Heart disease is the leading cause of death for both men and women in the United States. 1

About 610,000 people die from heart disease in the United States every year – that’s 1 in 4 deaths. 1

High blood pressure, high LDL cholesterol, and smoking are key risk factors for heart disease. About half of Americans (49%) have at least one of these three risk factors. 2

Someone in the United States dies from a heart disease-related event every minute. 3

In the United States, someone has a heart attack every 63 seconds. 3

### Methods

This study examined possible risk factors for heart attack using data collected by the Wisconsin Longitudinal Study (WLS), a 58-year-long survey study on the lives of 10,317 Wisconsin high-school graduates. 1

2,355 environmental, health, and socio-behavioral variables and 77 single-nucleotide polymorphisms (SNPs) were analyzed with heart attack data for 11,686 WLS graduate respondents (2,038 men and 5,368 women). 1

Data was analyzed for those having a heart attack up to 72 years of age and for those experiencing a heart attack between 65-72 years of age. This allowed us to determine whether risk factors change over a person’s lifetime, and which factors are most important in younger versus older individuals. 1

SNPs are genetic variations that occur in a single nucleotide location in DNA. On average there are about 10 million SNPs in the human genome. Studies have shown that specific SNPs may be linked to heart attacks 4, 5, but there is no consensus about which genes are most predictive. 1

Statistical analyses included exploring multi-factor interactions using recursive partitioning and random forest, and single-factor effects using Chi-square and logistic regression, with the R online statistical software package. 1

### Results

### Background

Heart attacks are higher for men than for women in the WLS. 1

Heart attack rates are higher than the national average for men and women in the WLS up to age 72, but are lower among those aged 65-72 years. 1

Among men to age 72: high cholesterol, diabetes, stroke, high blood pressure, family history and exposure to dangerous conditions at work were the highest risk factors for heart attack (Table 1a). 1

Among men aged 65-72: only stroke and diabetes remained as heart attack risks (Table 1b). 1

Among women to age 72: diabetes, depression, suicide with financial distress, high blood pressure, high cholesterol, not creating a lifestyle to one’s liking, being unmarried, and no physical activity were the highest risk factors for heart attack (Table 1a). 1

Among women aged 65-72: only stroke and diabetes remained as heart attack risks (Table 1b). 1

### Discussion

Although there are shared risk factors between men and women, there are also key differences in heart attack risk factors between the genders. 1

Heart attack risk factors become less predictive and change with age in both genders (Tables 1a & 2). 1

For most of the factors identified, exposure time had a large effect on overall heart attack risk (Tables 1 & 2). 1

Interactions among heart attack risk factors increased risk up to 50% in men (Figure 1), and induced risk to near 0% in men and women, even when other ‘known’ risk factors were present (Figures 1 & 2). 1

The genetic factors examined in this study were secondary to environmental factors in terms of predictability of a heart attack. 1

### References


