Cardiometabolic Risk Factors and Healthcare Cost for a Sample of Health Plan Members

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Background

- Cardiometabolic risk (CMR) is the overall risk of developing diabetes or cardiovascular disease due to a cluster of modifiable risk factors.
- A term frequently seen in the literature is “metabolic syndrome” which is a specific cluster of CMR factors.
- CMR has been defined in a variety of ways, but all definitions include some combination of abdominal obesity, hypertension, hyperglycemia, and dyslipidemia.

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Objectives

- To understand and quantify the prevalence of CMR factors for Hispanic and non-Hispanic health plan members
- To quantify differences in 2-year healthcare costs of CMR

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Methods

The study used:

- a retrospective database design with data from 1/1/03 – 12/31/04
- eligible subjects with a measure of BMI (for obesity), triglycerides, HDL, blood pressure, and fasting plasma glucose during the study time
- subjects between the ages of 21 and 89 and continuously enrolled during the study period

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Study Sample

- A sample of convenience was used:
  - all health plan females with a bone mineral density screen during the study period (4,223)*
- Study sample n = 2,578
  - people with all 5 risk factor measures
    - 65.2 mean age
    - 27.6% Hispanic
    - 8.5% smokers

*[Note: this sample was used because, in addition to bone density results there were electronic measures of height and weight which allowed calculation of BMI]

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Risk Factor Definitions

	Abnormal Clinical Values	Diagnosis	Treatment	Combination
Obesity	BMI ≥ 27.0 kg/m^2			
HDL	< 50 mg/dL (women)			
TG	≥ 150 mg/dL	ICD-9 dx = 272.1		
HTN	systolic - ≥ 130 mm Hg diastolic - ≥ 85 mm Hg	ICD-9 dx = 401.xx		ICD-9 dx = 401.xx and 1 or more rx fill
IFG	≥ 100 mg/dL			
Diabetes	2 or more FPG >125 mg/dL	ICD-9 dx = 250.x0, 250.x2	2 or more rx fills	ICD-9 dx = 250.x0, 250.x2 and/or 1 or more rx and/or FPG>125 mg/dL

BMI = body mass index; dx = diagnosis; rx = medication fill

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Study CMR factors Groupings

- **NCEP-ATP III** (metabolic syndrome): 3 or more risk factors
- **IDF**: 3 or more risk factors where at least 1 is obesity
- **Obesity**: risk factor of obesity, with or without any others
- **Obesity & Diabetes**: risk factors obesity and diabetes, with or without any others
- **Obesity & Dyslipidemia**: risk factors obesity and high triglycerides and/or low HDL, with or without any others
- **Obesity & Diabetes & Dyslipidemia**: risk factors obesity, diabetes, and high triglycerides and/or low HDL, with or without any other

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Cases vs. Controls

- Cases were all individuals with risk factors in a corresponding CMR factors grouping.
- For each CMR factors grouping, those individuals not included in that grouping were considered controls.
  - For some analyses, cases were defined as individuals who met the criteria for any of the 6 groupings.
  - For these analyses, controls were individuals who did not qualify as having CMR factors for any grouping.

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Measures Used for Costs

- Costs of outpatient visits (primary care or specialty)
- Costs of inpatient visits
- Costs of emergency visits
- Costs of lab, radiology or other procedures
- Costs of various types of medications
- Total costs for 2-year study period

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Analyses

- For each CMR factors grouping, 2-year prevalence odds ratios were calculated with 95% CI comparing Hispanic with non-Hispanic.
- To compare Hispanic and non-Hispanic costs, a linear model computed predicted cost at mean age and prevalence.
- A 2-part linear model examined the impact of age, ethnicity, and CMR factors on healthcare costs.

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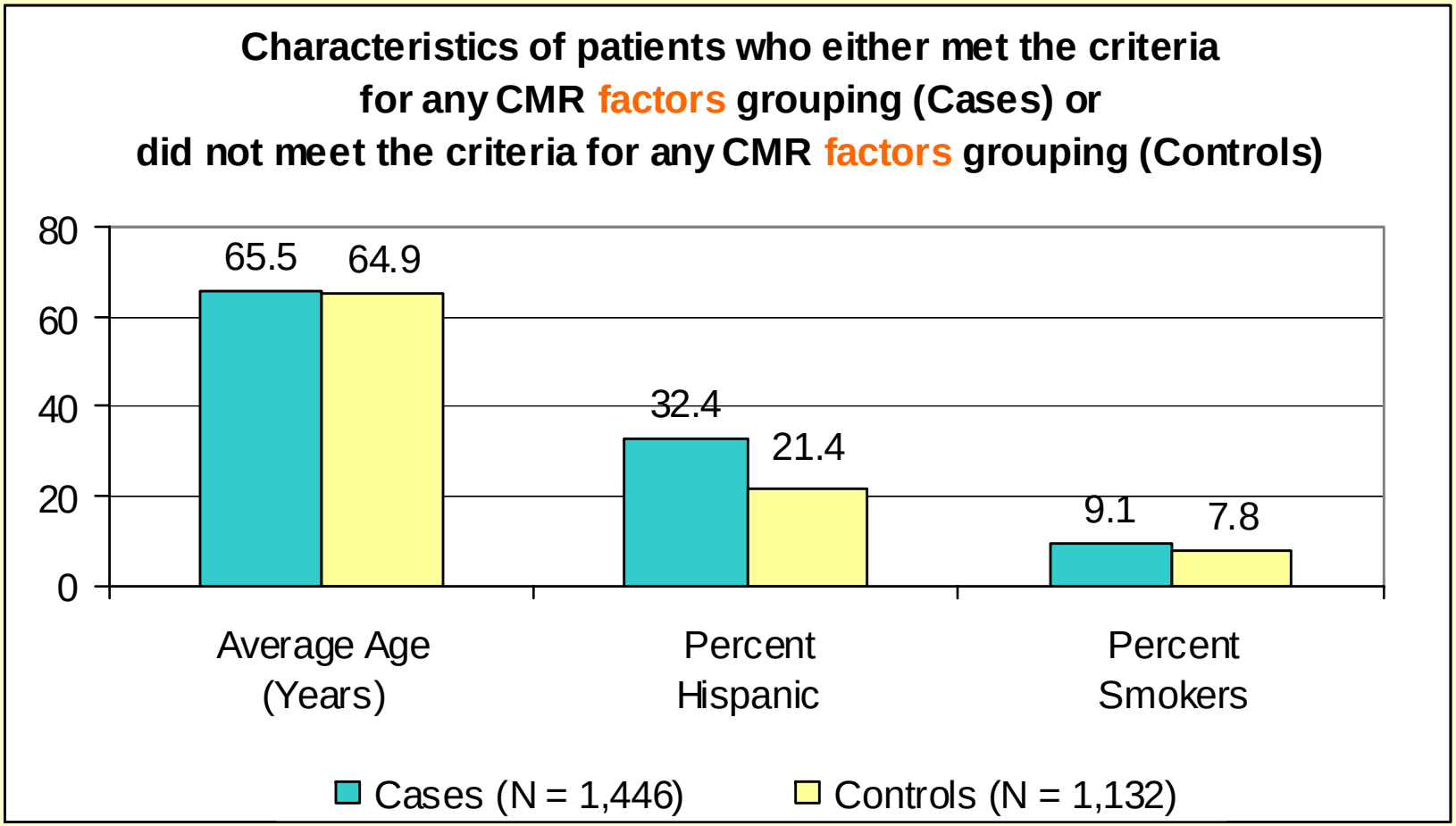
Cases vs. Controls



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Results

- Hispanics had significantly higher prevalence rates compared to non-Hispanics across all CMR factors groupings (65.8% vs. 52.3%, respectively).
- Patients with CMR factors had significantly higher total costs than controls (*p*-values < 0.001 across all CMR factors groupings).
- Adjusted mean total costs for patients with CMR factors ranged from $3,923 to $6,056 vs. $3,203 to $3,488 for controls.

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Results

- Non-Hispanics had higher costs than Hispanics for all CMR factors groupings (*F*-values ranged from 5.11 to 6.70, $p < 0.02$ in all cases).
- Adjusted mean total costs for Hispanics ranged from $3,130 to $4,011 vs. $3,648 to $4,660 for non-Hispanics.
- Higher costs for both ethnicities occurred where one of the risk factors was diabetes.

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Conclusions

- Higher CMR factors prevalence rates for Hispanics vs non-Hispanics are consistent with earlier studies.
- Higher costs for those with CMR factors suggest the need for HMOs to address identification and monitoring of patients with CMR factors.
- Higher costs for non-Hispanics in the face of higher Hispanic CMR factors prevalence may indicate under-utilization of healthcare resources for Hispanics.
- Future research should explore cultural diversity as it relates to CMR factors.

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