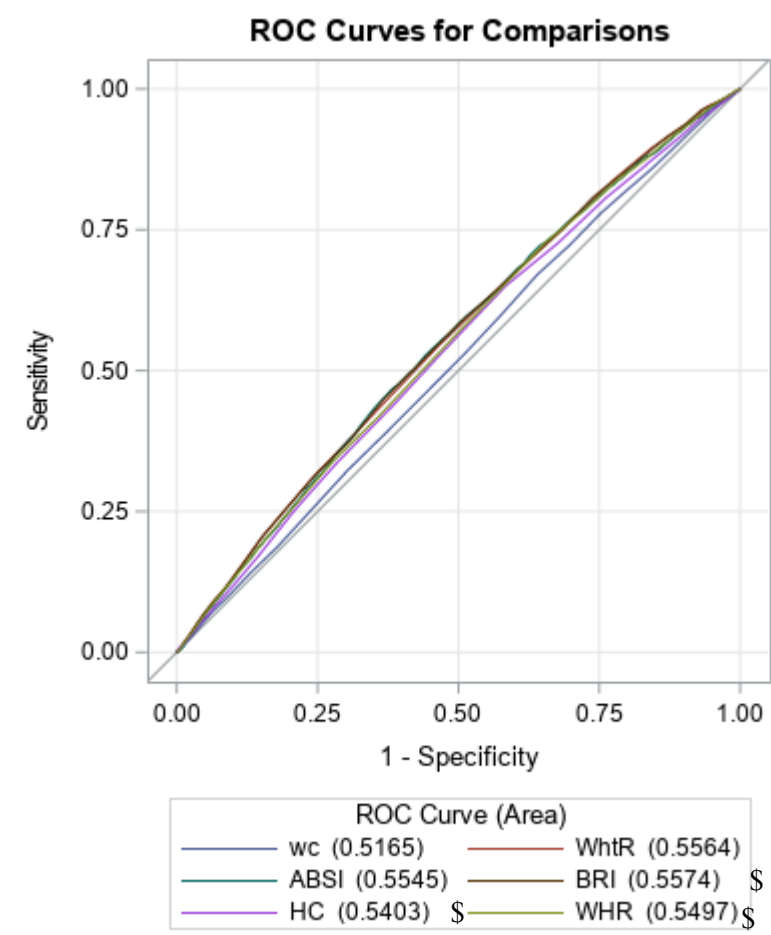
Figure S4. Association between CVD risk factors and anthropometric indices among overweight Chinese *
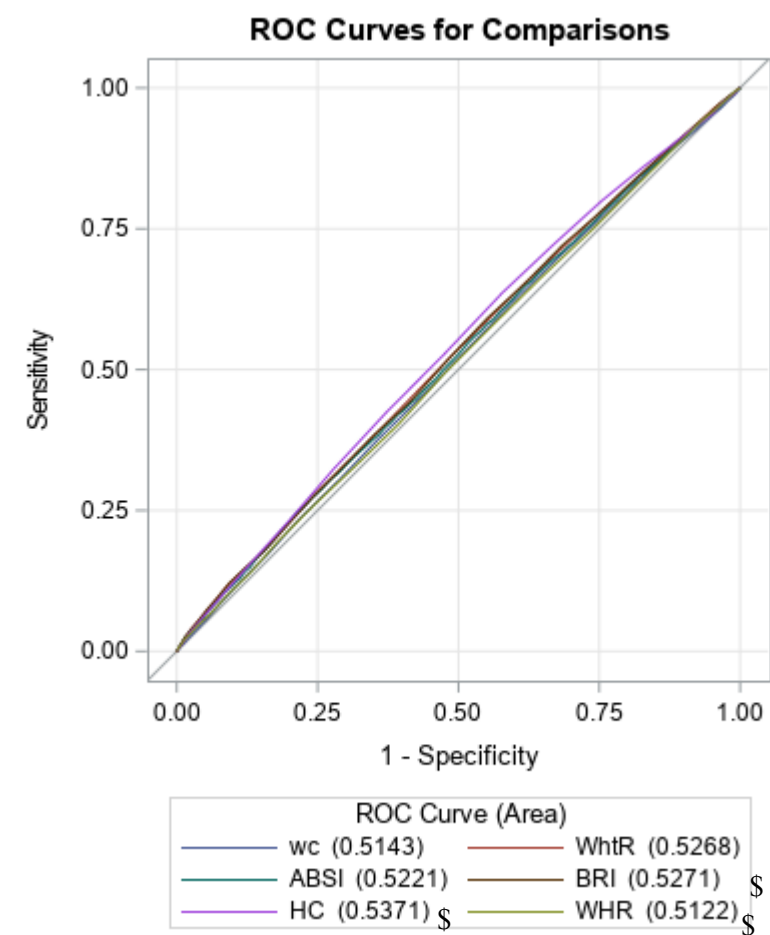
* association was adjusted for age, smoking, and drinking status and index at <Q1 level was treated as non-exposed;

Abbreviation: Q1, first quartile, the 25th percentile; Q2: second quartile, median; Q3, third quartile, the 75th percentile; WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.
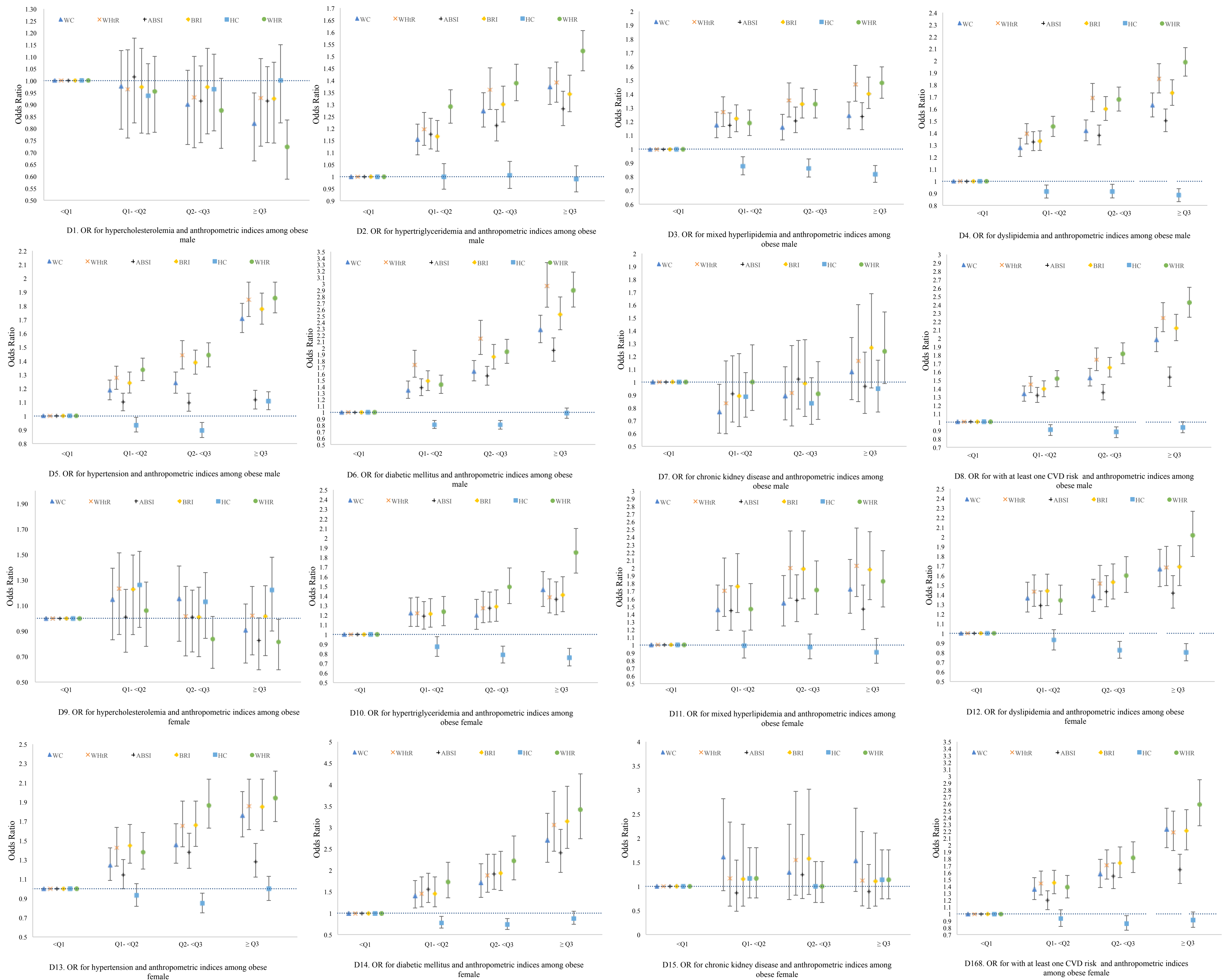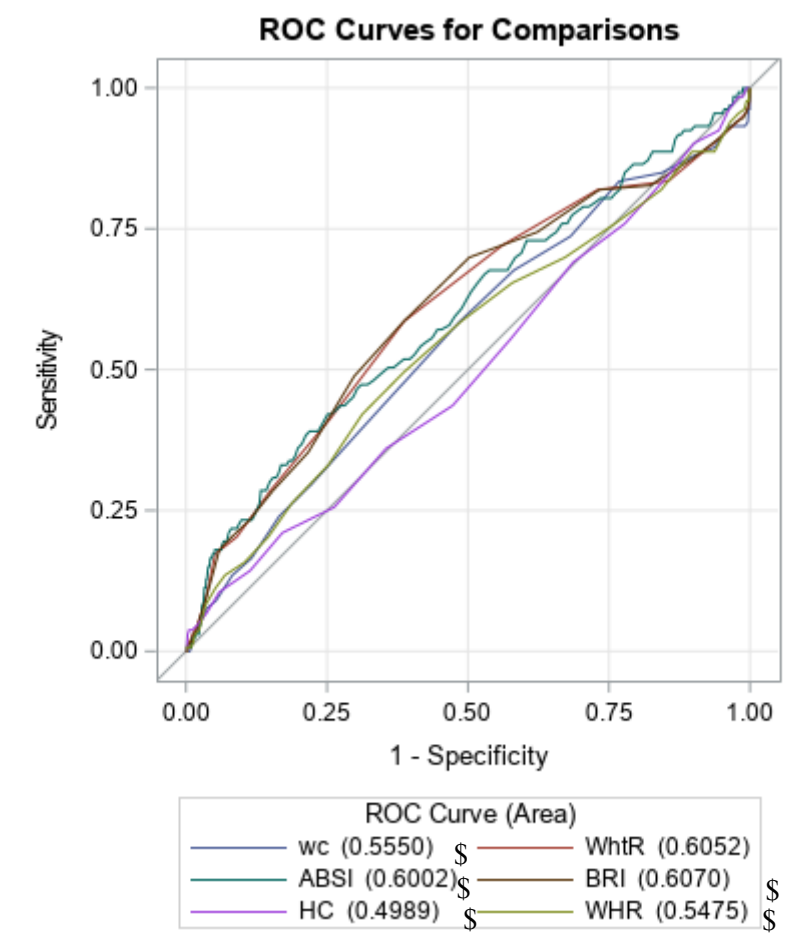
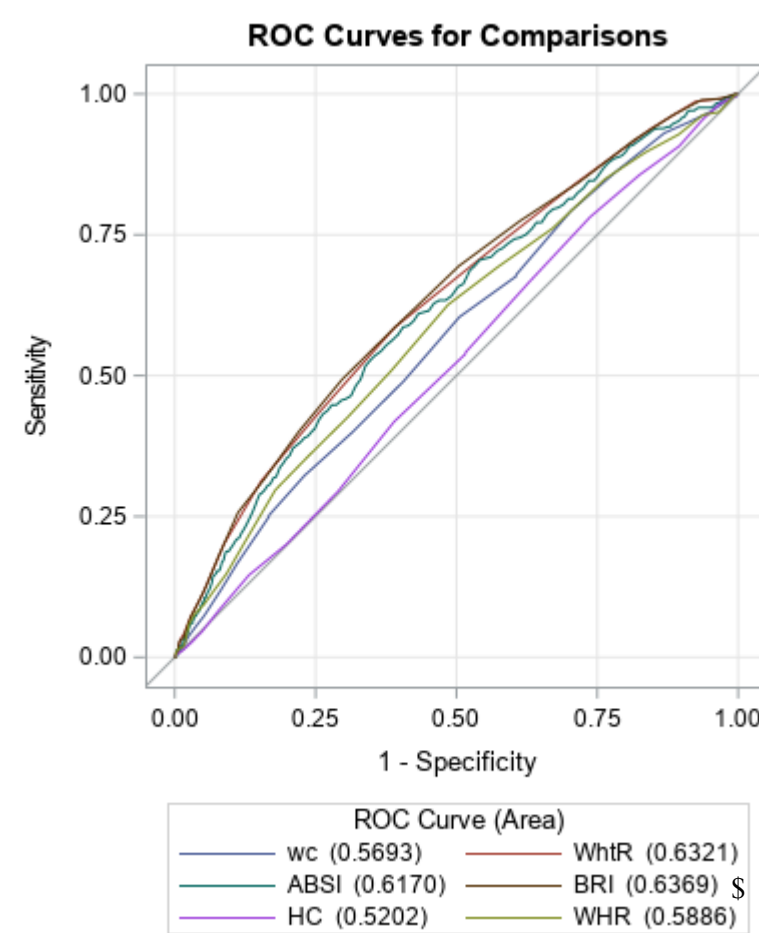Figure S5. Association between CVD risk factors and anthropometric indices among obese Chinese *

* association was adjusted for age, smoking, and drinking status and index at <Q1 level was treated as non-exposed;

Abbreviation: Q1, first quartile, the 25th percentile; Q2: second quartile, median; Q3, third quartile, the 75th percentile; WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.
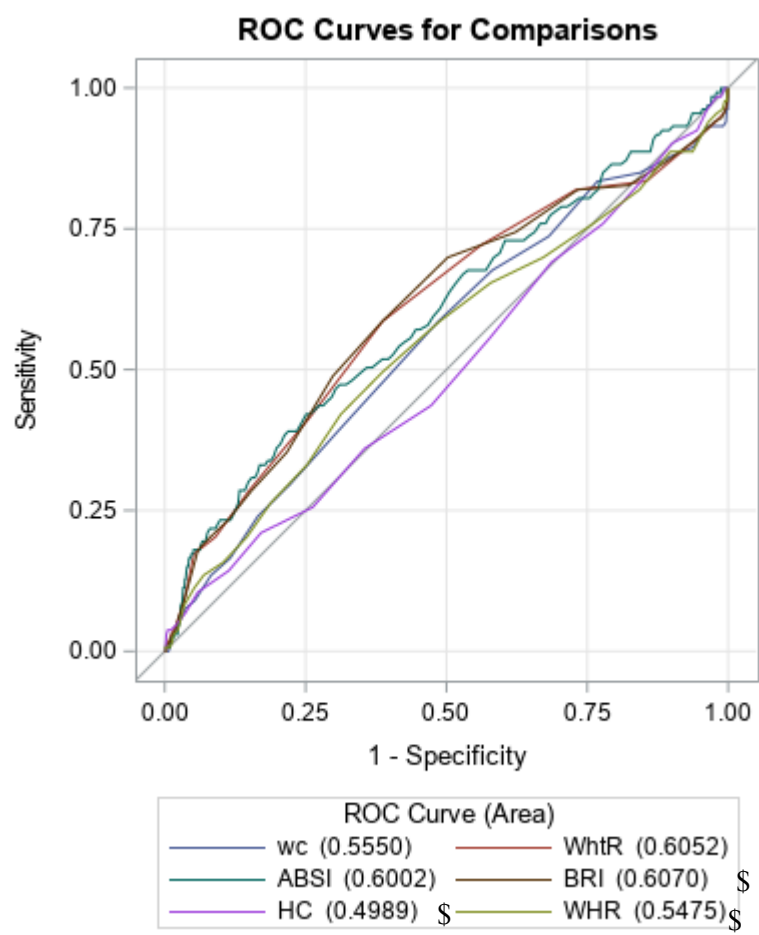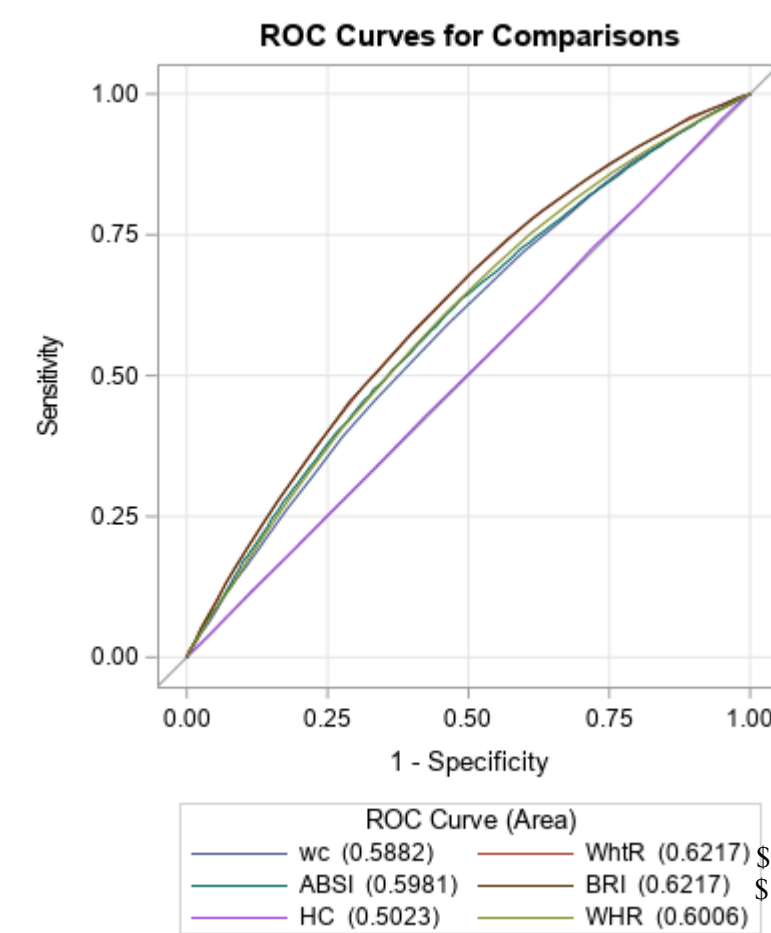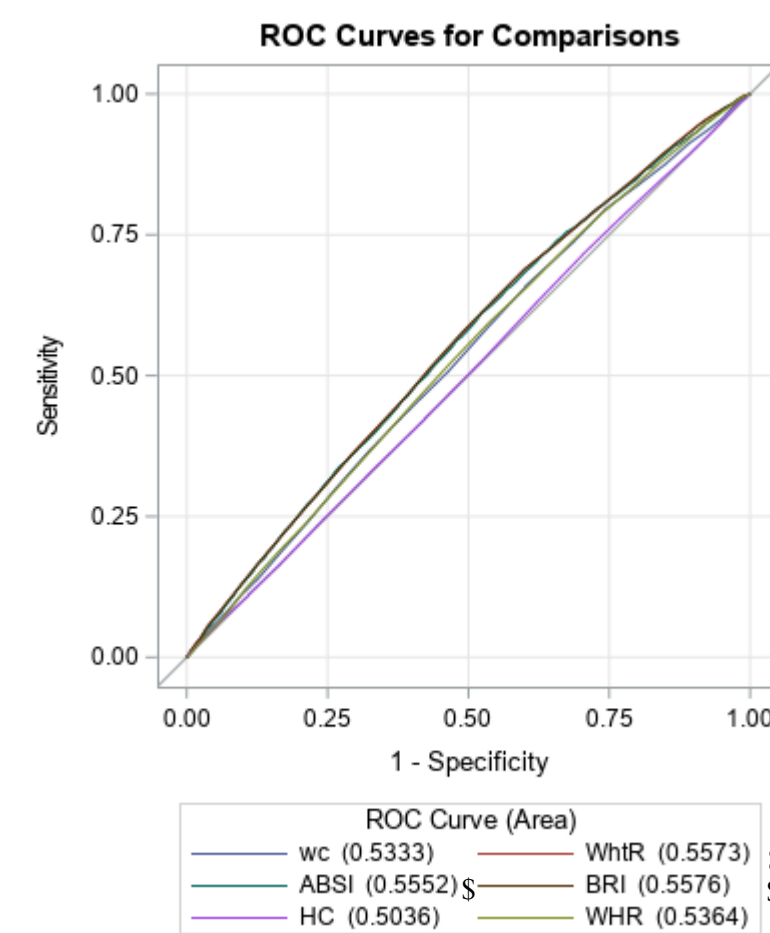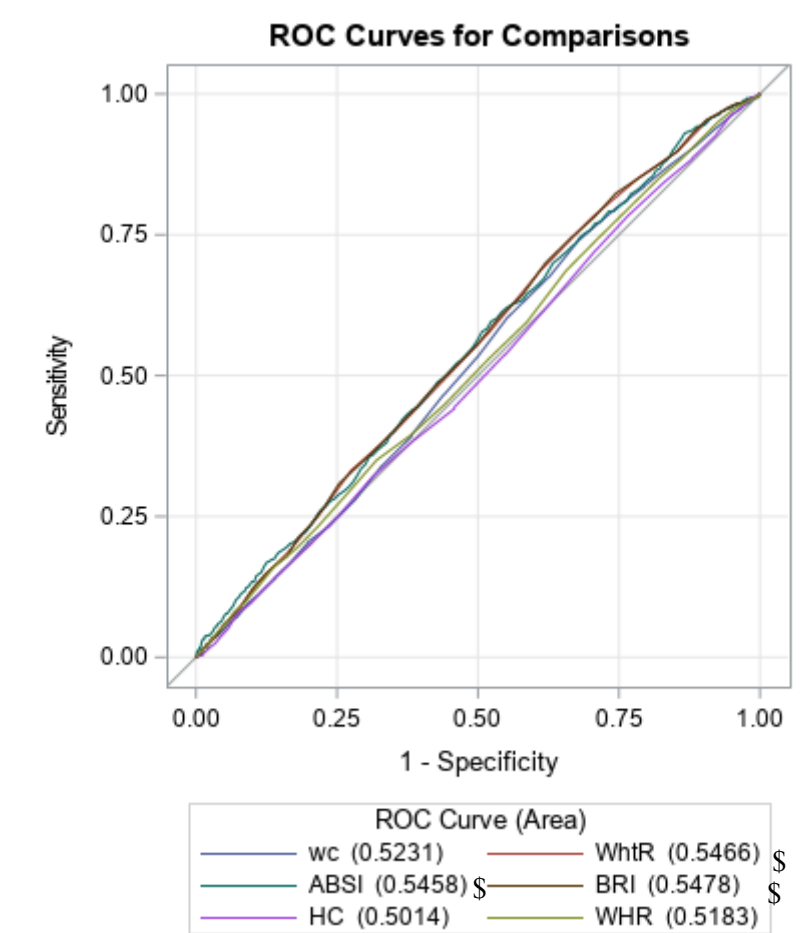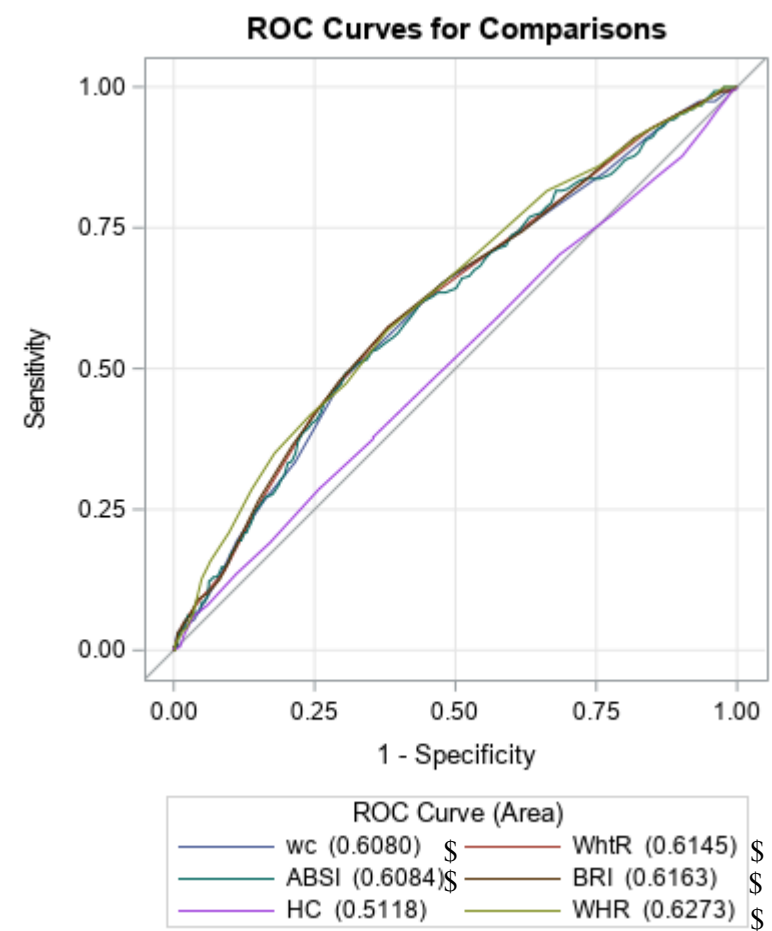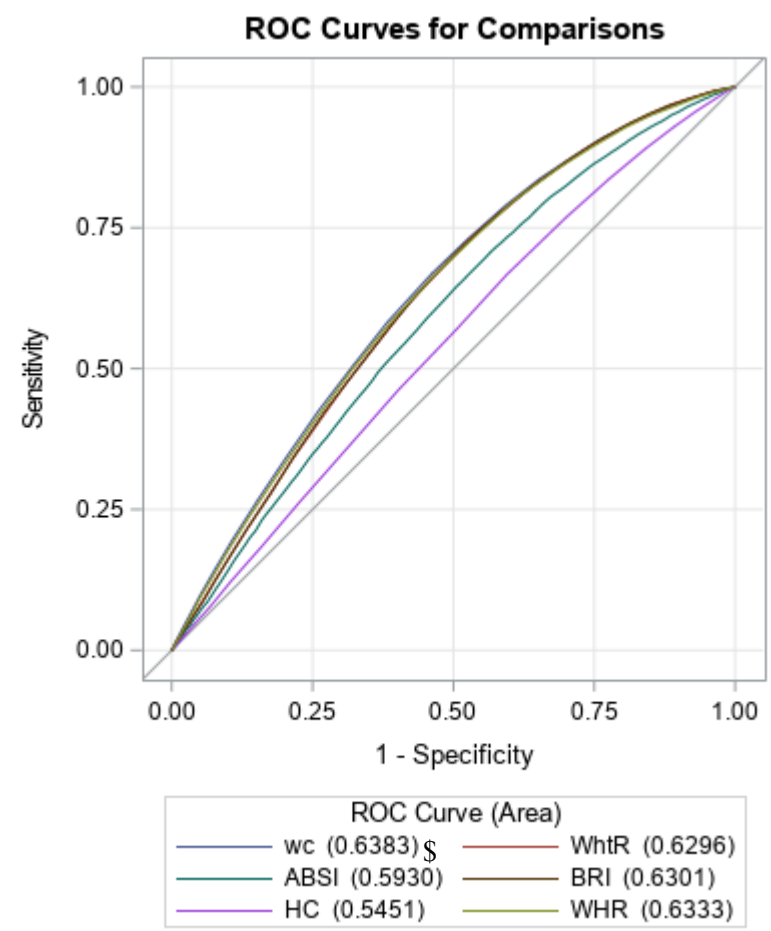
Figure S6. Comparison on area under curves for diagnosing hypercholesterolemia between different waist and hip indices within each BMI category

* Comparison on the area under different indices curves was based on Delong test; \$ mean that AUROC of those indices were similar to each other (*P*>0.05) for identifying hypercholesterolemia within the specific BMI category, and meanwhile their AUROC were the highest in the six anthropometric indices(*P*<0.05).

Abbreviation: AUROC, area under receiver operator curves; ROC, receiver operator curves; BMI, body mass index;WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.
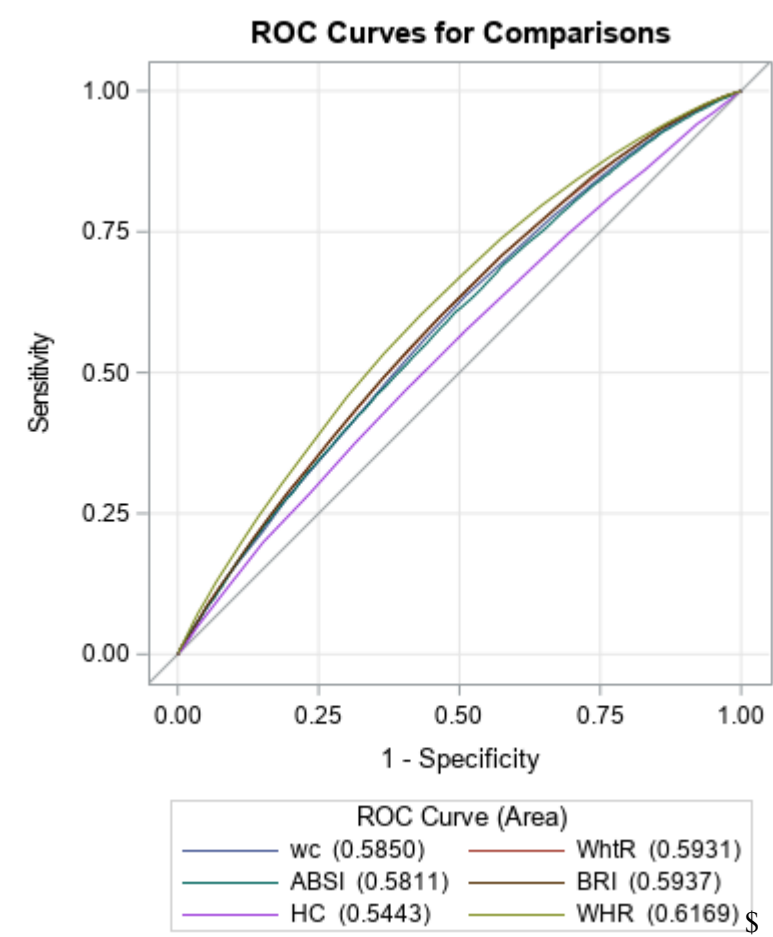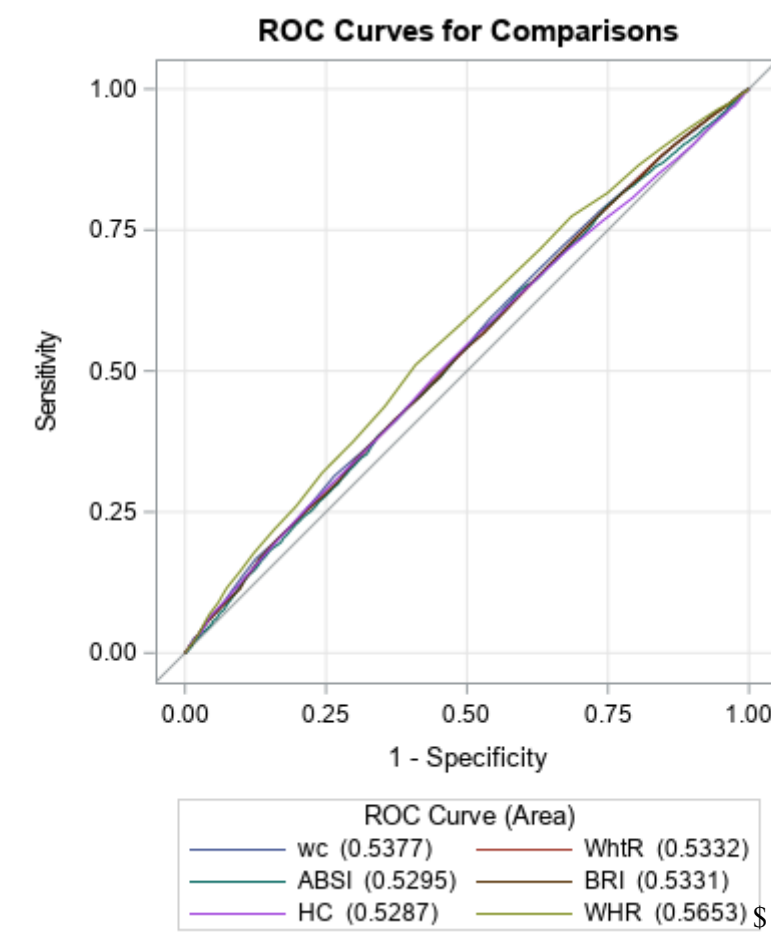
Figure S7. Comparison on area under curves for diagnosing hypertriglyceridemia between different waist and hip indices within each BMI category

* Comparison on the area under different indices curves was based on Delong test; $ mean that AUROC of those indices were similar to each other (*P*>0.05) for identifying hypertriglyceridemia within the specific BMI category, and meanwhile their AUROC were the highest in the six anthropometric indices(*P*<0.05).
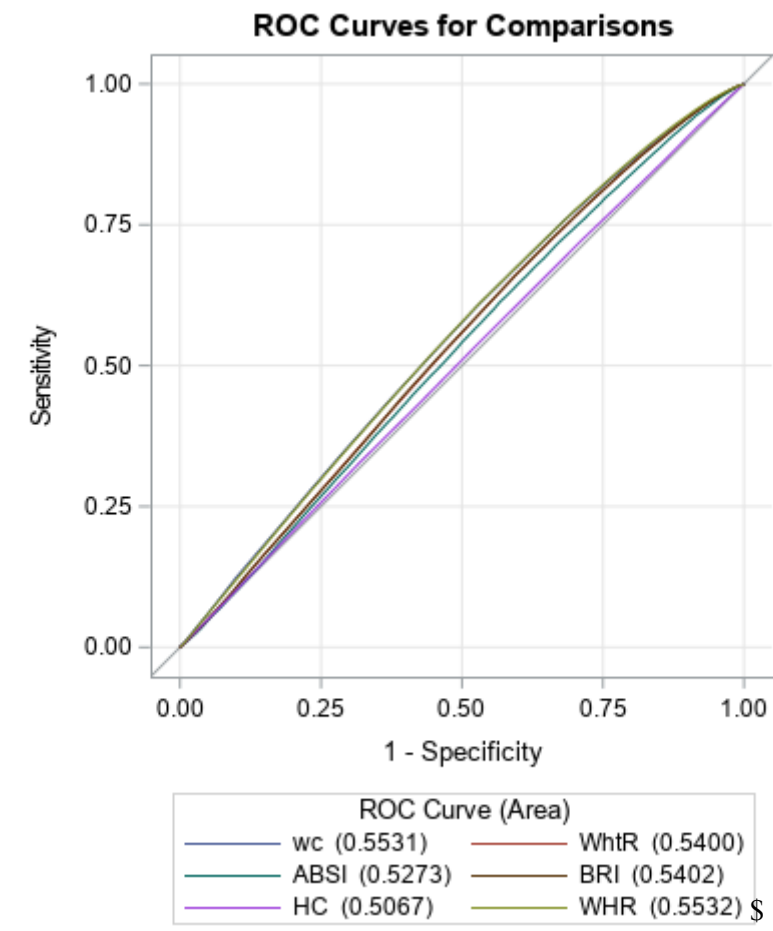
Abbreviation: AUROC, area under receiver operator curves; ROC, receiver operator curves; BMI, body mass index;WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.

Figure S8. Comparison on area under curves for diagnosing mixed hyperlipidemia between different waist and hip indices within each BMI category

* Comparison on the area under different indices curves was based on Delong test; $ mean that AUROC of those indices were similar to each other (*P*>0.05) for identifying mixed hyperlipidemia within the specific BMI category, and meanwhile their AUROC were the highest in the six anthropometric indices(*P*<0.05).

Abbreviation: AUROC, area under receiver operator curves; ROC, receiver operator curves; BMI, body mass index;WC, waist circumference; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumference; WHR, waist hip ratio.
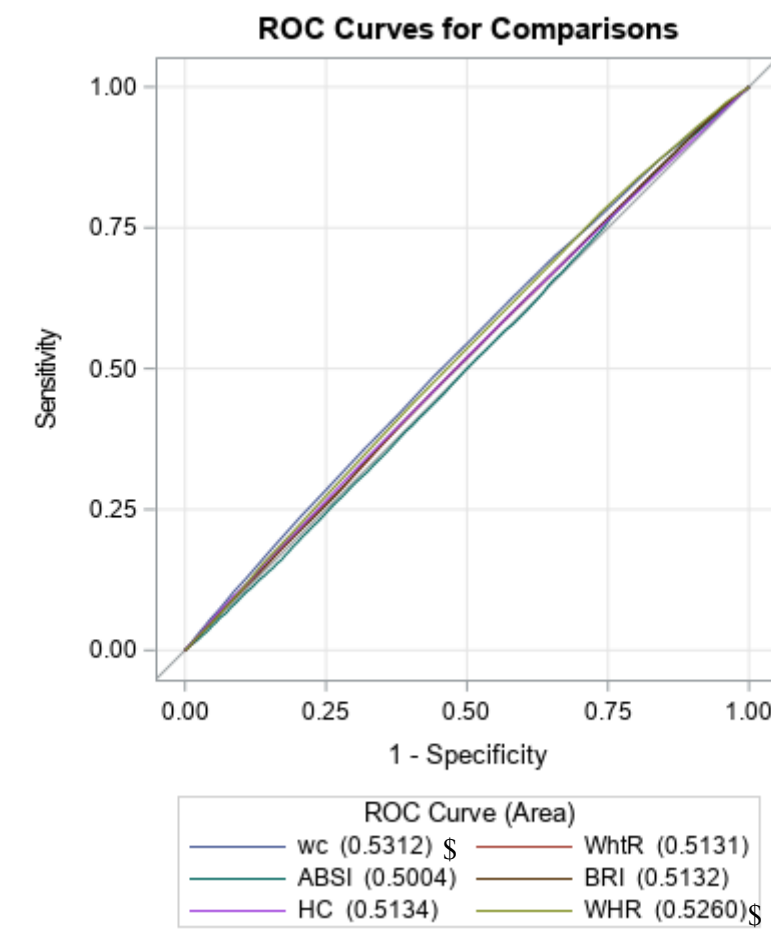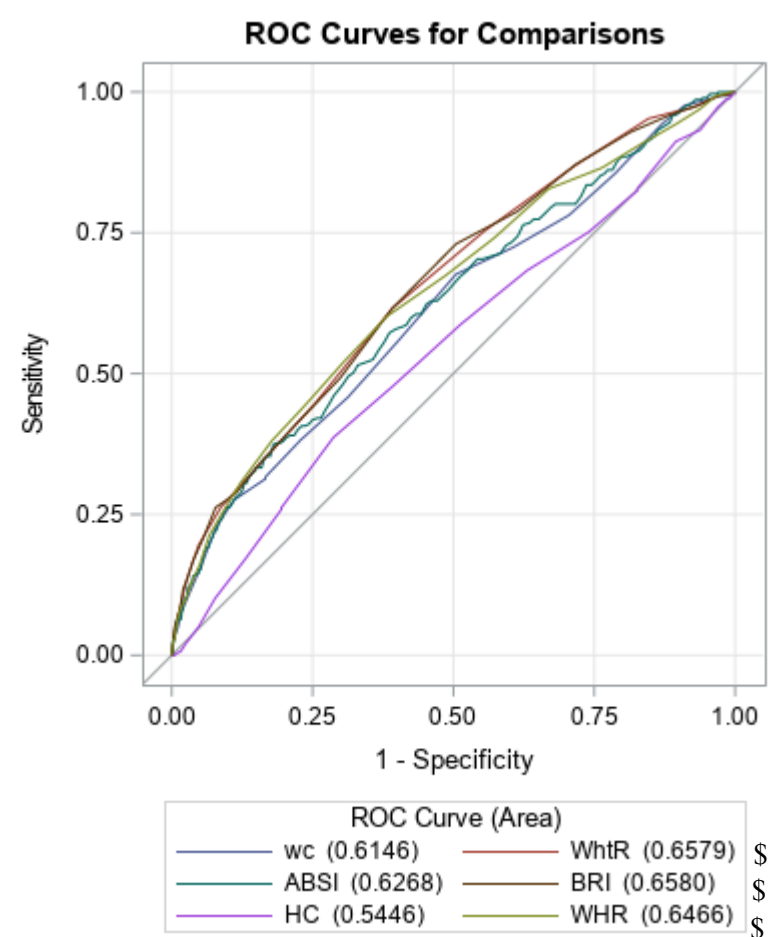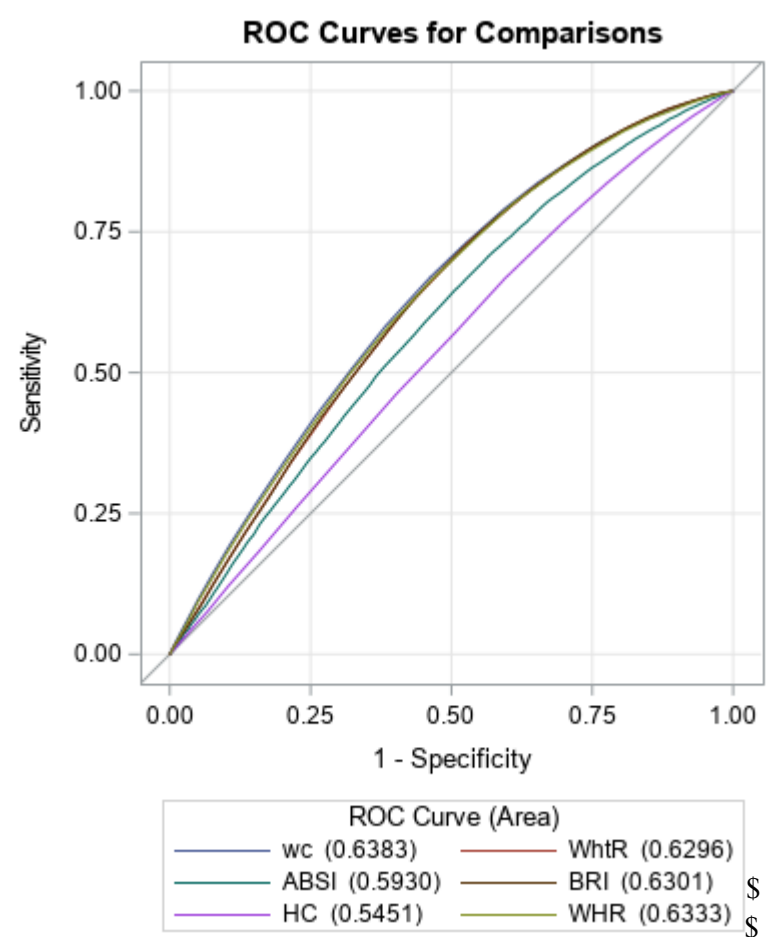
Figure S9. Comparison on area under curves for diagnosing dyslipidemia between different waist and hip indices within each BMI category

* Comparison on the area under different indices curves was based on Delong test; $ mean that AUROC of those indices were similar to each other (*P*>0.05) for identifying dyslipidemia within the specific BMI category, and meanwhile their AUROC were the highest in the six anthropometric indices(*P*<0.05).

Abbreviation: AUROC, area under receiver operator curves; ROC, receiver operator curves; BMI, body mass index;WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.
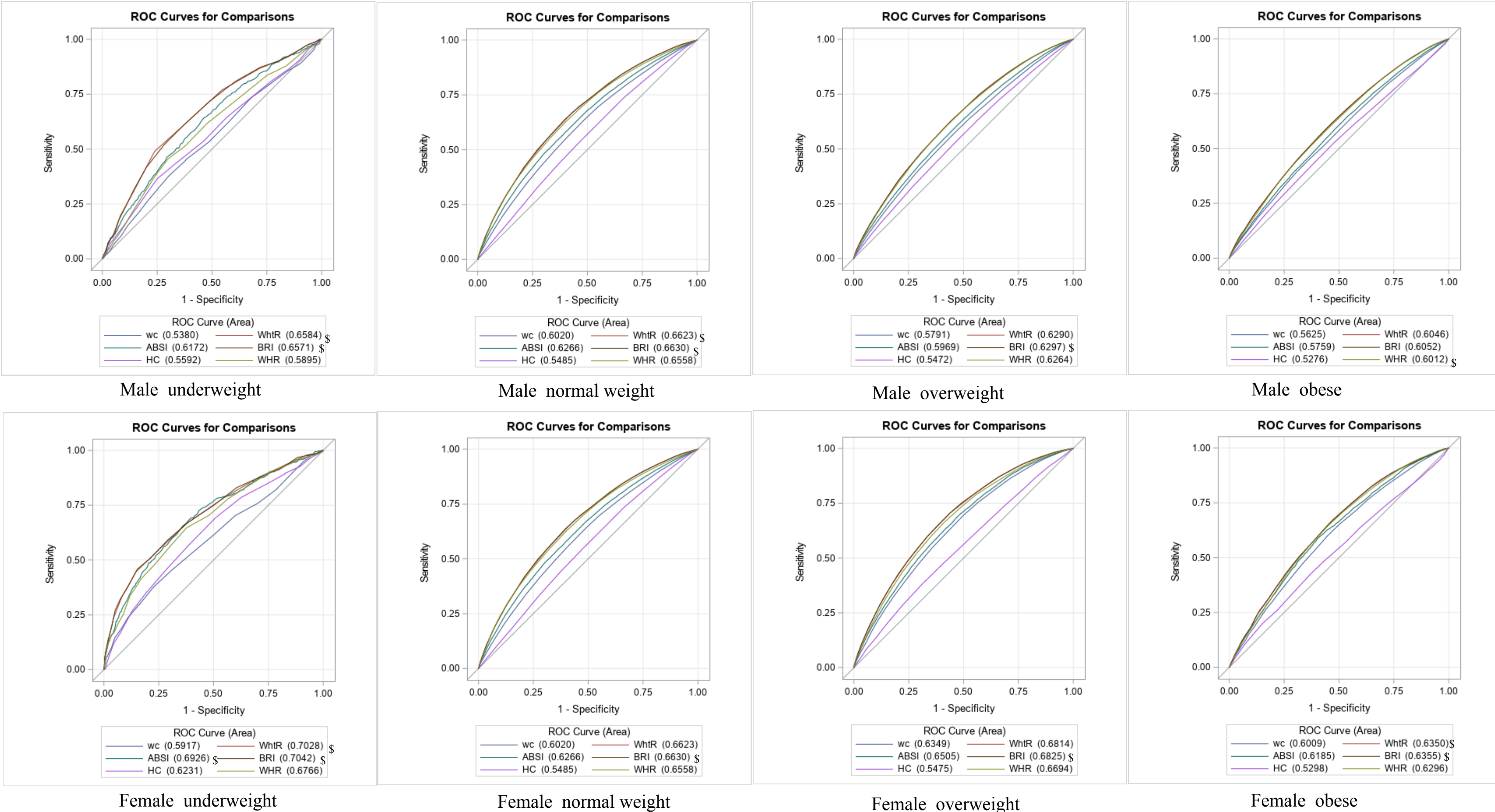
Figure S10. Comparison on area under curves for diagnosing hypertension between different waist and hip indices within each BMI category

* Comparison on the area under different indices curves was based on Delong test; $ mean that AUROC of those indices were similar to each other (*P*>0.05) for identifying hypertension within the specific BMI category, and meanwhile their AUROC were the highest in the six anthropometric indices(*P*<0.05).

Abbreviation: AUROC, area under receiver operator curves; ROC, receiver operator curves; BMI, body mass index;WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.
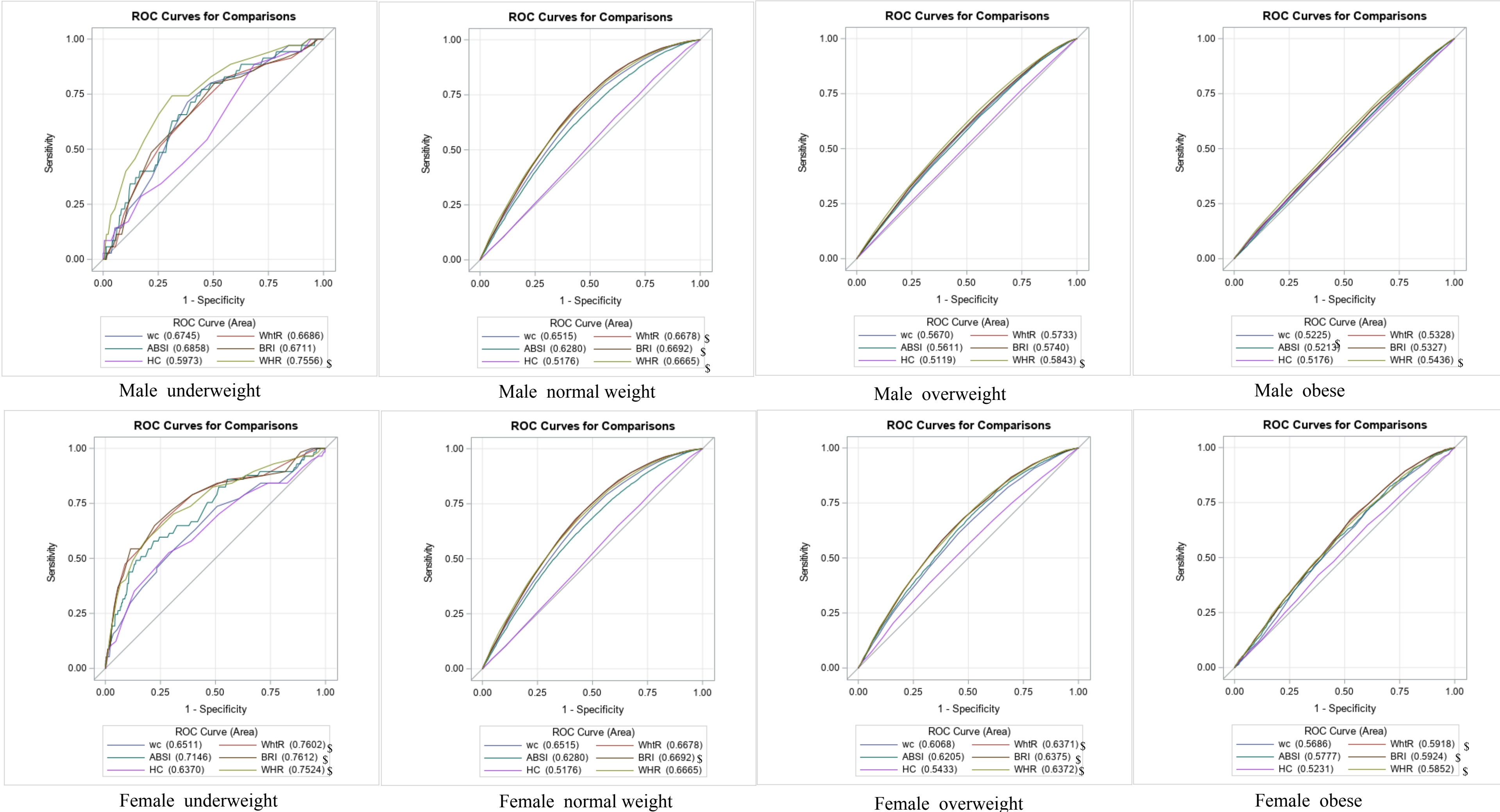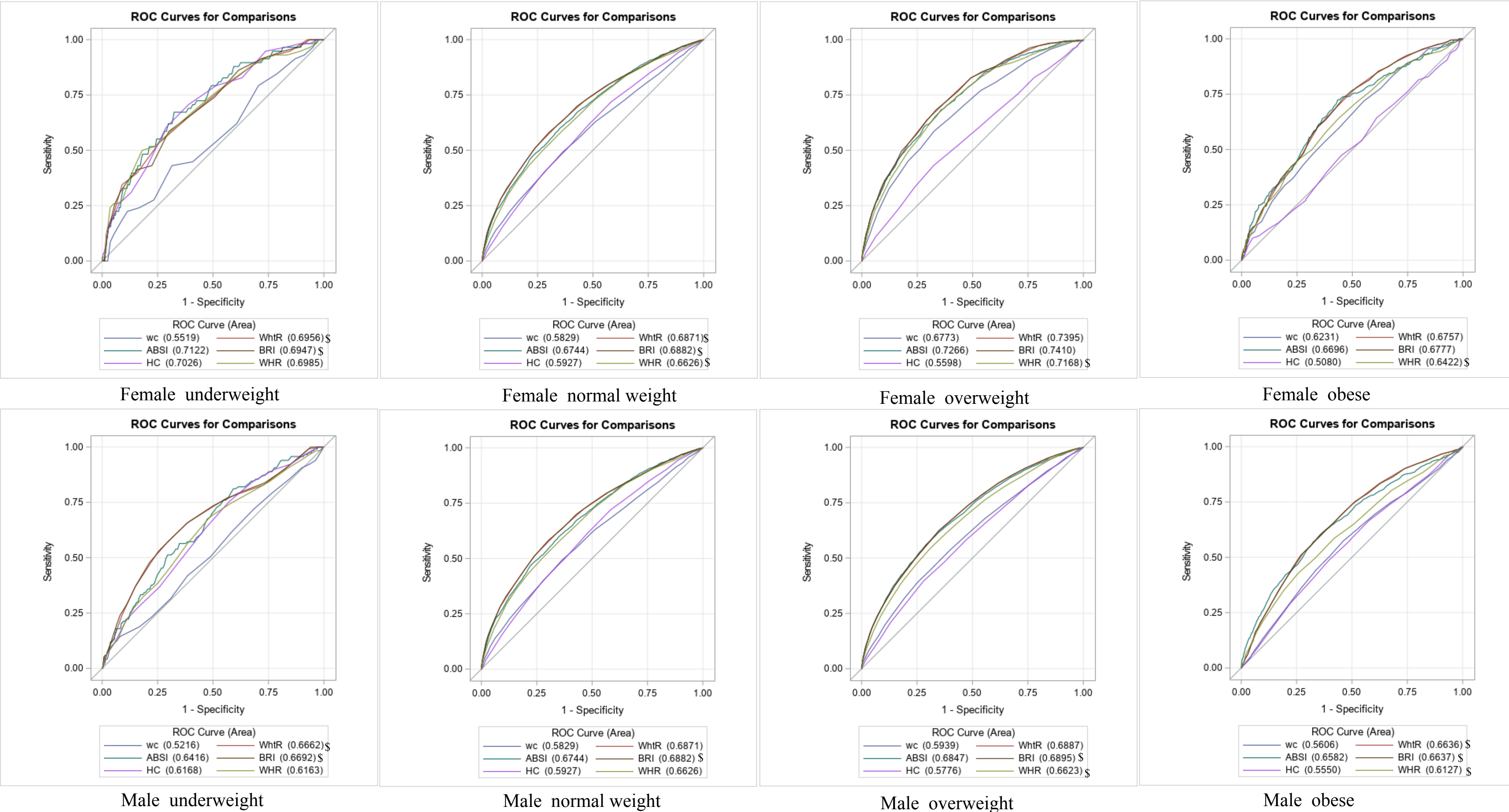
Figure S11. Comparison on area under curves for diagnosing chronic kidney disease between different waist and hip indices within each BMI category

* Comparison on the area under different indices curves was based on Delong test; $ mean that AUROC of those indices were similar to each other (*P*>0.05) for identifying chronic kidney disease within the specific BMI category, and meanwhile their AUROC were the highest in the six anthropometric indices(*P*<0.05).

Abbreviation: AUROC, area under receiver operator curves; ROC, receiver operator curves; BMI, body mass index;WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.
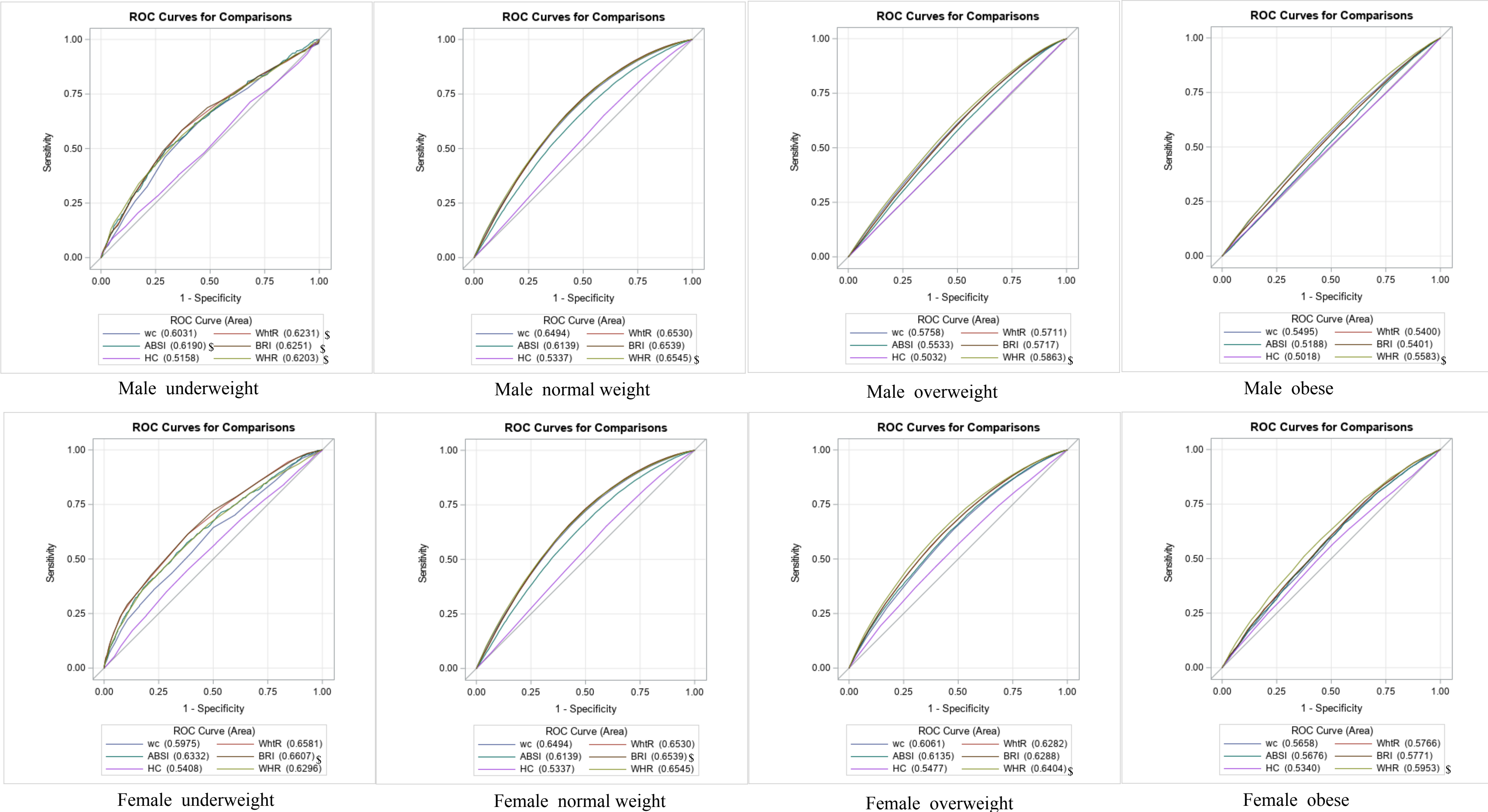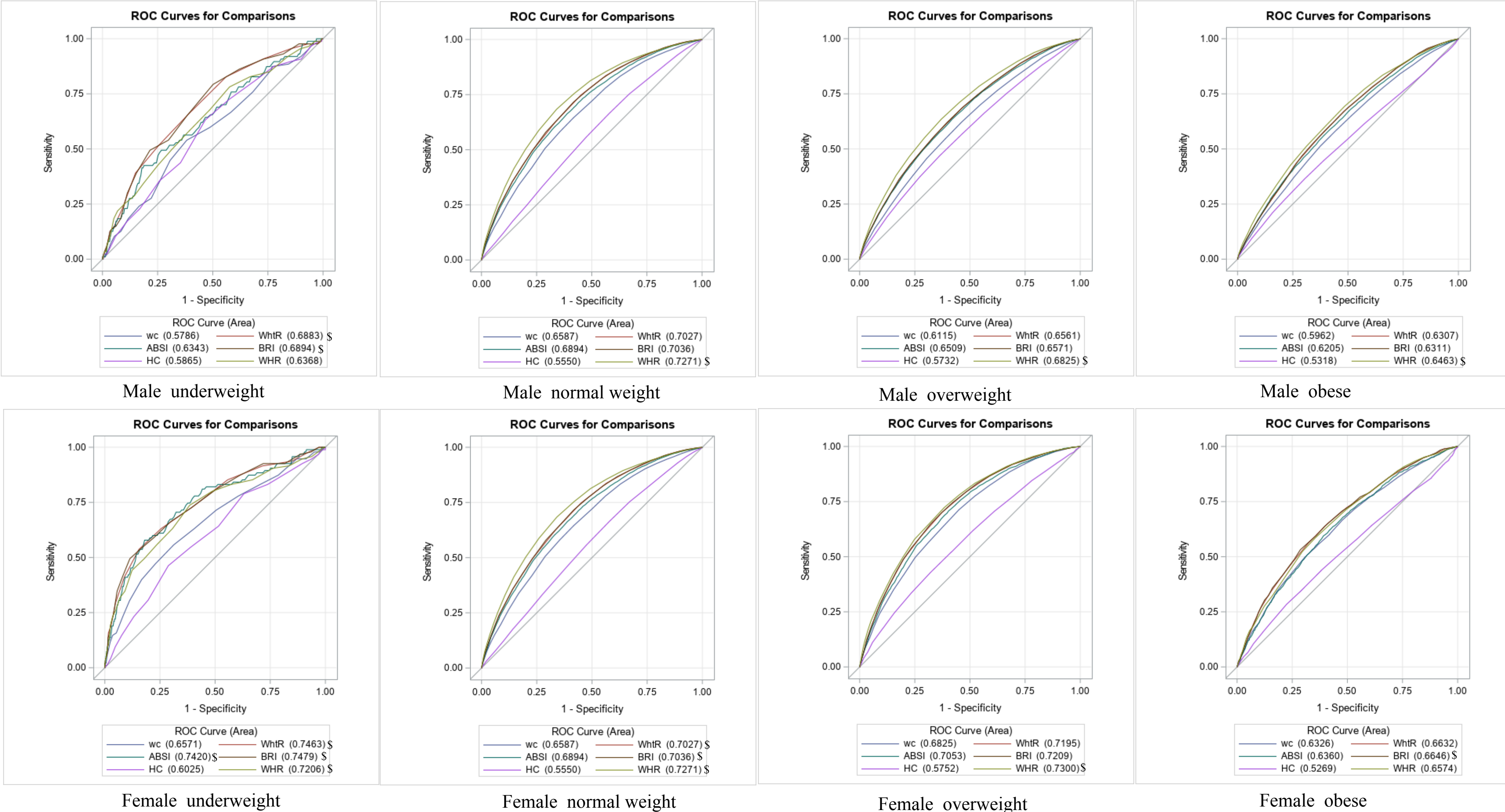
Figure S12. Comparison on area under curves for diagnosing diabetic mellitus between different waist and hip indices within each BMI category

* Comparison on the area under different indices curves was based on Delong test; $ mean that AUROC of those indices were similar to each other (*P*>0.05) for identifying diabetic mellitus within the specific BMI category, and meanwhile their AUROC were the highest in the six anthropometric indices(*P*<0.05).

Abbreviation: AUROC, area under receiver operator curves; ROC, receiver operator curves; BMI, body mass index; WC, waist circumstance; WHtR, waist height ratio; ABSI, a body shape index; BRI, body round index; HC, hip circumstance; WHR, waist hip ratio.

Waist circumstance(CM)

Height(CM)	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112
146	1.841	2.055	2.276	2.504	2.739	2.982	3.231	3.488	3.752	4.024	4.302	4.588	4.882	5.182	5.490	5.805	6.128	6.458	6.795	7.140	7.492	7.852	8.219	8.594	8.977	9.366	9.764
148	1.756	1.964	2.179	2.401	2.630	2.866	3.109	3.359	3.616	3.880	4.151	4.429	4.714	5.007	5.306	5.613	5.926	6.247	6.576	6.911	7.254	7.603	7.961	8.325	8.697	9.076	9.462
150	1.675	1.877	2.087	2.303	2.525	2.755	2.991	3.235	3.485	3.742	4.005	4.276	4.554	4.838	5.129	5.428	5.733	6.045	6.365	6.691	7.024	7.365	7.712	8.067	8.428	8.797	9.173
152	1.597	1.794	1.998	2.208	2.425	2.648	2.879	3.115	3.359	3.609	3.866	4.129	4.399	4.676	4.960	5.250	5.548	5.851	6.162	6.480	6.804	7.136	7.474	7.819	8.171	8.530	8.895
154	1.522	1.714	1.912	2.117	2.328	2.546	2.770	3.001	3.238	3.481	3.731	3.988	4.251	4.521	4.797	5.080	5.369	5.665	5.968	6.277	6.593	6.915	7.245	7.580	7.923	8.273	8.629
156	1.449	1.637	1.830	2.029	2.235	2.447	2.666	2.891	3.122	3.359	3.602	3.852	4.109	4.371	4.640	4.916	5.198	5.486	5.781	6.082	6.390	6.704	7.024	7.351	7.685	8.025	8.372
158	1.380	1.562	1.751	1.945	2.146	2.353	2.566	2.785	3.010	3.241	3.478	3.722	3.972	4.228	4.490	4.758	5.033	5.314	5.601	5.894	6.194	6.500	6.813	7.131	7.456	7.788	8.126
160	1.313	1.491	1.675	1.864	2.060	2.262	2.469	2.682	2.902	3.127	3.359	3.596	3.840	4.089	4.345	4.606	4.874	5.148	5.428	5.714	6.006	6.304	6.609	6.919	7.236	7.559	7.889
162	1.249	1.422	1.601	1.786	1.977	2.174	2.376	2.584	2.798	3.018	3.244	3.475	3.713	3.956	4.205	4.460	4.721	4.988	5.261	5.540	5.825	6.116	6.413	6.715	7.024	7.339	7.660
164	1.187	1.356	1.531	1.711	1.897	2.089	2.287	2.490	2.698	2.913	3.133	3.359	3.590	3.828	4.071	4.320	4.574	4.835	5.101	5.373	5.651	5.934	6.224	6.519	6.820	7.127	7.440
166	1.127	1.292	1.463	1.639	1.820	2.008	2.200	2.398	2.602	2.811	3.026	3.247	3.472	3.704	3.941	4.184	4.432	4.686	4.946	5.211	5.483	5.759	6.042	6.330	6.624	6.923	7.229
168	1.069	1.231	1.397	1.569	1.746	1.929	2.117	2.310	2.509	2.713	2.923	3.138	3.359	3.585	3.816	4.053	4.296	4.544	4.797	5.056	5.320	5.591	5.866	6.147	6.434	6.726	7.024
170	1.014	1.171	1.334	1.502	1.675	1.853	2.037	2.226	2.420	2.619	2.824	3.034	3.249	3.470	3.696	3.927	4.164	4.406	4.653	4.906	5.164	5.428	5.697	5.971	6.251	6.537	6.827
172	0.960	1.114	1.273	1.437	1.606	1.780	1.959	2.144	2.333	2.528	2.728	2.933	3.143	3.359	3.579	3.805	4.037	4.273	4.514	4.761	5.013	5.271	5.534	5.802	6.075	6.353	6.637
174	0.908	1.059	1.214	1.374	1.539	1.709	1.884	2.065	2.250	2.440	2.635	2.836	3.041	3.252	3.467	3.688	3.914	4.145	4.381	4.622	4.868	5.119	5.376	5.638	5.905	6.177	6.454
176	0.858	1.005	1.157	1.313	1.475	1.641	1.812	1.988	2.169	2.355	2.546	2.742	2.942	3.148	3.359	3.574	3.795	4.021	4.251	4.487	4.727	4.973	5.224	5.479	5.740	6.006	6.277
178	0.810	0.953	1.102	1.255	1.412	1.575	1.742	1.914	2.091	2.273	2.460	2.651	2.847	3.048	3.254	3.465	3.680	3.901	4.126	4.356	4.592	4.832	5.077	5.326	5.581	5.841	6.106
180	0.763	0.903	1.048	1.198	1.352	1.511	1.675	1.843	2.016	2.194	2.376	2.563	2.755	2.952	3.153	3.359	3.570	3.785	4.005	4.230	4.460	4.695	4.934	5.179	5.428	5.682	5.941
182	0.718	0.855	0.997	1.143	1.294	1.449	1.609	1.774	1.943	2.117	2.295	2.478	2.666	2.858	3.055	3.256	3.462	3.673	3.889	4.109	4.333	4.563	4.797	5.036	5.279	5.528	5.781
184	0.674	0.808	0.947	1.090	1.238	1.390	1.546	1.707	1.873	2.043	2.217	2.396	2.580	2.768	2.960	3.157	3.359	3.565	3.776	3.991	4.211	4.435	4.664	4.898	5.136	5.379	5.626
186	0.632	0.763	0.899	1.039	1.183	1.332	1.485	1.643	1.805	1.971	2.142	2.317	2.496	2.680	2.869	3.061	3.259	3.460	3.666	3.877	4.092	4.311	4.536	4.764	4.997	5.235	5.477
188	0.591	0.719	0.852	0.989	1.131	1.276	1.426	1.580	1.739	1.901	2.068	2.240	2.415	2.595	2.780	2.968	3.161	3.359	3.561	3.767	3.977	4.192	4.411	4.635	4.863	5.095	5.332
190	0.551	0.677	0.807	0.941	1.079	1.222	1.369	1.520	1.675	1.834	1.998	2.165	2.337	2.513	2.694	2.879	3.067	3.261	3.458	3.660	3.866	4.076	4.291	4.509	4.732	4.960	5.192

1.8≤BRI<3.0   3.0≤BRI<3.9   3.9≤BRI<5.0   BRI≥5.0

Figure S13. Body roundness index chart for high risk CVDRFs identification among male

BRI cut-off by BMI catergory for high risk CVDRFs identification among male :underweight(BMI<18.5) BRI≥1.8; normal weight(18.5≤BMI<24) BRI≥3.0;
overweight (24≤BMI<28) BRI≥3.9; Obese (BMI≥28) BRI≥5.0

Waist circumstance(CM)

Height(CM)	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110	112
146	1.841	2.055	2.276	2.504	2.739	2.982	3.231	3.488	3.752	4.024	4.302	4.588	4.882	5.182	5.490	5.805	6.128	6.458	6.795	7.140	7.492	7.852	8.219	8.594	8.977	9.366	9.764
148	1.756	1.964	2.179	2.401	2.630	2.866	3.109	3.359	3.616	3.880	4.151	4.429	4.714	5.007	5.306	5.613	5.926	6.247	6.576	6.911	7.254	7.603	7.961	8.325	8.697	9.076	9.462
150	1.675	1.877	2.087	2.303	2.525	2.755	2.991	3.235	3.485	3.742	4.005	4.276	4.554	4.838	5.129	5.428	5.733	6.045	6.365	6.691	7.024	7.365	7.712	8.067	8.428	8.797	9.173
152	1.597	1.794	1.998	2.208	2.425	2.648	2.879	3.115	3.359	3.609	3.866	4.129	4.399	4.676	4.960	5.250	5.548	5.851	6.162	6.480	6.804	7.136	7.474	7.819	8.171	8.530	8.895
154	1.522	1.714	1.912	2.117	2.328	2.546	2.770	3.001	3.238	3.481	3.731	3.988	4.251	4.521	4.797	5.080	5.369	5.665	5.968	6.277	6.593	6.915	7.245	7.580	7.923	8.273	8.629
156	1.449	1.637	1.830	2.029	2.235	2.447	2.666	2.891	3.122	3.359	3.602	3.852	4.109	4.371	4.640	4.916	5.198	5.486	5.781	6.082	6.390	6.704	7.024	7.351	7.685	8.025	8.372
158	1.380	1.562	1.751	1.945	2.146	2.353	2.566	2.785	3.010	3.241	3.478	3.722	3.972	4.228	4.490	4.758	5.033	5.314	5.601	5.894	6.194	6.500	6.813	7.131	7.456	7.788	8.126
160	1.313	1.491	1.675	1.864	2.060	2.262	2.469	2.682	2.902	3.127	3.359	3.596	3.840	4.089	4.345	4.606	4.874	5.148	5.428	5.714	6.006	6.304	6.609	6.919	7.236	7.559	7.889
162	1.249	1.422	1.601	1.786	1.977	2.174	2.376	2.584	2.798	3.018	3.244	3.475	3.713	3.956	4.205	4.460	4.721	4.988	5.261	5.540	5.825	6.116	6.413	6.715	7.024	7.339	7.660
164	1.187	1.356	1.531	1.711	1.897	2.089	2.287	2.490	2.698	2.913	3.133	3.359	3.590	3.828	4.071	4.320	4.574	4.835	5.101	5.373	5.651	5.934	6.224	6.519	6.820	7.127	7.440
166	1.127	1.292	1.463	1.639	1.820	2.008	2.200	2.398	2.602	2.811	3.026	3.247	3.472	3.704	3.941	4.184	4.432	4.686	4.946	5.211	5.483	5.759	6.042	6.330	6.624	6.923	7.229
168	1.069	1.231	1.397	1.569	1.746	1.929	2.117	2.310	2.509	2.713	2.923	3.138	3.359	3.585	3.816	4.053	4.296	4.544	4.797	5.056	5.320	5.591	5.866	6.147	6.434	6.726	7.024
170	1.014	1.171	1.334	1.502	1.675	1.853	2.037	2.226	2.420	2.619	2.824	3.034	3.249	3.470	3.696	3.927	4.164	4.406	4.653	4.906	5.164	5.428	5.697	5.971	6.251	6.537	6.827
172	0.960	1.114	1.273	1.437	1.606	1.780	1.959	2.144	2.333	2.528	2.728	2.933	3.143	3.359	3.579	3.805	4.037	4.273	4.514	4.761	5.013	5.271	5.534	5.802	6.075	6.353	6.637
174	0.908	1.059	1.214	1.374	1.539	1.709	1.884	2.065	2.250	2.440	2.635	2.836	3.041	3.252	3.467	3.688	3.914	4.145	4.381	4.622	4.868	5.119	5.376	5.638	5.905	6.177	6.454
176	0.858	1.005	1.157	1.313	1.475	1.641	1.812	1.988	2.169	2.355	2.546	2.742	2.942	3.148	3.359	3.574	3.795	4.021	4.251	4.487	4.727	4.973	5.224	5.479	5.740	6.006	6.277
178	0.810	0.953	1.102	1.255	1.412	1.575	1.742	1.914	2.091	2.273	2.460	2.651	2.847	3.048	3.254	3.465	3.680	3.901	4.126	4.356	4.592	4.832	5.077	5.326	5.581	5.841	6.106
180	0.763	0.903	1.048	1.198	1.352	1.511	1.675	1.843	2.016	2.194	2.376	2.563	2.755	2.952	3.153	3.359	3.570	3.785	4.005	4.230	4.460	4.695	4.934	5.179	5.428	5.682	5.941
182	0.718	0.855	0.997	1.143	1.294	1.449	1.609	1.774	1.943	2.117	2.295	2.478	2.666	2.858	3.055	3.256	3.462	3.673	3.889	4.109	4.333	4.563	4.797	5.036	5.279	5.528	5.781
184	0.674	0.808	0.947	1.090	1.238	1.390	1.546	1.707	1.873	2.043	2.217	2.396	2.580	2.768	2.960	3.157	3.359	3.565	3.776	3.991	4.211	4.435	4.664	4.898	5.136	5.379	5.626
186	0.632	0.763	0.899	1.039	1.183	1.332	1.485	1.643	1.805	1.971	2.142	2.317	2.496	2.680	2.869	3.061	3.259	3.460	3.666	3.877	4.092	4.311	4.536	4.764	4.997	5.235	5.477
188	0.591	0.719	0.852	0.989	1.131	1.276	1.426	1.580	1.739	1.901	2.068	2.240	2.415	2.595	2.780	2.968	3.161	3.359	3.561	3.767	3.977	4.192	4.411	4.635	4.863	5.095	5.332
190	0.551	0.677	0.807	0.941	1.079	1.222	1.369	1.520	1.675	1.834	1.998	2.165	2.337	2.513	2.694	2.879	3.067	3.261	3.458	3.660	3.866	4.076	4.291	4.509	4.732	4.960	5.192

1.9≤BRI<2.9   3.9≤BRI<4.0   4.0≤BRI<5.2   BRI≥5.2

Figure S14. Body roundness index chart for high risk CVDRFs identification among female

BRI cut-off by BMI catergory for high risk CVDRFs identification among female: underweight(BMI<18.5) BRI≥1.9; normal weight(18.5≤BMI<24) BRI≥2.9;
overweight (24≤BMI<28) BRI≥4.0; Obese (BMI≥28) BRI≥5.2