

Prevalence of Distinct Combinations of Co-morbid Diagnostic Conditions for Metabolic Syndrome in U.S. Adults Meredith E. Shapiro, William D. Johnson Pennington Biomedical Research Center, Louisiana State University System, Baton Rouge, LA. USA

INTRODUCTION

- Metabolic Syndrome (MetS) is a set of concurrent conditions associated with an increased risk of developing cardiovascular diseases and type 2 diabetes mellitus
- Although there is some debate about the criteria used to diagnose MetS, the five most widely accepted diagnostic conditions are obesity, particularly central adiposity, which typically is determined as large waist circumference (WC); low concentrations of high-density lipoprotein cholesterol (HDL-C); elevated triglyceride (TG) concentrations; elevated blood pressure (BP); and elevated fasting glucose (GLU) concentrations. A person contemporaneously having any three or more of these disorders is said to have MetS.
- A fundamental understanding of the prevalence of disorders of specific combinations of co-existing risk factors for MetS may provide insight into commonality among the undesirable biomarkers. The aim of this study was to investigate the non-overlapping prevalence of co-existing disorders among different combinations of the five component risk factors for MetS to determine the most influential diagnostic criteria in US men and women aged 20 years and older.

PURPOSE

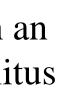
• To identify the most prevalent unique combinations of the component disorders of metabolic syndrome among adults.

METHODS

- 11,652 participants aged \geq 20 years in the National Health and Nutrition Examination Survey (NHANES), 1999-2010, constitute a representative sample of U.S. adults.
- Exclusions included those who did not participate in the mobile examination center, did not fast, were pregnant, or did not have measurements for WC, BP, GLU, HDL, or TG.
- Presence or absence of MetS was determined using the present NCEP definition.

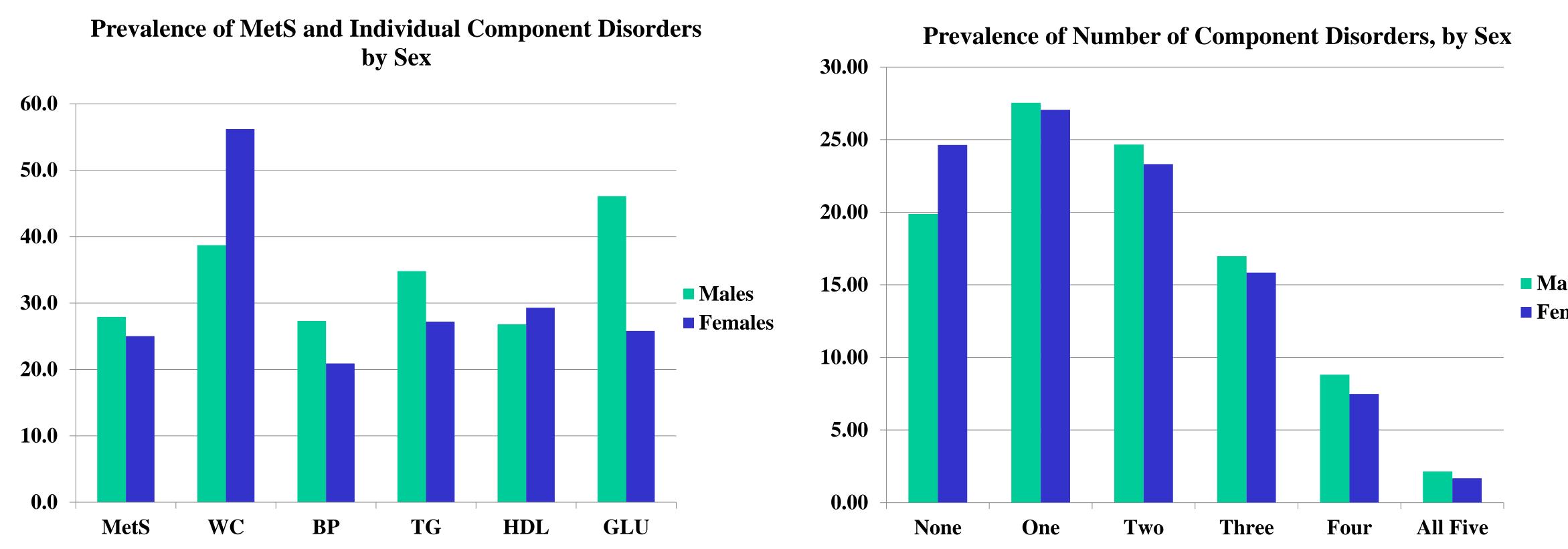
SAMPLE DEMOGRAPHICS

	No. of Adults		
Characteristic	Study Sample	Population Estimate	Popula
Total	11,652	89,668,135	
Sex			
Μ	5,653	40,809,423	45
F	5,999	48,858,713	54
Ethnicity			
Non-Hispanic White	7,542	75,976,057	84
Non-Hispanic Black	1,738	7,190,837	8.
Mexican-American	2,372	6,501,241	7.
Age group			
20-29	1,849	15,509,351	17
30-39	1,927	16,581,739	18
40-49	2,303	21,871,314	24
50-59	1,753	16,373,575	18
60-69	1,656	9,849,691	11.
70 and older	2,164	9,482,465	10

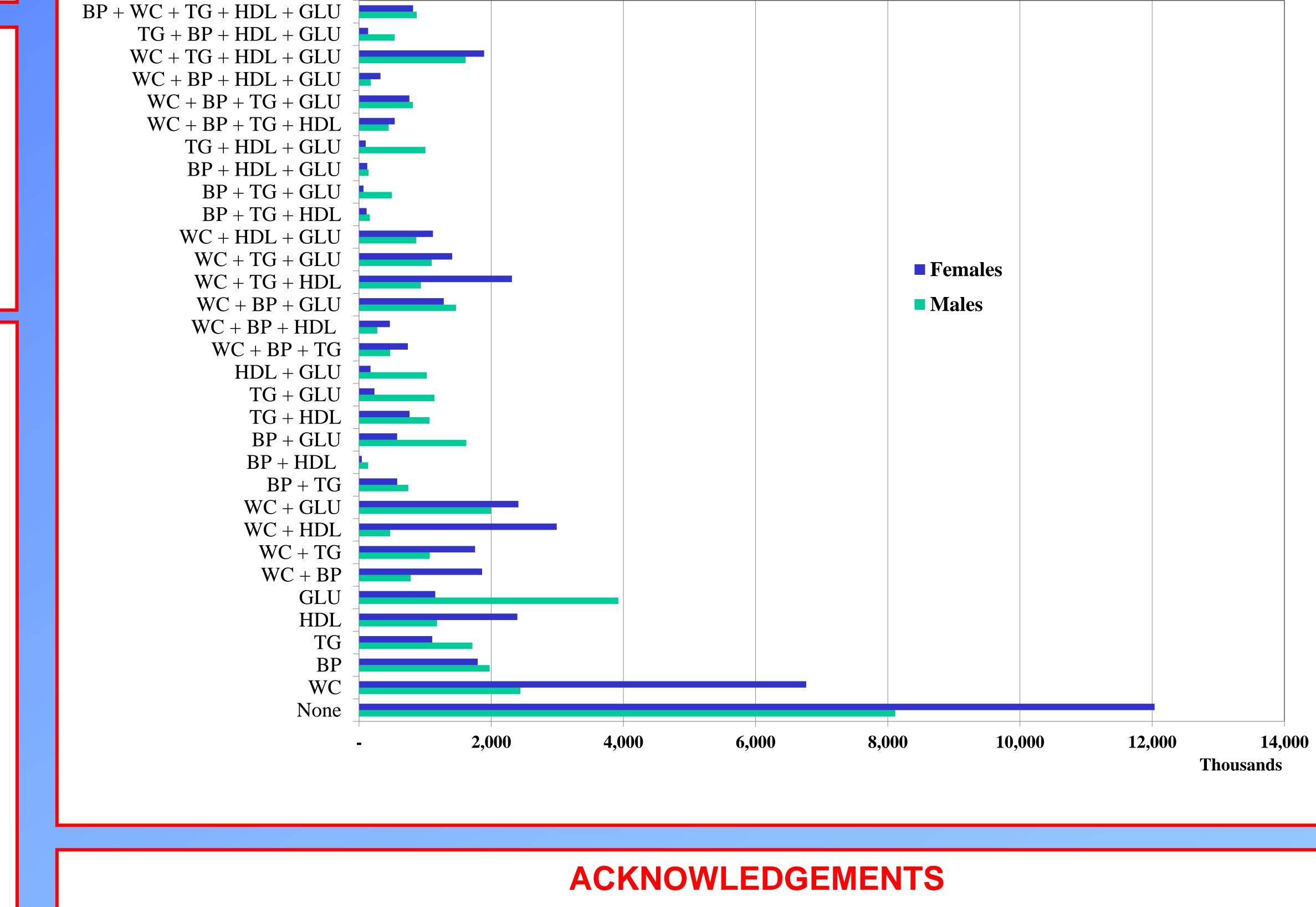


ation % 5.5

).6



Estimated Number of Adults with Each Distinct Component Combination, by Sex



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	RESULTS
	• 26.3% of U.S. adults have MetS.
	 Syndrome is most common among Mexican American women (30.9%).
	• Least common among non-Hispanic Black men (14.0%)
	 Most common individual risk factor is large waist circumference at 48.2% (Men 38.7%, Women 56.2%)
les	• The second most prevalent individual disorder is elevated GLU at 35.0% (Men 46.1%, Women 25.8%)
nales	 For those with MetS, the three most prevalent combinations of risk factors included WC:
	• $WC + TG + HDL + GLU (3.9\%)$
	• WC + TG + HDL (3.6%)
	• WC + BP + GLU (3.1%)
	• Of adults with normal waist circumference, only 6.2% had disorders in three of the other four disordered risk factors as required to be diagnosed with MetS.
	DISCUSSION
	• WC is the most common disordered risk factor for US adults, whether cumulatively or as a part of unique combinations of disorders, and few people with normal WC have MetS.
	• We conclude from these results that large waist circumference plays a key role in metabolic syndrome.
	• The WC cutpoints used to define <i>abdominal</i> obesity are different for men and women but the same BMI cutpoint is used to define <i>overall</i> obesity irrespective of gender.
	• The mean WC for the study sample is 99.7 cm for men and 92.6 for women – meaning that the average US adult female exceeds the cutoff for large WC whereas the average male does not.
	• It is possible that gender-specific WC thresholds are not ideal for defining obesity, being perhaps too sensitive for women.
	• Elevated glucose is also a significant factor. For those with large WC, GLU is the next most common disorder and for those with normal WC, it is the most prevalent disorder.
	• Impaired glucose and obesity are generally thought to go hand in hand but there may be a variant of propensity for elevated glucose that is not directly linked to obesity, including a hereditary mechanism or Non-alcoholic Fatty Liver Disease.
	• The exact mechanism of how insulin resistance influences obesity or vice versa remains unknown, as do the ways in which WC becomes the most prevalent disordered component in adults.