

Estimation of the mortality caused by diabetes mellitus in Panama and its relationship to gender and cardiovascular risk factors

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INTRODUCTION

Although diabetes mellitus is among the top 5 leading causes of death in the Republic of Panama, little information is available that relate the mortality from this disease to biological risk factors such as age, gender, obesity, hypertension, hypercholesterolemia, and socioeconomic factors.

OBJECTIVES

To characterize the status of diabetes mellitus mortality in Panama and its relationship with risk factors present in the population.

MATERIALS AND METHODS

The methodology involved compilation and analysis of data from the National Survey of Quality of Life and Health, Living Standards Survey obtained in a sample of 25,748 individuals, data from the National Population Census of 2000 and 2010 and the National Registries of mortality from all causes for the years 2001 to 2009. We generated indicators of crude, adjusted and specific rates of mortality from diabetes and compared these rates with the presence of risk factors such as obesity, hypertension and elevated cholesterol at provincial, district and county levels. Regression coefficients were derived from multivariate analysis of biologic and socioeconomic factors known to be related to the risk of dying from diabetes.

RESULTS

After compiling and analyzing the data for mortality from diabetes mellitus for the years 2001 – 2009, for biologic risk factors and socioeconomic factors from different regions of Panama and inserting these in a geographic information system, we find that women have a higher mortality from diabetes than men in Panama. Women also have a higher prevalence of obesity and also a higher prevalence of self-reported hypertension and of elevated cholesterol. Certain provinces like Los Santos and Colon have higher crude mortality rate than the rest of the country. The biological risks factors found to be most related to diabetes mortality were obesity, hypertension, hyperlipidemia and being 55 years of age or older. For the socio-economic analysis the factors found to be most related to diabetes mortality were the following: having less than 6 years of schooling and being unemployed.

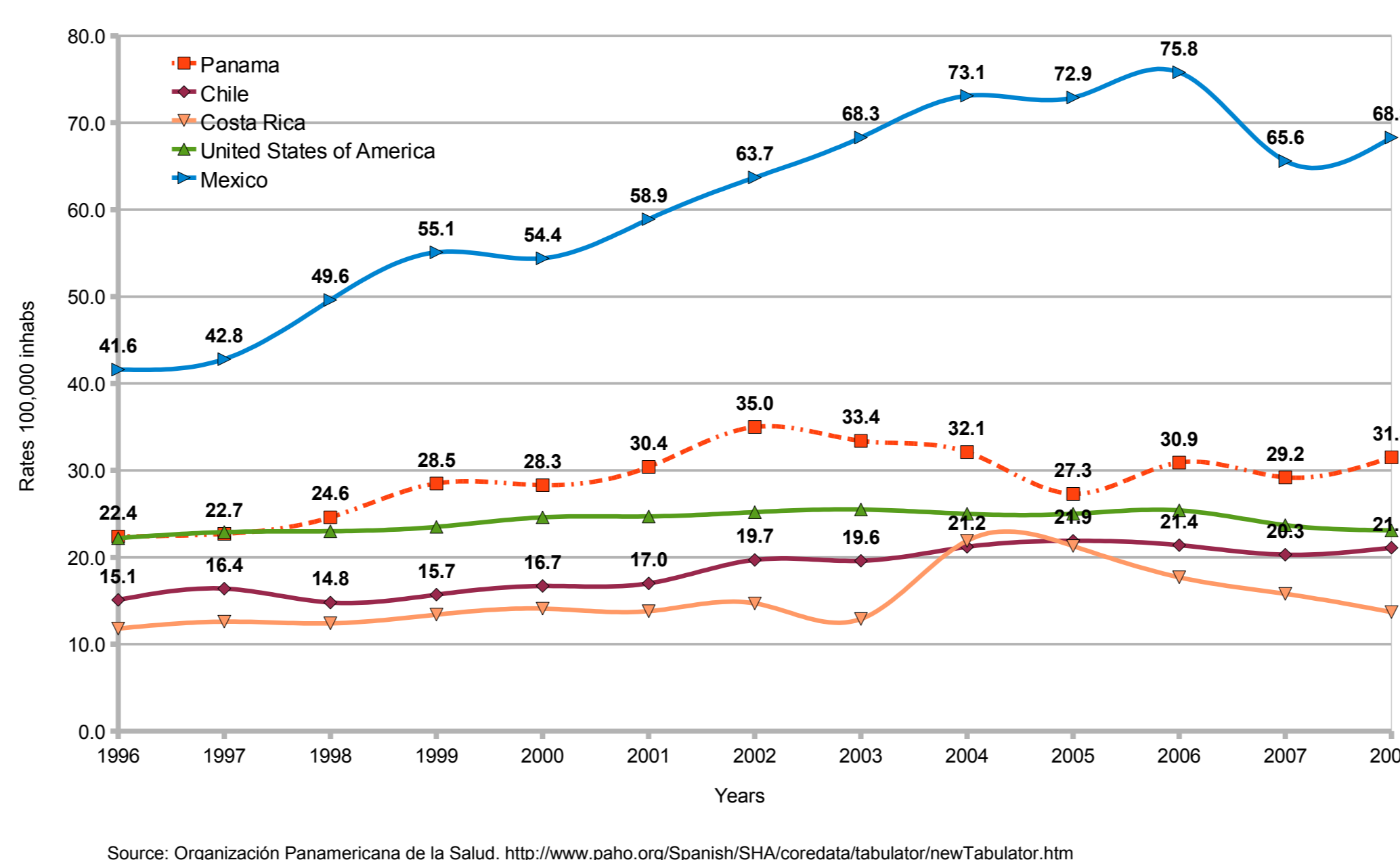
CONCLUSIONS

During the years 2001 - 2009, women suffered a higher mortality from diabetes than men. Women had a higher prevalence of obesity than men. Mortality was higher in both sexes after reaching 45 or more years of age. Some provinces exhibited a higher mortality rates from diabetes probably because they had a greater number of older inhabitants, and a higher prevalence of obesity and hypertension. Unemployment and less education appear also to be related to mortality from diabetes.

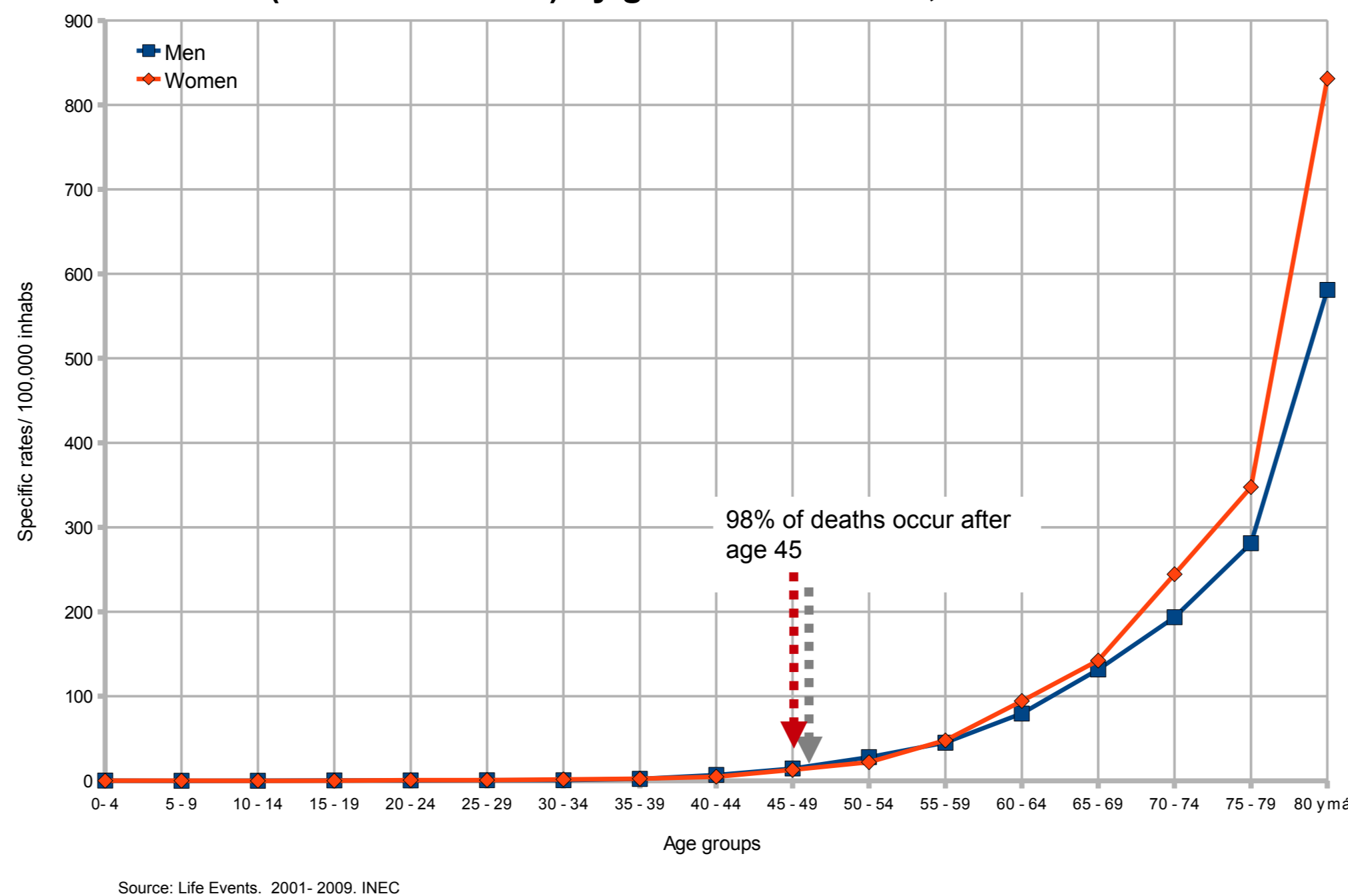
Economic, Social and Health Indicators of Republic of Panama. 2010.



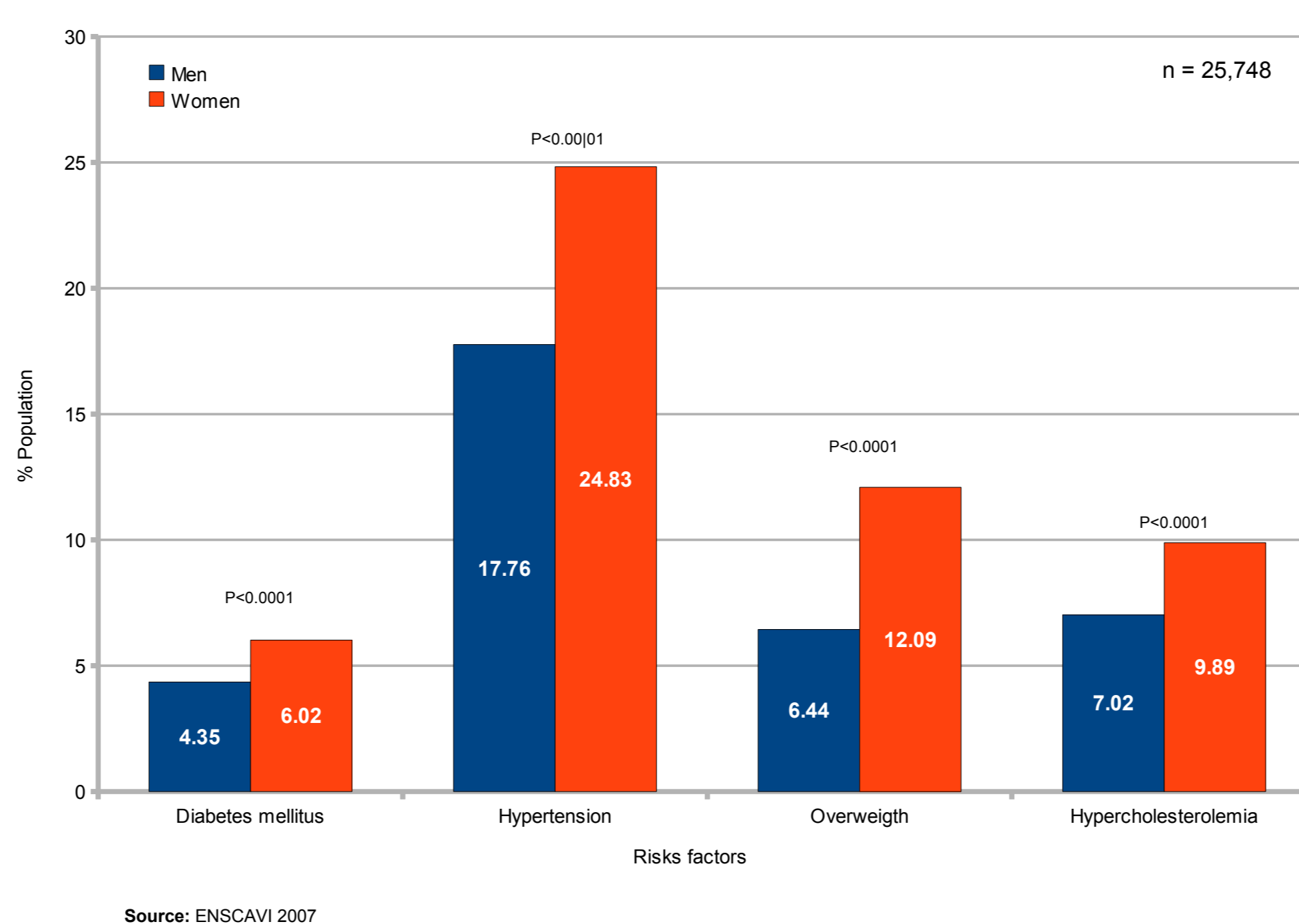
Estimated mortality rate for diabetes mellitus (ICD/10: E10-E14) in Panama and other selected countries, 1996-2008



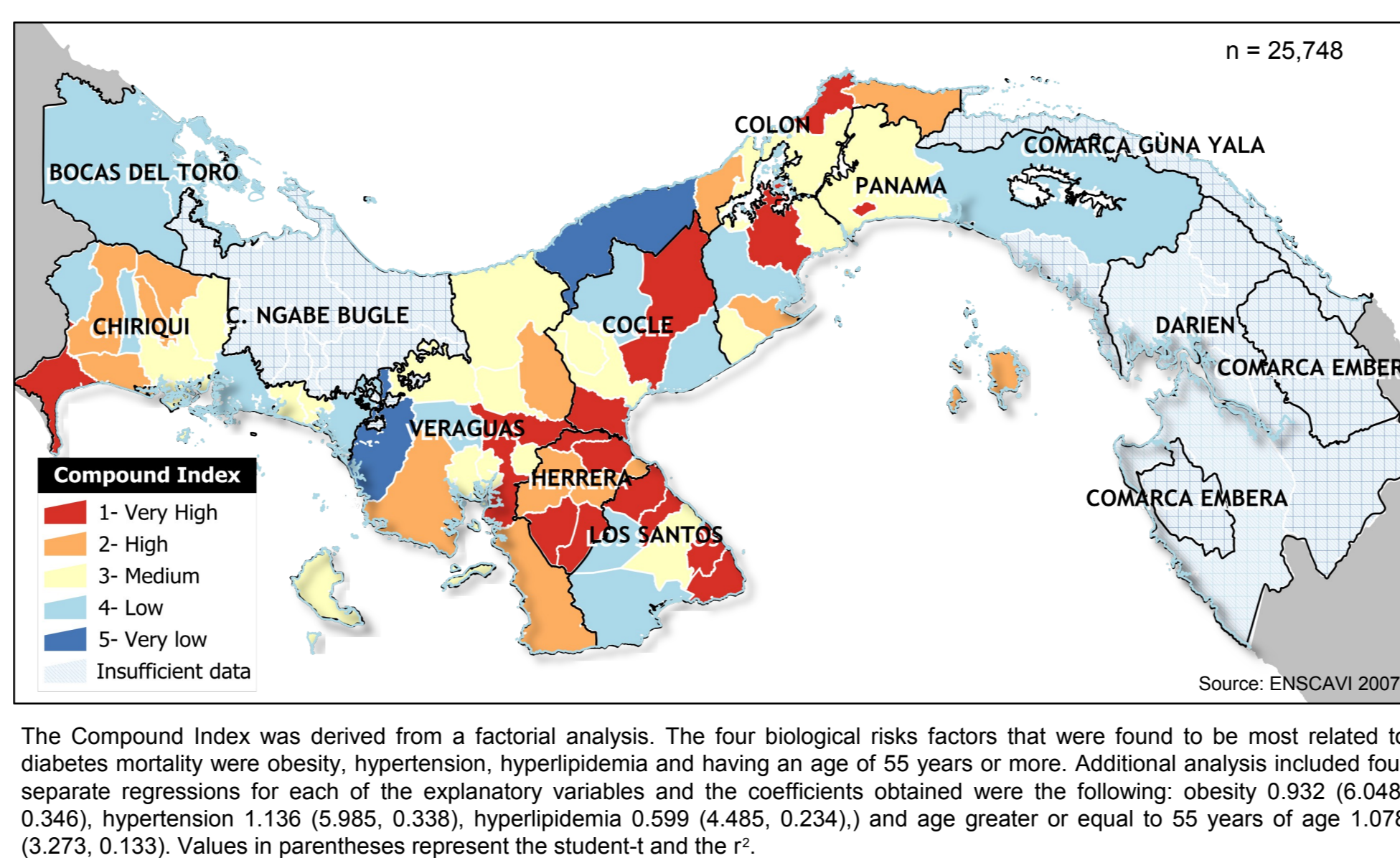
Age-specific death rate from Diabetes Mellitus (CIE/10: E10-E14) by gender in Panama, 2001 - 2009



Percentage differences by gender of subjects studied in ENSCAVI who answered "yes" or "no" if they had been diagnosed by a doctor in the last year as having the named risk factors. 2007.

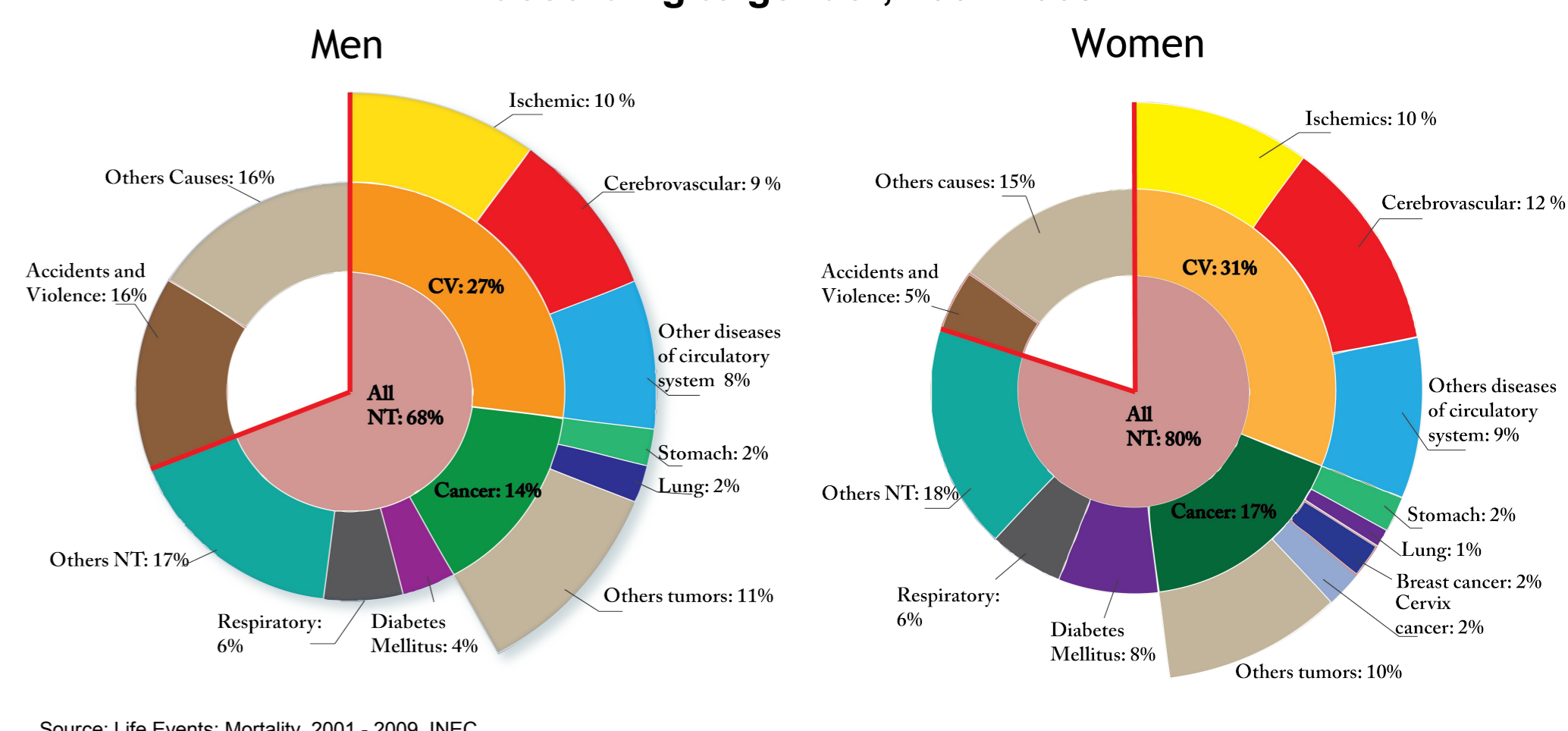


Analysis of biological risk factors related to mortality from diabetes mellitus by district. Panama. 2007.

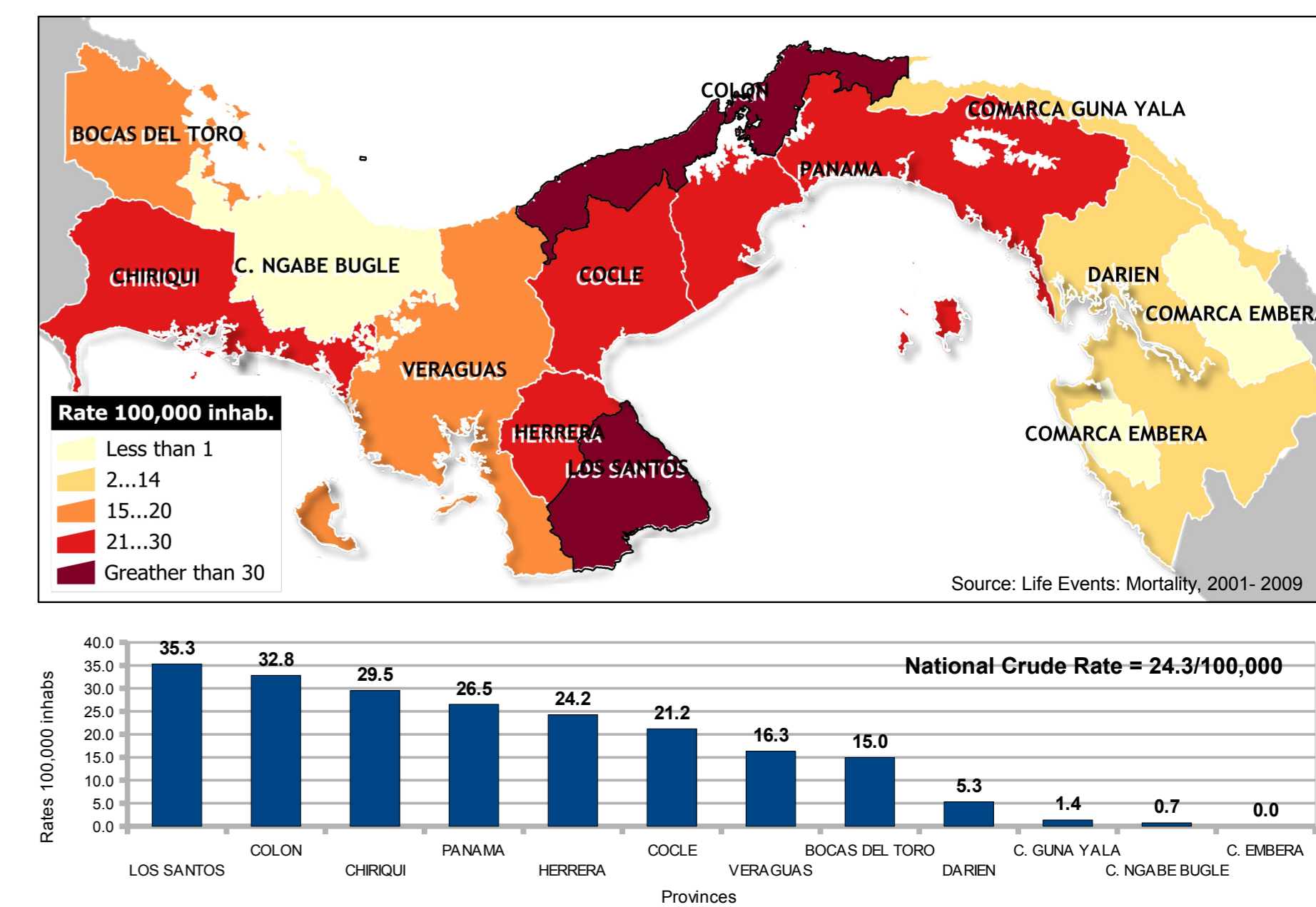


The Compound Index was derived from a factorial analysis. The four biological risks factors that were found to be most related to diabetes mortality were obesity, hypertension, hyperlipidemia and having an age of 55 years or more. Additional analysis included four separate regressions for each of the explanatory variables and the coefficients obtained were the following: obesity 0.932 (6.048, 0.346), hypertension 1.138 (5.985, 0.338), hyperlipidemia 0.599 (4.485, 0.234), and age greater or equal to 55 years of age 1.078 (3.273, 0.133). Values in parentheses represent the student-t and the r².

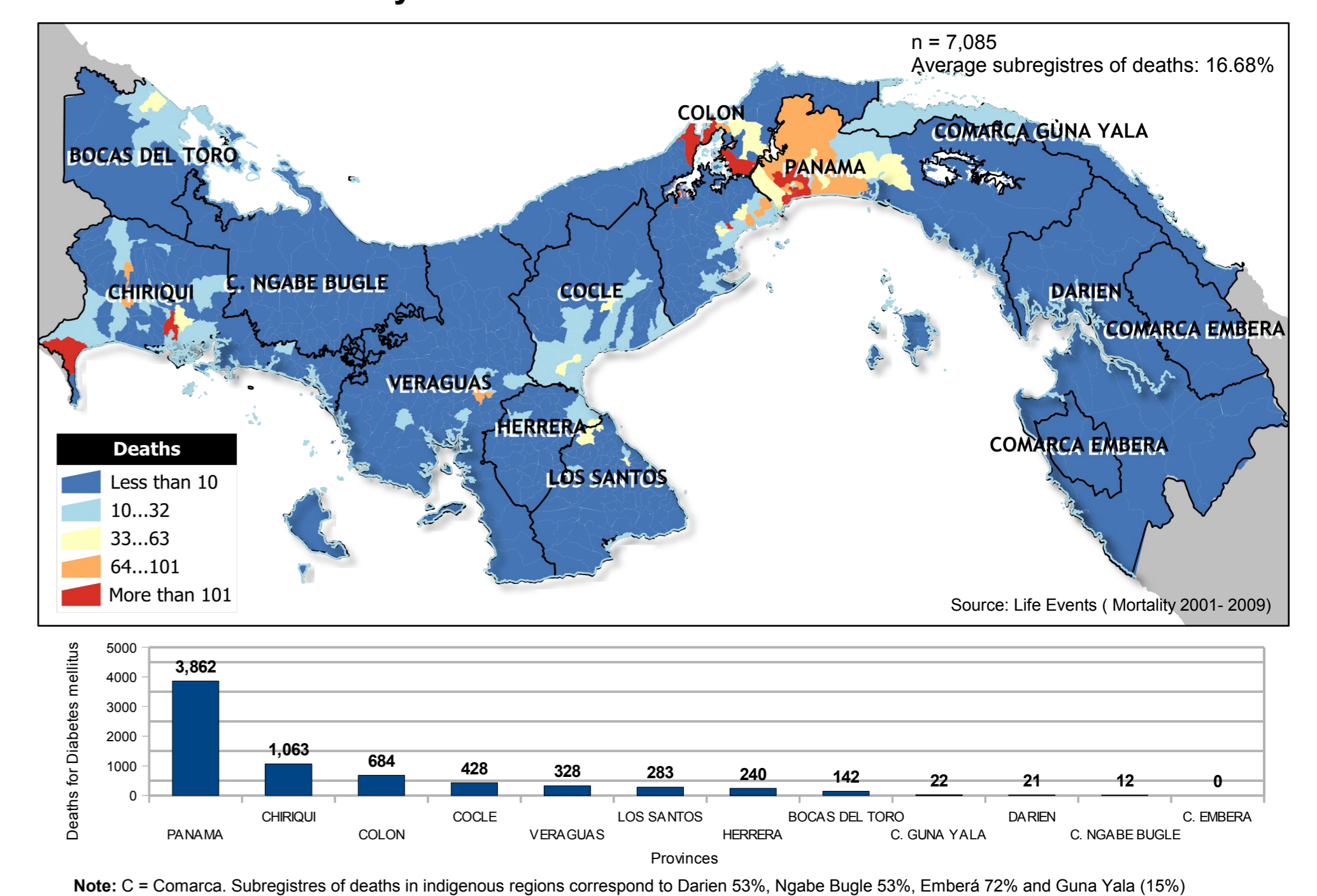
Estimated proportional mortality by major causes of death in Panama according to gender, 2001-2009.



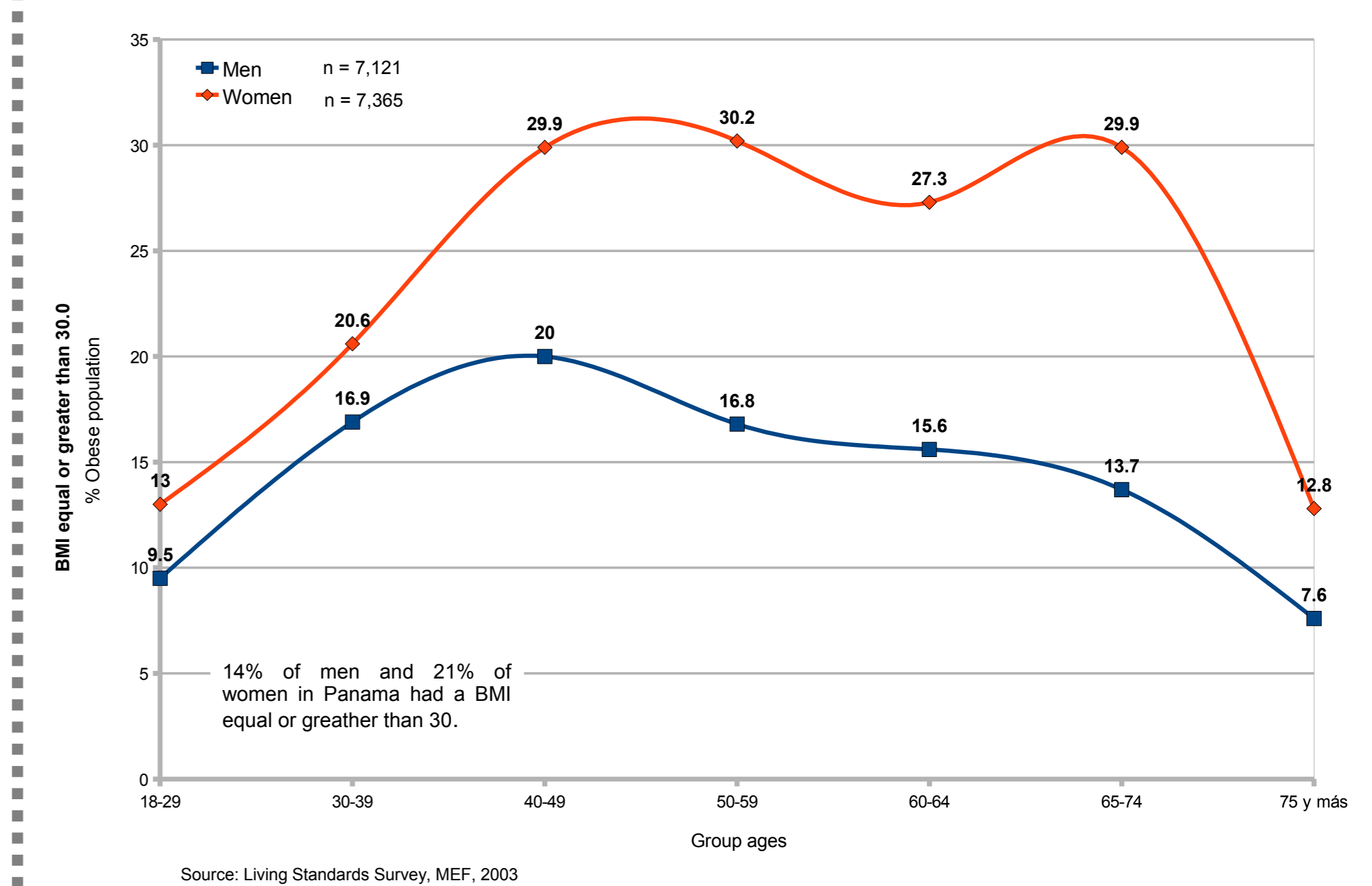
Crude death rate for diabetes mellitus (ICD/10: E10-E14) by provinces. Panama. 2001 to 2009.



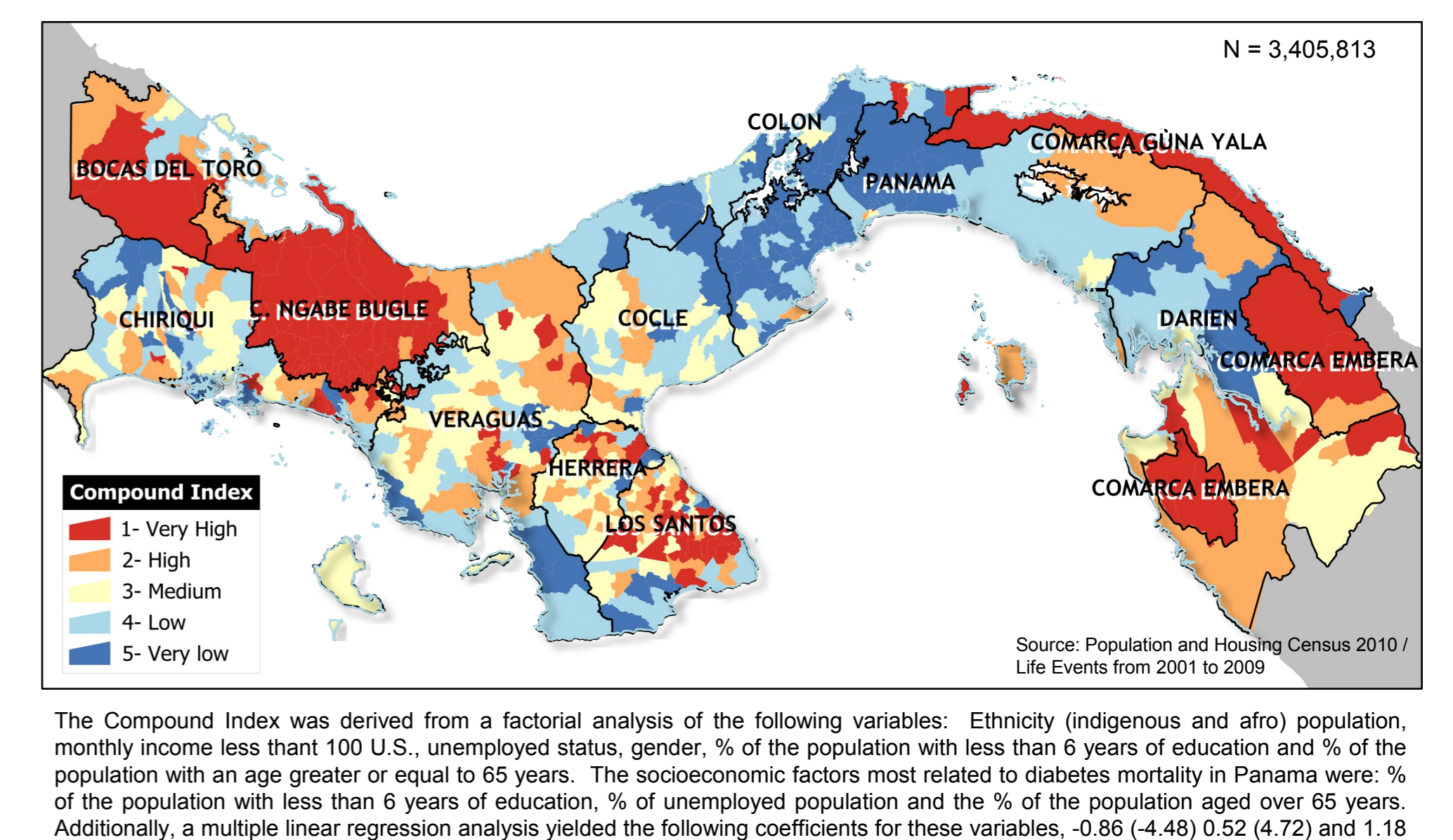
Total number of deaths due to Diabetes Mellitus (ICD/10: E10-E14) by counties. Panama. 2001 to 2009.



Prevalence of obesity in the adult population based on BMI, by age and gender. ENV 2003. Panama



Analysis of socioeconomic factors related to mortality from diabetes mellitus by counties. Panama. 2001 to 2009.



The Compound Index was derived from a factorial analysis of the following variables: Ethnicity (indigenous and afro) population, monthly income less than 100 U.S., unemployed status, gender, % of the population with less than 6 years of education and % of the population with an age greater or equal to 65 years. The socioeconomic factors most related to diabetes mortality in Panama were: % of the population with less than 6 years of education, % of unemployed population and the % of the population aged over 65 years. Additionally, a multiple linear regression analysis yielded the following coefficients for these variables: -0.86 (-4.48), 0.52 (4.72) and 1.18 (10.04) respectively. Values in parentheses are the t statistics - student. The coefficient r² was 0.283 and the correlation 0.532. The dependent variable was the crude mortality rate for diabetes mellitus.