

# SUPPLEMENTARY DATA

**Supplementary Table 1.** Relationship between WC-IC and WC-mid and metabolic variables in subjects without medications.

	Men			Women		
	number	WC-IC	WC-mid	Number	WC-IC	WC-mid
Systolic blood pressure <sup>a</sup>	623	0.23*	0.27*†	994	0.34*	0.39*†
Diastolic blood pressure <sup>a</sup>	623	0.26*	0.28*	994	0.32*	0.35*
Fasting plasma glucose <sup>b</sup>	737	0.07*	0.15*†	1127	0.18*	0.24*†
OGTT 2-hour plasma glucose <sup>b</sup>	736	0.16*	0.22*†	1119	0.25*	0.29*†
Hemoglobin A1c <sup>b</sup>	737	0.15*	0.20*†	1127	0.20*	0.26*†
Total cholesterol <sup>c</sup>	731	0.04	0.05	1124	0.15*	0.16*
Triglyceride‡ <sup>c</sup>	731	0.29*	0.37*†	1124	0.28*	0.37*†
HDL-cholesterol <sup>c</sup>	731	−0.23*	−0.29*†	1124	−0.17*	−0.25*†
LDL-cholesterol <sup>c</sup>	731	0.07	0.09*	1124	0.2*	0.21*
High-sensitivity C-reactive protein‡ <sup>d</sup>	713	0.22*	0.29*†	1114	0.33*	0.42*†

WC-IC, waist circumference at the horizontal plane of the superior border of the iliac crest. WC-mid, waist circumference in the horizontal plane the midway between the lowest rib and the iliac crest.

Pearson's correlation coefficients are shown.

<sup>a</sup> Analyses in subjects without medications for hypertension.

<sup>b</sup> Analyses in subjects without medications for diabetes.

<sup>c</sup> Analyses in subjects without medications for dyslipidemia.

<sup>d</sup> Analyses in subjects without medications for diabetes and dyslipidemia.

\*  $p < 0.05$  for the relationship between WC-IC or WC-mid and metabolic variables.

†  $p < 0.05$  vs. the correlation coefficients of WC-IC and metabolic variables.

‡ Variables were logarithmically transformed for the analyses.

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**Supplementary Table 2.** Performance of WC-IC and WC-mid for identifying or predicting metabolic disease in both genders.

	To identify disease		To predict disease	
AUC (95% CI)	WC-IC	WC-mid	WC-IC	WC-mid
Men				
Hypertension	0.63 (0.59–0.67)	0.64 (0.6–0.68)	0.61 (0.52–0.7)	0.61 (0.52–0.71)
Diabetes mellitus	0.62 (0.57–0.67)	0.66 (0.61–0.71)*	0.54 (0.42–0.66)	0.57 (0.44–0.7)
≥2 MS components <sup>a</sup>	0.66 (0.62–0.7)	0.70 (0.66–0.74)*	0.62 (0.53–0.71)	0.62 (0.53–0.7)
Women				
Hypertension	0.69 (0.65–0.72)	0.72 (0.68–0.75)†	0.7 (0.62–0.77)	0.65 (0.57–0.73) †
Diabetes mellitus	0.7 (0.65–0.75)	0.72 (0.68–0.77)	0.69 (0.61–0.76)	0.74 (0.67–0.81) †
≥2 MS components <sup>a</sup>	0.68 (0.65–0.72)	0.73 (0.7–0.76)*	0.65 (0.59–0.71)	0.68 (0.63–0.74)

AUC, area under the area under the receiver-operator curve (ROC); WC-IC, waist circumference in the horizontal plane at the superior border of the iliac crest; WC-mid, waist circumference in the horizontal plane midway between the lowest rib and the iliac crest.

<sup>a</sup> Clustering of 2 or more components of metabolic syndrome including fasting plasma glucose ≥100 mg/dL, blood pressure ≥130/85 mmHg, triglyceride level ≥150 mg/dL, and low HDL-cholesterol level (<40 mg/dL in men; <50 mg/dL in women). Subjects taking medications for hypertension, diabetes, or dyslipidemia were considered as meeting the corresponding criteria.

\*  $p < 0.05$  vs. AUC of WC-IC; †  $0.05 < p < 0.1$  vs. AUC of WC-IC; all  $p$  values were age-adjusted

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**Supplementary Table 3.** Different definitions of central obesity for identifying or predicting metabolic disease in both genders.

		To identify disease				To predict disease			
		WC-IC		WC-mid		WC-IC		WC-mid	
Hypertension									
Cutoff (M/F, cm)		90/80	88/83	90/80	87/78	90/80	89/84	90/80	90/77
Men	AUC (95% CI)	0.59 (0.55–0.62)	0.61 (0.57–0.64)	0.59 (0.55–0.62)	0.60 (0.57–0.64)	0.55 (0.47–0.64)	0.56 (0.47–0.64)	0.58 (0.49–0.66)	0.58 (0.49–0.66)
	Sensitivity	62%	75%	55%	71%	54%	60%	49%	49%
	Specificity	56%	46%	62%	49%	57%	52%	66%	66%
Women	AUC (95% CI)	0.62 (0.59–0.65)	0.64 (0.61–0.67)	<b>0.64*</b> <b>(0.61–0.68)</b>	0.66 (0.63–0.7)	0.61 (0.55–0.67)	0.65 (0.59–0.72)	0.61 (0.54–0.68)	0.61 (0.54–0.68)
	Sensitivity	81%	71%	60%	72%	82%	70%	48%	60%
	Specificity	43%	57%	69%	61%	40%	61%	74%	62%
Diabetes									
Cutoff (M/F, cm)		90/80	90/84	90/80	88/79	90/80	90/84	90/80	89/80
Men	AUC (95% CI)	0.61 (0.56–0.65)	0.61 (0.56–0.65)	0.62 (0.57–0.66)	0.63 (0.59–0.67)	0.56 (0.46–0.67)	0.56 (0.46–0.67)	0.57 (0.47–0.68)	0.58 (0.47–0.68)
	Sensitivity	68%	68%	64%	76%	60%	60%	52%	56%
	Specificity	53%	53%	59%	50%	53%	53%	63%	59%
Women	AUC (95% CI)	0.6 (0.56–0.64)	0.66 (0.62–0.71)	<b>0.66*</b> <b>(0.61–0.7)</b>	0.67 (0.62–0.71)	0.64 (0.59–0.69)	0.63 (0.55–0.71)	0.65 (0.57–0.74)	0.65 (0.57–0.74)
	Sensitivity	81%	75%	66%	72%	91%	69%	60%	60%
	Specificity	40%	58%	65%	61%	37%	57%	71%	71%
Clustering of 2 or more components of metabolic syndrome <sup>a</sup>									
Cutoff (M/F, cm)		90/80	89/84	90/80	89/78	90/80	91/84	90/80	85/76
Men	AUC (95% CI)	0.62 (0.58–0.65)	0.61 (0.57–0.64)	<b>0.64*</b> <b>(0.61–0.68)</b>	0.66 (0.62–0.69)	0.57 (0.5–0.65)	0.59 (0.52–0.67)	0.6 (0.53–0.67)	0.59 (0.51–0.66)
	Sensitivity	63%	56%	60%	65%	52%	49%	43%	62%
	Specificity	60%	65%	69%	66%	63%	70%	77%	56%
Women	AUC (95% CI)	0.61 (0.58–0.64)	0.64 (0.61–0.67)	<b>0.66*</b> <b>(0.63–0.69)</b>	0.67 (0.64–0.7)	0.62 (0.58–0.67)	0.6 (0.55–0.66)	0.62 (0.56–0.67)	0.64 (0.59–0.7)
	Sensitivity	78%	65%	60%	71%	81%	57%	45%	65%
	Specificity	44%	62%	71%	64%	44%	63%	78%	64%

AUC, area under the area under the receiver-operator curve (ROC); WC-IC, waist circumference in the horizontal plane of the superior border of the iliac crest; WC-mid, waist circumference in the horizontal plane midway between the lowest rib and the iliac crest.

<sup>a</sup> Clustering of 2 or more components of metabolic syndrome including fasting plasma glucose  $\geq 100$  mg/dL, blood pressure  $\geq 130/85$  mmHg, triglyceride level  $\geq 150$  mg/dL, and low HDL-C ( $< 40$  mg/dL in

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men; <50 mg/dL in women). Subjects taking medications for hypertension, diabetes, or dyslipidemia were considered as meeting the corresponding criteria.

\* Age-adjusted  $p < 0.05$  AUC of WC-mid at 90/80 vs. AUC of WC-IC at 90/80 cm.

†  $0.05 < \text{age-adjusted } p < 0.1$  AUC of WC-mid at 90/80 vs. AUC of WC-IC at 90/80 cm.