

**Cardiometabolic Risk and Healthcare Utilization and Cost
for Hispanic and non-Hispanic Women**

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Cardiometabolic Risk and Ethnicity

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ABSTRACT

OBJECTIVE: Cardiometabolic risk (CMR) is specific risk factors that increase the chance of developing diabetes and cardiovascular disease. We conducted a retrospective study of female members of a southwestern US HMO to: (1) determine the prevalence of CMR for 4 different groupings of CMR factors, identifying differences between Hispanics versus non-Hispanics; and (2) quantify differences in 2-year healthcare utilization and costs of CMR. **RESEARCH DESIGN AND METHODS:** Subjects were females who had a bone mineral density test during 2003-2004, and thus a measure of height and weight, allowing a BMI calculation (n=2578; 27.6% Hispanic). Risk factors used to define CMR groupings were: obesity (BMI), triglycerides, HDL, blood pressure, and fasting glucose. **RESULTS:** Results showed that Hispanics had significantly higher prevalence rates than non-Hispanics (65.8% versus 52.3%, respectively; $p<0.0001$). After adjusting for age and ethnicity, total costs for CMR patients in the groupings that required the presence of diabetes were twice the costs for those without CMR (approximately \$11,500 versus \$5500, respectively; $p<0.0001$). In all other groupings, costs for patients with and without CMR were approximately \$7000 versus \$5500, respectively ($p<0.0001$). Non-Hispanics had significantly higher visit costs than Hispanics. There were no differences in pharmacy costs. **CONCLUSIONS:** Higher utilization and costs associated with CMR suggest the need to identify and monitor patients with CMR. Our findings suggest diabetes prevention could yield substantial cost savings. Higher costs for non-Hispanics despite higher prevalence among Hispanics may indicate under-utilization of healthcare resources by Hispanics. Future research in CMR should explore ethnic differences in access to care and disease management programs.

Cardiometabolic risk (CMR) is specific risk factors such as smoking, low HDL, hypertension, elevated blood glucose, and abdominal obesity, which increase a patient's chance for developing diabetes and cardiovascular disease (1). The most common term for groupings of CMR in the literature is referred to as the "metabolic syndrome," and while the term includes several variations of risk factors, they all include some combination of abdominal obesity, hypertension, hyperglycemia and dyslipidemia (2). Of these, obesity is the most prevalent risk factor, suggesting that a focus on the traditional definitions may not be sufficient to gain a full understanding of the role each of these metabolic abnormalities plays in long-term cardiovascular risk (3-4). Additionally, the role of obesity is of particular interest as increases in the prevalence of metabolic syndrome over the last two decades have corresponded with widely reported increases in obesity (5-6). Since little research on CMR has focused specifically on the role of obesity, estimates of prevalence and outcomes of CMR to date have primarily been limited to studies conducted using the various more-restrictive definitions of metabolic syndrome.

The most current prevalence estimates for metabolic syndrome for the adult US population show a range of 18.0% to 32.3%, depending on whether data from the NHANES III or NHANES 1999-2000 data are used, 2001 vs. 2004 NCEP ATP-III criteria are used, diabetic subjects are included, and whether the prevalences have been age-adjusted or not (7). Regardless of how it is defined, there is clear consensus that the increasing prevalence will have an enormous impact on medical costs associated with health outcomes known to be related to metabolic syndrome, including cardiovascular disease and onset of type 2 diabetes (8-10).

Current studies regarding metabolic syndrome have highlighted national estimates of prevalence, impact of chronic disease progression, and cardiovascular events using population-based data sources such as NHANES, ARIC and Framingham (11-15). Clearly there are variations in the development of metabolic syndrome and its risk factors due to gender and ethnicity that should not be overlooked. For example, the San Antonio Heart Study highlighted the higher rate of diabetes progression in Hispanics versus non-Hispanics. In addition, it is widely known that the prevalence and treatment of hypertension varies between African Americans and other ethnicities (16-21).

This study examined several combinations of cardiometabolic risk factors, including two definitions of metabolic syndrome, but also several combinations of the risk factors that are not

considered to be metabolic syndrome per se. Thus, we used the general term cardiometabolic risk (CMR) to more accurately reflect our different groupings of diagnoses. We investigated the prevalence and economic impact of CMR within a large southwestern Health Maintenance Organization (HMO) which has a significant proportion of Hispanic members.

The study used a retrospective database design focusing on differences between female Hispanic versus female non-Hispanic health plan members over a 2-year period to answer the following research questions:

1. What is the 2-year prevalence for this population as defined by different groupings of cardiometabolic risk factors and ethnicity?
2. What differences exist between a cohort of members with CMR compared to a control group of members without CMR with respect to:
 - total resource utilization such as numbers of inpatient, outpatient, and ER visits, and pharmacy fills; and/or
 - total costs associated with overall healthcare utilization; and/or
 - comorbidity rates for conditions such as congestive heart failure, coronary heart disease, stroke, asthma, arthritis, depression, and osteoporosis.

RESEARCH DESIGN AND METHODS

Study Population

This study used a sample of convenience which included all health plan members having a bone mineral density test (DEXA) during the study period of January 1, 2003, and December 31, 2004. This population was selected since all these patients had (in addition to their DEXA results), an electronic measure of height and weight, allowing us to calculate BMI for our measure of obesity. Since there was a very small percentage of males in this group (9%), we limited our study to females. Eligible subjects were between the ages of 21 and 89 and continuously enrolled health plan members during the 2-year study period (n=4,211). Next, to be included in the study sample, a subject needed to have at least one measure for each of the remaining 4 cardiometabolic risk factors (in control or not) during the study period. In addition to obesity, these risk factors included measures of 1) triglycerides; 2) HDL; 3) blood

pressure (BP); and 4) fasting plasma glucose (FPG). Subjects were excluded if they had a diagnosis of cancer (excluding non-melanoma skin cancer) or bariatric surgery during the study period.

Subjects were considered continuously enrolled if there was no gap greater than 45 days in their health plan enrollment during the 2-year period. Age was calculated as of the beginning of the study period. This HMO, like most other health plans, does not collect race/ethnicity information on its individual members, except in its Medicaid population. However, we have access to GUESS (Generally Useful Ethnicity Search System) software that assigns ethnicity based on surname and has been validated on the New Mexico population (22). This software was developed in the 1970s at the University of New Mexico and, although surnames are grouped into a variety of ethnic classes by the software, the only reliable classifications for New Mexico are Hispanic and non-Hispanic. Since this HMO's population is predominantly Hispanic and non-Hispanic with very low proportions of African-Americans and Native Americans, the system is well-suited to this population. Validation of the GUESS program against SEER tumor registry records of the HMO's female members with breast cancer showed accurate assignment of ethnicity for 95.3% of non-Hispanic white women and 83.8% of Hispanic women (23).

All data were obtained from administrative electronic data with the exception of the bone mineral density data (DEXA) which was obtained from the HMO's radiology department software and blood pressure clinical measures which were obtained from medical record review. Abdominal obesity is typically defined by waist circumference values >88 cm for women; within this HMO's database, however, waist circumference is not available so a surrogate measure for abdominal obesity was replaced with an obesity measure defined as $BMI \geq 27.0$ kg/m².

Blood pressure measures are not available in this HMO's electronic database, so they were abstracted from medical records. Blood pressure was obtained during a visit to the practitioner's office or other non-emergency facility, such as a clinic. A blood pressure reading was ineligible if either the systolic was ≤ 79 or ≥ 250 or higher or the diastolic was ≤ 39 or ≥ 155 .

Cases & Controls

We classified individuals based on their eligibility for 6 CMR groupings, which are characterized by some or all of the 5 risk factors. We used a combination of clinical sources, diagnosis codes, and pharmacy fills to determine the presence of risk factors. Following are the clinical thresholds used to

identify an individual as having a risk factor, and since our sample consisted of women, we list here criteria for females only: (1) Obesity: BMI ≥ 27 kg/m² (2) high triglycerides: ≥ 150 mg/dL, (3) low HDL: < 50 mg/dL, (4) hypertension: BP ≥ 130 mm Hg (systolic) or ≥ 85 mm Hg (diastolic), and (5) IFG: FPG ≥ 100 mg/dL. Risk factors were not identified solely by abnormal clinical values; we also used ICD-9 diagnosis codes, lab values, and pharmacy fills to identify those with hypertension and dyslipidemia, as well as patients with diabetes.

The 6 CMR groupings used in the study include:

1. Metabolic syndrome NCEP-ATP III (National Cholesterol Education Program – Adult Treatment Panel III) definition: Individuals with three or more of the above risk factors.
2. Metabolic syndrome IDF (International Diabetes Federation) definition: Individuals with three or more of the above risk factors and the stipulation that obesity must be one of the three.
3. Obesity: Individuals with obesity (with or without other risk factors).
4. Obesity & Diabetes: Individuals with obesity and diabetes (with or without other risk factors).
5. Obesity & Dyslipidemia: Individuals with obesity plus high triglycerides and/or low HDL (with or without other risk factors).
6. Obesity & Diabetes & Dyslipidemia: Individuals with obesity and diabetes, plus high triglycerides and/or low HDL (with or without other risk factors).

For each CMR grouping, those not included in that grouping were considered controls. In some cases we conducted a comparison of individuals who met the CMR criteria for any of the 6 groupings. The corresponding control group for these comparisons was composed of individuals who did not qualify as having CMR according to any of the groupings.

Analyses

We calculated prevalence for the 2-year study period across each of the 6 groupings of CMR. For each grouping, odds ratios were calculated with 95% confidence intervals to determine the odds of Hispanics having CMR relative to non-Hispanics. Healthcare utilization and costs (2004 US \$) for the 6 groupings were comprised of inpatient hospitalizations, emergency room, and outpatient visits, as well as pharmacy fills for all medications plus subtotals for anti-diabetic, anti-dyslipidemia, and anti-hypertension medications. The outcome measure for resource utilization for cases and controls in each grouping was

measured by the average number of fills or visits across all cases (controls) in the grouping. To control for other variables, a two-part linear model was used for each of the 6 groupings so that adjusted means could be computed. For the comparison of Hispanic and non-Hispanic utilization, the linear model computed predicted cost at the mean age and prevalence. Likewise, for the comparison of CMR versus controls, the linear model computed predicted cost at the mean age and for a nominal ethnicity value. For the cost analysis, we used a two-part linear model to examine the impact of age (higher utilization and therefore higher cost with age), ethnicity (higher prevalence of CMR), and CMR (increased utilization for those with CMR vs. those without) on healthcare costs. Since the distribution of cost tends to be skewed to the right, we used the natural log of cost plus \$1 as a dependent variable in modeling costs.

RESULTS

Study population characteristics

There were 2,578 health plan members in our sample who met all the inclusion criteria. They were all female with an average age of 65.2 years (ranging from 33 to 89 years), and 27.6% were Hispanic. While this sample is not representative of the overall HMO female membership (average 50.2 years of age and 37.7% Hispanic), we believe it is representative of a sample of older women.

There was no difference in average age between those identified as having CMR in at least one of the groupings and those who did not qualify for any CMR group (65.5 and 64.9 years, respectively; $Z = 1.50$, $p = 0.14$). There were more Hispanics with CMR than those who did not qualify for any of the 6 groupings (32.4% vs. 21.4%; $Z = 6.56$, $p < 0.0001$). Table 1 shows the distribution of age ranges and ethnicity across the 6 CMR groupings. Average age is reasonably stable across all groupings. Even though there were statistically significant differences, this is likely due to the large sample sizes.

Prevalence and odds ratios for CMR by ethnicity

Period prevalence (2003 – 2004) across the 6 groupings were stratified by ethnicity. Overall prevalences were highest for the NCEP-ATP III and Obesity groupings (46.0% and 44.3%, respectively). These were followed by the IDF and Obesity & Dyslipidemia groupings which both had prevalences of approximately 32%. The Obesity & Diabetes grouping and Obesity & Diabetes & Dyslipidemia grouping both had much smaller prevalence rates, generally less than 10%.

Female Hispanics had higher prevalence rates compared to female non-Hispanics across all 6 CMR groupings (65.8% vs. 52.3%, respectively met inclusion criteria for at least one of the 6 CMR groupings; $p < .0001$), and the magnitude of this difference was relatively stable across all groupings. Among the individual groupings, the highest prevalence was found in the NCEP ATP-III group, where Hispanics had a prevalence of 55.0% vs. 42.9% for non-Hispanics ($Z = 12.3$, $p < 0.0001$). This was closely followed by the Obesity group: Hispanics, 52.7%, and non-Hispanics, 41.0% ($Z = 11.96$, $p < 0.0001$).

For all groupings the odds of having CMR was higher for female Hispanics compared to female non-Hispanics. The highest of these was seen in the Obesity & Diabetes group (OR=1.9, 95% CI=1.5-2.5) and the Obesity & Diabetes & Dyslipidemia group (OR=1.9, 95% CI=1.4-2.5). The lowest was seen in the Obesity & Dyslipidemia group (OR=1.4, 95% CI=1.2-1.7).

Healthcare utilization and costs

Resource utilization results comparing individuals with CMR to controls show that patients with CMR were significantly more likely to have at least one hospitalization ($p < 0.05$ in all 6 groupings). Outpatient visit rates were higher for patients with CMR relative to controls across all groupings, with the greatest differences observed in the two groupings where diabetes was a criterion (34.9 visits for patients with Obesity & Diabetes versus 22.1 visits for controls, $p < 0.01$; 34.4 visits for patients with Obesity & Diabetes & Dyslipidemia vs. 22.4 visits for controls, $p < 0.01$). These two groupings also had the highest percentages of individuals with at least one hospitalization and at least one ER visit, and had the highest rates of anti-diabetic, anti-dyslipidemic, and anti-hypertensive drug use.

Table 2 shows the results of the cost analyses, when age and ethnicity were accounted for, with significant differences across all groupings of CMR for overall total costs, outpatient costs, and overall total drug costs. Total costs for cases in the two groupings that required the presence of diabetes were more than twice as high as costs for controls (approximately \$11,500 vs. \$5500, respectively). In all other groupings total costs for cases were 25%-30% higher than costs for controls (approximately \$7000 vs. \$5500, respectively) ($p < 0.0001$ in all 6 groupings).

Additional analyses adjusted for age and CMR prevalence, examining the effect of ethnicity on costs. Results showed non-Hispanics having greater utilization and costs than Hispanics for all 6

groupings (F-values for total inpatient, outpatient, and emergency visits ranged from 9.23 to 12.43, $p < 0.002$ in all cases). The adjusted mean visit costs for groupings where diabetes was a criterion was approximately \$4900 for non-Hispanics vs. \$4200 for Hispanics. Costs were lower in groupings where diabetes was not a criterion (approximately \$4000 for non-Hispanics vs. \$3500 for Hispanics). There were no significant differences between Hispanic and non-Hispanic patients for total pharmacy fills ($p > 0.5$ across all groupings).

CONCLUSIONS

Similar to other studies that have found trends with higher prevalence of metabolic syndrome for Hispanic women (17), this study showed higher prevalence across all 6 groupings of CMR for Hispanic women. Odds ratios for prevalence across groupings ranged from 1.4 to 1.9, validating those high prevalence rates. Interestingly, although the NCEP-ATP III group provided the highest prevalence rate for Hispanic women (55.0%), when all women who were identified as meeting any of the 6 groupings were collectively included, prevalence for this group was a striking 65.8%.

Ethnicity, resource use, and cost for individuals with CMR

The primary driver of resource use and cost for our study was the presence of CMR. Almost across the board, those patients with CMR had higher rates of inpatient and outpatient visits along with greater numbers of pharmacy fills than those without CMR. The highest rates of resource usage and costs were for the CMR groupings comprised of people who had both obesity and diabetes with or without other risk factors. Interestingly, the Obesity & Diabetes group had rates as high as the Obesity & Diabetes & Dyslipidemia group. The fact that resource use and costs were higher for these groups than for the Only Obesity group may suggest that certain risk factors have a particularly influential impact on economic outcomes. In the two groupings requiring the presence of diabetes, costs for CMR patients were more than two times higher than costs for patients without CMR, but were only 25-30% higher in the other 6 groupings. Our findings are consistent with previous research that found individuals with diabetes are more costly than those without diabetes (24) and suggest the prevention of diabetes could yield substantial cost savings. The impact of these results on healthcare planning cannot be overstated when observing such high prevalence rates of CMR for Hispanics in a state with such a large proportion of this ethnicity.

The cost analyses which adjusted for age and CMR status, however, showed that utilization costs were actually higher for non-Hispanics than Hispanics, and this finding occurred across all CMR groupings for visits, although no differences were found for medications. Previous research has shown that Hispanics often under-utilize healthcare, even in the face of chronic illness (25). Of particular interest here are differences noted between non-Hispanics and Hispanics with respect to visits, but no difference for medication fills. It may be that while Hispanics receive diagnoses for their chronic illnesses with respective treatment fills, the decrease in number of visits may indicate their disease is not being appropriately followed. We believe these results have important implications for disease management strategies, and are vital for reducing healthcare disparities. While much of the literature on disparities focuses on healthcare access, our sample of health plan members had equal access with similar copay costs. Perhaps programs which attempt to prevent and manage chronic illness need to pay special attention to cultural differences which may prevent patients from seeking the healthcare they need.

Strengths and limitations of the study

As cited earlier, estimates of prevalence vary widely depending on which risk factors are examined and how they are grouped. The two most widely cited definitions of metabolic syndrome include those proposed by the National Institute of Health (NIH) in the National Cholesterol Education Program – Adult Panel III (NCEP-ATP III) as updated in 2004 (3, 7) and the definition proposed by the World Health Organization (WHO) as part of their diabetes diagnoses and classification guidelines (8). The International Diabetes Foundation (IDF) has recently proposed a modified version of the NCEP-ATP III definition which requires that one of the criteria always include obesity as measured by waist circumference (2).

We included both the NCEP-ATP III and the IDF metabolic syndrome definitions in our study, using BMI as a surrogate for waist circumference for the latter definition. We also included 6 other CMR groupings in our study that, like the IDF definition, included obesity as one of the risk factors. A strength of this analysis is that we were able to validate the greater risk for Hispanics with CMR across all 6 groupings. Although we cannot specify which risk factors or which CMR grouping is best at predicting who might eventually develop cardiovascular disease, we found that the NCEP-ATP III group resulted in

the highest prevalence rates. We also found that those groups that included people with diabetes were associated with higher resource utilization and higher costs.

We recognize a few limitations. One is that for our sample, the inclusion criteria required that all subjects have a measure of all 5 risk factors. We recognize that this requirement may have inadvertently biased our sample towards those individuals who are “healthcare users.” Additionally, our sample included all women with a bone mineral density screening. Although this test is generally the standard of care for women over 50 years of age, we cannot rule out the possibility that the presence of osteoporosis may have skewed these results in some unknown manner. Finally, a review of the literature reveals that application of alternate groupings of risk factors has produced conflicting results when they have been used to estimate not only prevalence and historical trends, but also predicted cardiovascular or diabetes risk (12). The short time-frame of our study and the use of retrospective, cross-sectional data limited our ability to validate the predictability of CMR in identifying people who may be diagnosed with cardiovascular disease in the future. Future research with longitudinal or prospective study designs may be able to advance the findings of this analysis.

The prevalence of cardiometabolic risk, whether defined as metabolic syndrome or other risk groupings, varies dramatically by age, race and ethnicity (13-18), as do the risk factors that comprise it (19-21). Overall, Hispanic males and females, and African American females appear to have a disproportionately greater prevalence than the overall US population (17). This study’s higher CMR prevalence rates among female Hispanics relative to non-Hispanics are consistent with these earlier studies. The higher utilization and cost for those with CMR suggest the need for health maintenance organizations to address identification and monitoring health plan members with CMR. Higher cost for non-Hispanics in the face of higher Hispanic CMR prevalence may indicate under-utilization of healthcare resources for Hispanics.

Future research should explore cultural diversity as it relates to CMR, including differences between Hispanics and non-Hispanics in access to care and disease management programs. Given the trend of rising CMR prevalence and the substantial long-term associated clinical and economic costs, a better understanding of the differences in patterns of care among this population will be critical to ensuring treatment is appropriately and effectively delivered to those in need.

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Table 1. Age and Ethnicity Distributions for Each Cardiometabolic Risk (CMR) Grouping

	Metabolic Syndrome NCEP ATP III*		Metabolic Syndrome IDF**		Obesity		Obesity & Diabetes		Obesity & Dyslipidemia		Obesity & Diabetes & Dyslipidemia	
	Cases	Control	Cases	Control	Cases	Control	Cases	Control	Cases	Control	Cases	Control
Age range	<i>N = 1,186</i>	<i>n = 1,392</i>	<i>n = 831</i>	<i>n = 1,747</i>	<i>n = 1,141</i>	<i>n = 1,437</i>	<i>n = 245</i>	<i>n = 2,333</i>	<i>n = 828</i>	<i>n = 1,750</i>	<i>n = 202</i>	<i>n = 2,376</i>
< 50	5.4%	8.9%	6.0%	7.9%	7.9%	6.8%	3.7%	7.7%	6.6%	7.6%	4.5%	7.5%
50 - 59	20.2%	24.5%	22.4%	22.6%	24.1%	21.3%	20.4%	22.8%	23.7%	22.0%	19.8%	22.8%
60 - 69	36.1%	30.9%	37.1%	31.5%	35.8%	31.3%	41.6%	32.4%	36.5%	31.8%	41.6%	32.6%
70 - 79	30.8%	30.1%	29.0%	31.1%	26.9%	33.2%	27.8%	30.7%	27.8%	31.7%	26.7%	30.7%
80+	7.5%	5.6%	5.5%	6.9%	5.3%	7.4%	6.5%	6.5%	5.4%	7.0%	7.4%	6.4%
Mean age	66.0	64.5	65.1	65.2	64.3	65.9	65.9	65.1	64.7	65.4	65.9	65.1
Ethnicity												
Hispanic	32.5%	23.3%	33.1%	25.0%	32.9%	23.4%	40.4%	26.2%	32.4%	25.3%	40.1%	26.5%
non-Hispanic	67.5%	76.7%	66.9%	75.0%	67.1%	76.6%	59.6%	73.8%	67.6%	74.7%	59.9%	73.5%

*National Cholesterol Education Program - Adult Treatment Panel III

**International Diabetes Federation

TABLE 2. Two Year Adjusted* Mean Cost (\$US) for Cases versus Controls Across CMR** Groupings***

	NCEP ATP III			International Diabetes Foundation (IDF)			Only Obesity		
	Case	Control	p-value	Case	Control	p-value	Case	Control	p-value
Visits									
Hospitalizations	624	261	0.0354	587	346	0.2725	490	372	0.4584
Emergency visits	55	34	0.0202	52	40	0.1023	48	41	0.0952
Outpatient visits	3,742	2,939	<0.0001	3,826	3,069	<0.0001	3,523	3,116	<0.0001
Drugs									
All drugs	1,996	1,339	<0.0001	2,021	1,449	<.0001	1,821	1,468	<0.0001
Anti-diabetics	148	18	0.3044	171	34	0.0872	126	41	0.0972
Anti-dyslipidemics	514	269	0.5101	543	303	0.1031	459	318	0.1001
Anti-hypertensives	325	161	0.0024	348	184	0.0021	312	176	0.0017
TOTAL	7,247	5,164	<0.0001	7,414	5,510	<0.0001	6,680	5,587	<0.0001
	Obesity & Diabetes			Obesity & Dyslipidemia			Obesity & Diabetes & Dyslipidemia		
	Case	Control	p-value	Case	Control	p-value	Case	Control	p-value
Visits									
Hospitalizations	873	378	0.1228	564	356	0.2963	884	384	0.1590
Emergency visits	57	43	0.1135	46	43	0.1066	49	44	0.0988
Outpatient visits	5,272	3,129	<0.0001	3,647	3,141	<0.0001	5,182	3,162	<0.0001
Drugs									
All drugs	3,697	1,468	<0.0001	1,907	1,498	<0.0001	3,416	1,505	<0.0001
Anti-diabetics	572	27	0.0172	140	48	0.2739	561	37	0.0855
Anti-dyslipidemics	753	342	0.2177	518	314	0.2445	720	352	0.4755
Anti-hypertensives	665	198	<0.0001	306	203	0.0148	909	485	0.4755
TOTAL	11,569	5,645	<0.0001	7,033	5,654	<0.0001	11,249	5,728	<0.0001

*Adjusted for age and ethnicity

**Cardiometabolic Risk

***Mean costs for all patients within a category

Online Appendix. Two Year Resource Utilization Percents and Rates for Cases vs. Controls across CMR* Groupings

	Metabolic Syndrome NCEP ATP III**			Metabolic Syndrome IDF***			Only Obesity		
	Rate (mean)		p- value	Rate (mean)		p- value	Rate (mean)		p- value
	Case	Control		Case	Control		Case	Control	
N	<i>n</i> = 1,186	<i>n</i> = 1,392		<i>n</i> = 831	<i>n</i> = 1,747		<i>n</i> = 1,141	<i>n</i> = 1,437	
Visits									
Hospitalizations	0.3	0.2	<.0001	0.3	0.2	<.001	0.2	0.2	NS
Emergency visits	0.3	0.2	<.0001	0.3	0.2	<.001	0.2	0.2	<.05
Outpatient visits	26.2	20.9	<.0001	26.1	22.0	<.0001	24.2	22.6	<.0001
Drugs									
All Drugs	39.6	28.2	<.0001	40.4	30.0	<.0001	37.6	30.0	<.0001
Anti-diabetics	2.6	0.2	<.0001	2.8	0.6	<.0001	2.1	0.7	<.0001
Anti-dyslipidemics	3.6	2.0	<.0001	3.6	2.3	<.0001	3.1	2.5	<.0001
Anti-hypertensives	8.9	4.8	<.0001	9.3	5.4	<.0001	8.5	5.3	<.0001
	Obesity & Diabetes			Obesity & Dyslipidemia			Obesity & Diabetes & Dyslipidemia		
	Rate (mean)		p- value	Rate (mean)		p- value	Rate (mean)		p- value
	Case	Control		Case	Control		Case	Control	
N	<i>n</i> = 245	<i>n</i> = 2,333		<i>n</i> = 828	<i>n</i> = 1,750		<i>n</i> = 202	<i>n</i> = 2,376	
Visits									
Hospitalizations	0.3	0.2	<.001	0.3	0.2	NS	0.3	0.2	NS
Emergency visits	0.3	0.2	<.01	0.3	0.2	<.01	0.3	0.2	NS
Outpatient visits	34.9	22.1	<.0001	25.0	22.5	<.0001	34.4	22.4	<.0001
Drugs									
All Drugs	61.1	30.5	<.0001	38.2	31.2	<.0001	58.2	31.3	<.0001
Anti-diabetics	9.4	0.5	<.0001	2.3	0.9	<.0001	9.2	0.1	<.0001
Anti-dyslipidemics	5.0	2.5	<.0001	3.5	2.4	<.0001	5.0	2.5	<.0001
Anti-hypertensives	13.8	5.9	<.0001	8.5	5.8	<.0001	13.0	6.1	<.0001

Note: Rate is the total number of fills/visits divided by the number of individuals in the category

*Cardiometabolic Risk

**National Cholesterol Education Program - Adult Treatment Panel III

***International Diabetes Federation