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IMPORTANCE OF SOCIOECONOMIC STATUS AS A PREDICTOR OF CARDIOVASCULAR OUTCOME AND COSTS OF CARE IN WOMEN WITH SUSPECTED MYOCARDIAL ISCHEMIA:

Results from the National Institutes of Health – National Heart, Lung, and Blood Institute – Sponsored Women's Ischemia Syndrome Evaluation (WISE)

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Abstract

Background—For women, who are more likely to live in poverty, defining the clinical and economic impact of socioeconomic factors may aid in defining redistributive policies to improve healthcare quality.

Methods—The NIH-NHLBI-sponsored Women's Ischemia Syndrome Evaluation (WISE) enrolled 819 women referred for clinically-indicated coronary angiography. This study's primary endpoint was to evaluate the independent contribution of socioeconomic factors on the estimation of time to cardiovascular death or myocardial infarction (n=79) using Cox proportional hazards models. Secondary aims included an examination of cardiovascular costs and quality of life within socioeconomic subsets of women.

Results—In univariable models, socioeconomic factors associated with an elevated risk of cardiovascular death or myocardial infarction included an annual household income <$20,000 (p=0.0001), <9th grade education (p=0.002), being African American, Hispanic, Asian, or American Indian (p=0.016), on Medicaid, Medicare, or other public health insurance (p<0.0001), unmarried (p=0.001), unemployed or employed part-time (p<0.0001), and working in a service job (p=0.003). Of these socioeconomic factors, income (p=0.006) remained a significant predictor of cardiovascular

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death or myocardial infarction in risk-adjusted models that controlled for angiographic coronary disease, chest pain symptoms, and cardiac risk factors.

Low income women, with an annual household income <$20,000, were more often uninsured or on public insurance (p<0.0001) yet had the highest 5-year hospitalization and drug treatment costs (p<0.0001). Only 17% of low income women had prescription drug coverage (vs. ≥50% of higher income households, p<0.0001) while 64% required ≥2 anti-ischemic medications during follow-up (as compared to 45% of those earning ≥$50,000, p<0.0001).

Conclusions—Economic disadvantage prominently affects cardiovascular disease outcomes for women with chest pain symptoms. These results further support a profound intertwining between poverty and poor health. Cardiovascular disease management strategies should focus on policies that track unmet healthcare needs and worsening clinical status for low income women.

Keywords

Gender; Socioeconomic Status; Health Policy; Coronary Artery Disease; Cost

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Socioeconomic status is inversely related to cardiovascular outcome with lower strata patients having worse cardiac risk factors profiles and higher case fatality rates (1-6). Although age, ethnicity, and gender are significant covariates acting within this association of socioeconomic status to outcome, research within females has largely focused on the impact of social support, networks, and strain on patient well-being (7-10). For women, measurement of the impact of socioeconomic factors to the estimation of cardiovascular prognosis and quality of life is important for the design of sex-specific focused interventions for lower socioeconomic strata individuals (11). Limited data are available in female cohorts as to the interplay amongst socioeconomic factors including income, education, employment status, and health insurance coverage and their impact on adverse cardiovascular outcomes, including quality of life and resource consumption patterns (2,12).

Thus, the aim of the current report was to explore the relative contribution of multiple socioeconomic factors as estimators of major cardiovascular events and quality of life in 819 women prospectively enrolled in the NIH-NHLBI-sponsored Women's Ischemia Syndrome Evaluation (WISE). Moreover, a secondary aim was to evaluate cardiovascular costs across socioeconomic subsets of WISE women.

METHODS

Patient Entry Criteria

The WISE study methods were previously reported (13-14). In brief, women enrolled in WISE included those presenting for evaluation of chest pain symptoms and referred for clinically-indicated coronary angiography. All women had signs and symptoms suggestive of myocardial ischemia prior to enrollment in WISE. Of a consecutive series of 7,603 women, 936 were enrolled in the WISE. The reporting of income was voluntary and not available in 117 women; clinical characteristics for those without income data were similar to the 819 included herein. All study procedures and follow-up methodologies were approved by each center's investigational review board.

Baseline Evaluation (Table 1)

Detailed demographic and medical history characteristics were collected. Blood pressure and heart rate were recorded at study entry. Other cardiovascular risk marker data were collected including lipid measurements and body mass index.

Quality of Life Measurements

Data on patients' self-reported quality of life, health, satisfaction, and well-being were collected (15). Functional disability was scored using the Duke Activity Status Index (DASI) estimated metabolic equivalents (METs) (16). The DASI is a 12-item questionnaire that documents patient's self reported difficulties in routine activities of daily living (e.g., vacuuming), self care (e.g., bathing), abilities to ambulate, and recreational activities.

Socioeconomic Status

Socioeconomic factors collected were ethnicity, marital status, highest level of education, retirement status, employment and vocational status, disability status, income, and health insurance coverage (17). Health insurance coverage included primary and supplemental plans. Household income was categorized as <$20,000 (n=308), $20,000-$49,999 (n=352), $50,000-$99,999 (n=124), and ≥$100,000 (n=35). For comparative purposes, low income women are defined as those with an annual household income of <$20,000 versus higher income women.

For education, 3 groups included: post-high school vocational or college education (n=360), 9^{th}-12^{th} grade or general equivalency diploma (n=489), or <9^{th} grade (n=51). Within WISE, 739 were Caucasian, non-Hispanic, 161 were Black or African American, and 11 patients were Hispanic, Asian, American Indian, or Alaskan Native. Marital status included: married (n=523), divorced, separated, widowed, living in a marriage-like situation (n=337), or never married (n=47).

Angiography Core Laboratory

The extent of coronary disease was defined as the number of vessels with ≥50% stenosis (18).

Follow-up Outcomes

Patients were contacted at 6 weeks and then yearly for 5 years of follow-up. During contact, a scripted interview was used to ascertain cardiovascular hospitalizations or death. Death certificates or medical records were independently reviewed to determine causality. Data on medication use, office or community health clinic visits, cardiac procedures was collected.

Collection of Cardiovascular Costs

The WISE cost methodology has been previously published (19). Briefly, total cardiovascular costs were summed using standard approaches including 5% annual discount rate and inflation-correction based on the US medical service sector estimate (city average) of the consumer price index (for urban wage earners and clerical workers) (19). Five-year costs for cardiovascular hospitalizations, emergency department visits, coronary revascularization and angiography, outpatient testing, and visits to generalist, specialists, nurse practitioners/physician's assistant, or community clinics were summed. Indirect cost data was estimated based on hours lost from work due to health care, reduced productivity hours, transportation costs to the doctor or hospital, and out-of-pocket costs for drugs, medical devices (e.g., glucometer), and alternative therapies (e.g., vitamins).

Statistical Analysis

Descriptive statistics included comparisons of categorical variables by χ^2 statistic or continuous variables using analysis of variance techniques. Quality of life measurements were compared by socioeconomic subsets using a χ^2 statistic; with exception, the DASI was compared using analysis of variance techniques. The mean±standard deviation DASI METs were plotted over time using a trendline fitted with a polynomial function.

Our prognostic modeling was performed in several stages. We first evaluated the univariable prediction of various socioeconomic factors. Our next step was to consider the independent contribution of socioeconomic factors above and beyond clinical variables including chest pain symptoms, angiographic coronary disease, cardiac risk factors, and body mass index. Our final evaluation included a stepwise model to provide some inference about the relative importance or rank of socioeconomic factors in relation to clinical variables (including chest pain symptoms, angiographic coronary disease, cardiac risk factors, and body mass index). The specifics of our statistical analyses are as follows: Time to cardiovascular death or myocardial infarction was estimated using univariable and multivariable Cox proportional hazard models. From the Cox model, unadjusted survival curves were plotted. Risk-adjusted models included socioeconomic variables plus the following clinical covariates: angiographic coronary disease, cardiac risk factors, symptoms, and body mass index. Model overfitting procedures were considered by limiting the number of variables included in any given model to only 1 for every 10 outcomes. Moreover, the proportional hazards assumption was met for all survival analyses. Relative risk ratios (95% confidence intervals [CI]) were calculated. Stepwise Cox regression modeling was employed to identify the single greatest socioeconomic estimators of outcome. This latter model included socioeconomic and clinical variables included within the risk-adjusted model stated above.

Costs were compared for women by income subsets using general linear modeling techniques adjusted by the DASI estimate of METs, as a surrogate for disability. Further risk adjustment by including age or angiographic coronary disease did not influence the results presented herein.

A post-hoc sample size calculation revealed that there was sufficient power to detect differences in survival across income subsets ($\beta \geq 0.80$, $\alpha = 0.05$, 2-tailed) (Power and Precision,™ v. 2.0). We specifically compared cardiovascular event-free survival, defined as cardiovascular death or nonfatal myocardial infarction, as reported in Figure 2 for women with an annual household income of ≥$50,000 as compared to those in the low income strata of < $20,000.

RESULTS

Clinical Characteristics of the WISE Women by Household Income (Table 1)

Women earning <$20,000 per year (i.e., low income) had a greater degree of comorbidity and symptom burden including more typical angina (p=0.050) and angiographic coronary disease (p=0.032).

Fewer women from low income households were married as compared with women with a household income of $50,000 or more (p<0.0001). Additionally, approximately 1 in 3 low income women were Black while less than 1 in 10 higher income women were non-Caucasian (p<0.0001). Additionally, 24% of women earning <$20,000 per year as compared to nearly 7 out of 10 women earning ≥$50,000 had post-high school training or education (p<0.0001). Full-time employment was reported in 14%, 31%, 38%, and 43% of women reporting income <$20,000, $20,000-$49,999, $50,000-$99,999, and ≥$100,000, respectively (p<0.0001).

Quality of Life Measurements by Household Income (Table 2 and Figure 1)

Women from low income households more often perceived their health as fair-poor (p<0.0001) and had a reduced perceived quality of life (p<0.0001). Finally, nearly half of low income women were living alone while none of the women in higher household income strata (i.e., > $20,000) lived alone (p=0.0003).

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Low income women had reduced physical functioning (as measured by decreased DASI estimated METs, Figure 1) ($p<0.0001$). The DASI score was approximately 3 METs lower for women with an annual income <$20,000 as compared to those earning ≥$50,000 per year ($p<0.0001$). Nearly half of low income women stated that they had trouble walking one to two blocks on level ground ($p<0.0001$) and 80% noted difficulties in climbing a flight of stairs or walking up hill ($p<0.0001$).

The average MET value for low income women started at 4.1 declining to 3.3 at 5 years of follow-up (Figure 1). At baseline and throughout follow-up, higher income women achieved greater DASI estimated METs ($p<0.0001$). For women with an annual household income of ≥ $50,000, their DASI scores ranged from 6.8-8.4 METs during follow-up.

Univariable Estimators of Outcome (Table 3)

At 5.0±2.6-years of follow-up, 79 women died secondary to cardiovascular disease or were hospitalized for an acute myocardial infarction. Female subsets at highest risk (i.e., significant univariable estimators) included women with annual household income <$20,000 ($p<0.0001$), employed < full time ($p<0.0001$), on publically-funded health insurance ($p<0.0001$), <9th grade education ($p=0.002$), in service positions ($p=0.006$), being African American, Hispanic, Asian, or American Indian ($p=0.008$), or unmarried ($p=0.022$).

Cardiovascular event-free survival at 5 years was 99%, 97%, 87%, and 82%, respectively, for household income levels of ≥$100,000, $50,000 to $99,999, $20,000 to $49,999, and <$20,000 (Figure 2, $p=0.001$). For women with varying education, those at greatest risk included women who did not enter high school with 77% cardiovascular event-free survival at 5 years (Figure 3, $p=0.002$). Women with some post-high school education including college coursework or vocational training had a 5-year cardiovascular event-free survival of 94%. Higher cardiovascular event-free survival was reported for women working full-time as compared to those unemployed or working part-time (98% vs. 90%, $p<0.0001$).

Risk-Adjusted Prognostic Models

In a multivariable model evaluating socioeconomic factors, income ($p=0.001$) followed by education ($p=0.012$) were the greatest predictors of cardiovascular death or myocardial infarction. The relative risk ratio was 4.91-fold higher for women with an annual household income of <$20,000 as compared to those higher income strata (Table 3, $p<0.0001$). Moreover, the relative risk ratio for women without any post-high school training or education was elevated 3.51-fold as compared to women with at least some education or training beyond high school (Table 3, $p=0.002$).

However, when controlling for angiographic coronary disease, symptoms, body mass index, and risk factors, income ($p=0.006$) remained a significant predictor of cardiovascular death or myocardial infarction. As expected, angiographic coronary disease extent was the single greatest predictor of prognosis in a multivariable Cox model that included body mass index, symptoms, and cardiac risk factors ($p<0.0001$). Income ($p=0.001$), however, was the second greatest estimator of cardiovascular death or myocardial infarction.

Risk-Adjusted Cardiovascular Costs and Resource Consumption Patterns by Household Income

Nearly half of women earning <$20,000 were hospitalized for worsening or refractory chest pain symptoms as compared to 30% to 40% of higher income women (Figure 4, $p=0.01$). Despite this, follow-up angiography ($p=0.60$) or coronary revascularization ($p=0.42$) rates were similar by income (Figure 5). Due to their greater angina burden, nearly 70% of low income women required ≥2 anti-ischemic medications for chest pain symptoms during follow-up as compared to only half of higher income women (p=0.002). In fact, 18% of low income women required the use of ≥2 anti-ischemic medications for 4 out the 5 years of follow-up.

The result being higher 5-year risk-adjusted costs for low income women (Figure 6, p<0.0001). For women from low income households, total 5 years cardiovascular costs exceeded $40,000 with $9,775 being 5-year indirect costs. This may be compared to 5-year total costs of $23,132 and indirect costs of $10,107 for women with an annual household income of $100,000 or more. Concurrent with the reported greater frequency of medication usage, only 17% of women with incomes <$20,000 had prescription drug coverage; this rate increased to nearly half having drug coverage for those earning ≥$20,000 per year (p<0.0001). Indirect costs were similar across household incomes averaging $1,827 per year but represented 18%, 6%, 2%, and 2% of total household incomes for women earning <$20,000, $20,000-$49,999, $50,000-$99,999, and ≥$100,000, respectively (p<0.0001).

DISCUSSION

Women comprise a disproportionate share of those having limited financial means. The current results reveal an intertwining of socioeconomic factors with key subsets at particularly high risk for worsening cardiovascular prognosis including non-Caucasian, unmarried women with limited education. However, of all the socioeconomic factors, income was the most prominent and independently contributed to worsening cardiovascular event-free survival. Those at highest risk included women with an annual household income <$20,000 with a 5-year cardiovascular event-free survival rate of 82% as compared to 97%-99% survival rates for women earning $50,000 or more per year. The resulting relative risk ratio was elevated nearly 5-fold for low income women as compared to those with an annual household income of $50,000 or more (p<0.0001). Although there is limited data in women, these results are consistent with prior findings noting socioeconomic factors as contributory to greater coronary heart disease risk (20-24).

Activities of Daily Living for Low Income Women

The current study also examined quality of life in addition to the prognostic findings. From this WISE cohort, more than half of low income women perceived their health status as fair-poor as compared to only 1 in 10 females from higher income households. Moreover, low income women reported greater functional disability when compared to females from higher income households. From the yearly DASI questionnaire, low income women reported their average estimated METs capacity was 4.1 following one year of follow-up. Approximately 4-5 METs of physical work capacity is required to perform routine household chores. Thus, low income women were largely incapable of minimal activities of daily living (15). Further deterioration in MET capacity was reported through 5 years of follow-up such that low income women, on average, were only able to perform 3.3 METs of physical work while females from higher income households reported functional capabilities in the range of 7-8 METs. The DASI is a simple 12-item questionnaire where estimation of METs can provide information not only of physical work capacity but the score correlates very well with long-term outcomes in women (15). Thus, the DASI may provide a means to document a patient's limitations in performing routine activities of daily living with a DASI estimated METs of 4.7 or less being at highest risk.

Cardiovascular Resource Consumption and Costs in Women from Low Income Households

Low income women consumed more healthcare resources and had higher cardiovascular healthcare costs during follow-up. This would be expected given the higher risk status, greater risk factor burden, and more prevalent coronary disease for the women from low income households. Importantly, cost differences between women of low to high household incomes result in a selection bias. That is, women from low income households with more angina symptoms and more coronary disease would be expected to have higher costs of care. That being said, the presentation of cost data is meant to define the tremendous financial burden of healthcare for our low income women.

Prior results have reported that a lack of available financial resources for lower income patients limits regular healthcare access resulting in an underuse of preventive services and therapeutic interventions contributing to worsening outcome (25-26). Within WISE, low income women with a greater angina burden required more anti-ischemic therapies yet frequently had inadequate health insurance coverage. In fact, out-of-pocket expenses for healthcare encumbered 18% of household incomes for those earning <$20,000 as compared to only 2% of higher income households. The current results are similar to national results noting that nearly 1 in 5 families spend more than 10% of their annual incomes on health care (29). Those at highest risk of incurring hefty health care expenses include low income individuals with chronic medical conditions, similar to our women with angina.

It is also likely that a lack of prescription drug coverage had an undocumented influence on medication adherence and refilling (28). This financial burden for low income women could be even greater with the inclusion of unfilled prescriptions; although this information was unavailable within WISE. Additionally, low income women also reported more sick days and diminished work productivity that further compromise their take home salary and perhaps led to higher rates of job strain. Prior reports have noted that job strain accelerates coronary disease risk (27).

Moreover, for low income women, medical management was often ineffective with nearly half requiring hospitalization for refractory or worsening angina suggesting unmet healthcare needs. Although there appeared to be more intensive use of anti-ischemic therapies for low income women, the greater burden of angina and higher risk status suggests an underutilization of invasive, secondary prevention measures. That is, the similar utilization rates for repeat angiography and follow-up coronary revascularization could, in fact, be an underuse of services for the higher risk, more symptomatic, women of low income households. Several prior reports have documented lower utilization rates for coronary revascularization in lower income patients (36-41). Consistent with the current data, the literature supports the hypothesis that unmet health needs for low income patients contributes to worsening prognosis (25,26, 29-37).

Study Limitations

Poverty status data could not be calculated due to the lack of information on regional home location and the number of adult and children living within each household (41-42). Although urban and rural housing data was not available on a patient level basis, the vast majority of patients in the lowest income bracket (i.e., 72%) were enrolled from 2 centers (Gainesville, Florida and Birmingham, Alabama, p<0.0001); perhaps residing in more rural environments as compared with other study participants. Although urban versus rural living data was unavailable, the inclusion of enrolling center as a marker for regional variation did not change the current results. A significant limitation to the current manuscript is the lack of detail about differences in treatment including the intensity of anti-ischemic therapy use across the participating centers. Across center differences in patient management, the use of varying physician specialty or generalists care may be confounding the current results. This latter factor may be operational and result in an incorrect assessment of the impact of income and other socioeconomic factors. Specific information on provider training and experience was not available and could have influenced the results presented herein. We cannot exclude the possibility that a type I error occurred resulting from the extensive modeling performed within this analysis. Although the significance level of income was small suggesting that the false positive rate for our primary comparisons may be minimal. Finally, as the WISE study is an observational cohort design, no specific causal pathway may be identified within our available socioeconomic, clinical, or quality of life data.

Conclusions

Although prior reports have delineated the health effects of socioeconomic disadvantage (1-4), limited evidence is available on women (7,9). Our data suggests that, among a variety of socioeconomic factors, income is the strongest estimator of cardiovascular morbidity and mortality. This evidence indicates that both affordability and accessibility may be operationally limiting our subset of low income women.

The current results also reveal the complex interrelationship between poverty and poor health. Women from low income households were not only at heightened risk of cardiovascular events but required more intensive cardiac resources for management of their cardiac symptoms. Higher rates of hospitalization for worsening chest pain along with greater anti-ischemic therapy usage revealed their worsening symptom burden; including a greater reliance upon medical management. However, similar utilization patterns for outpatient visits and cardiac procedures coupled with their worsening prognosis signify unmet healthcare needs. For women from low income households, limited financial means should also be framed within the context of deficiencies in health care coverage. Few of our low income women had group health insurance coverage; patients identified as incurring heavy health care expenditures (29). Improved health insurance coverage for women from low income households has the potential to shift care from out-of-pocket expenses to that covered by group policies and, perhaps, to reduce global cardiovascular costs by more effective management of low income women. Thus, redistributive policies targeted toward breaking the cycle of excessive health care costs with policies of effective disease management for low income women should be evaluated. Near term implications for these results should be a greater targeting of low income women within the healthcare system and better tracking of drug compliance, prescription filling, as well as serial evaluation of their symptoms and functional capacities may serve to focus primary care physicians on their at-risk status. These results are generalizable to a large cohort of female patients where nearly half of middle-aged to elderly women comprise this lower income stratum.

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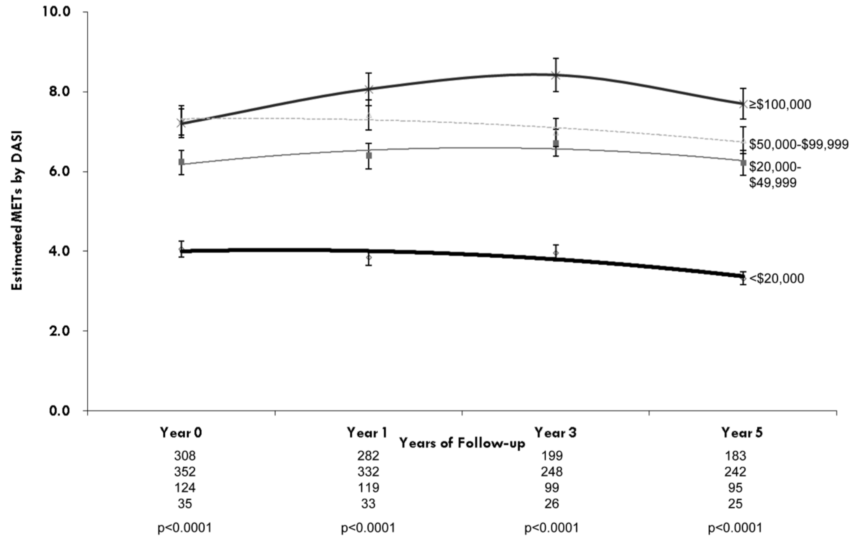

Abbreviations: MET=Metabolic Equivalent, DASI= Duke Activity Status Index.

Figure 1.

Estimated Metabolic Equivalents (METs) (average±standard deviation) by the Duke Activity Status Index (DASI) at Baseline Through 5 Years of Follow-up by Household Income from < $20,000, $20,000-$49,999, $50,000-$99,999, and ≥$100,000, respectively. The line of best fit between baseline and through 5 years of follow-up was fit with a polynomial function.

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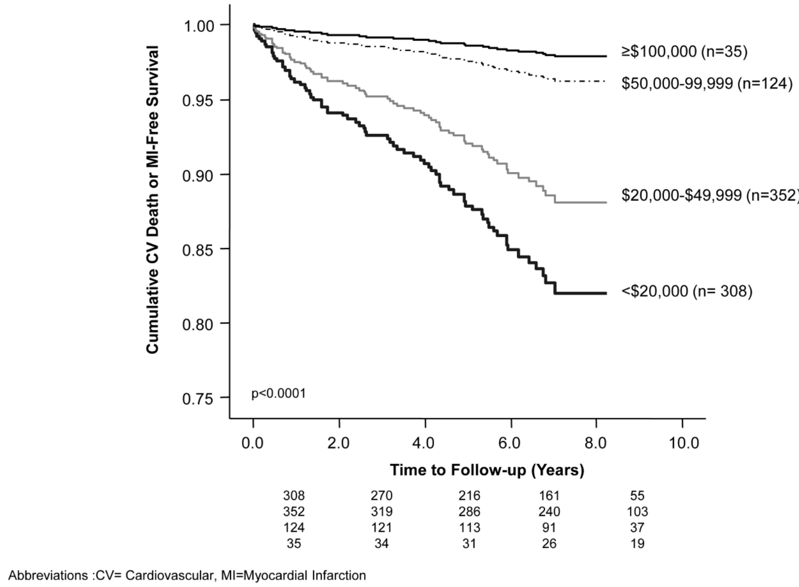

Figure 2.
Survival Free from Cardiovascular Death or Non-Fatal Myocardial Infarction by Annual Household from <$20,000, $20,000-$49,999, $50,000-$99,999, and ≥$100,000, respectively.

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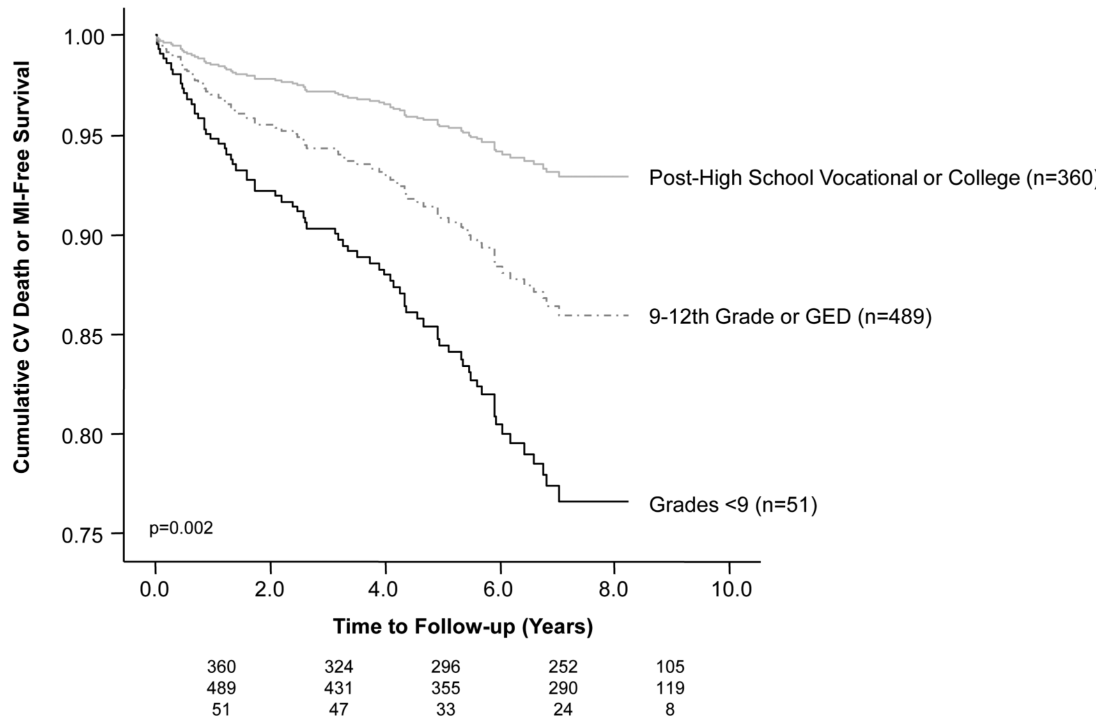


Abbreviations :CV= Cardiovascular, MI=Myocardial Infarction, GED=General Educational Development Diploma .

Figure 3.
Survival Free from Cardiovascular Death or Non-Fatal Myocardial Infarction by Education Including Women Attending School Up Until High School, Those Having Some High School Education, and Those Having Some Post-High School Training, respectively.

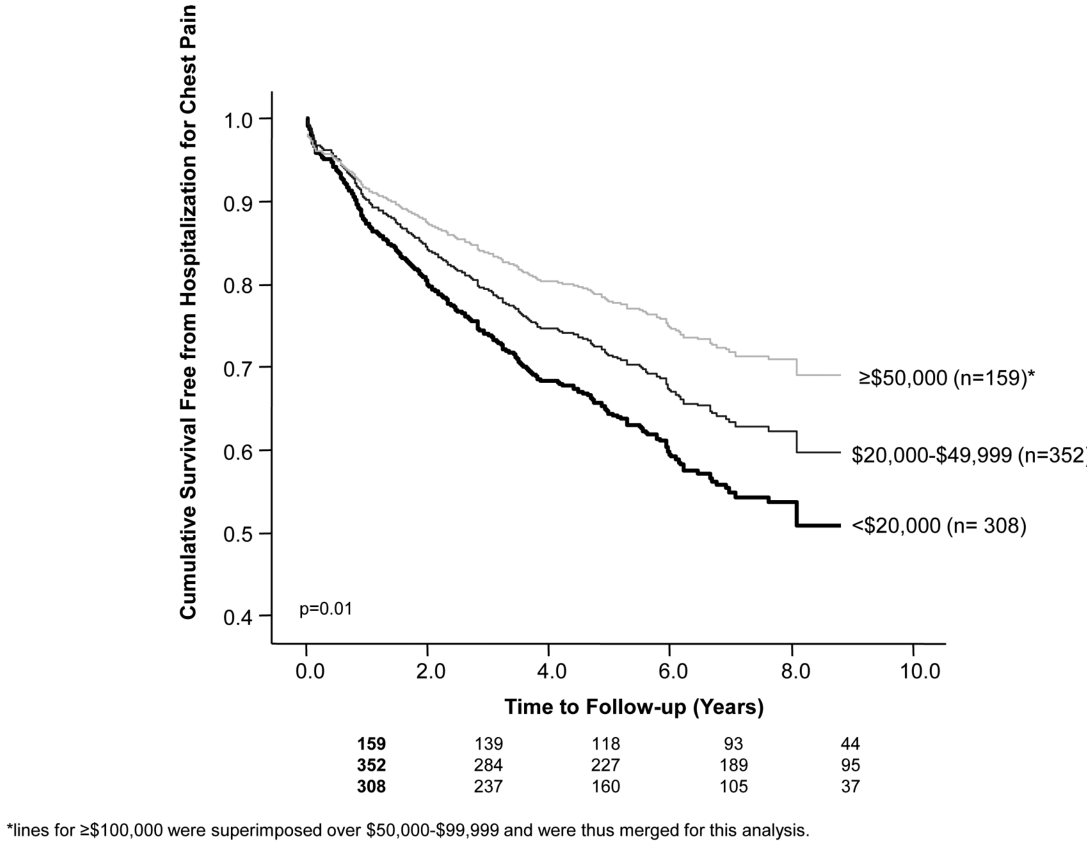
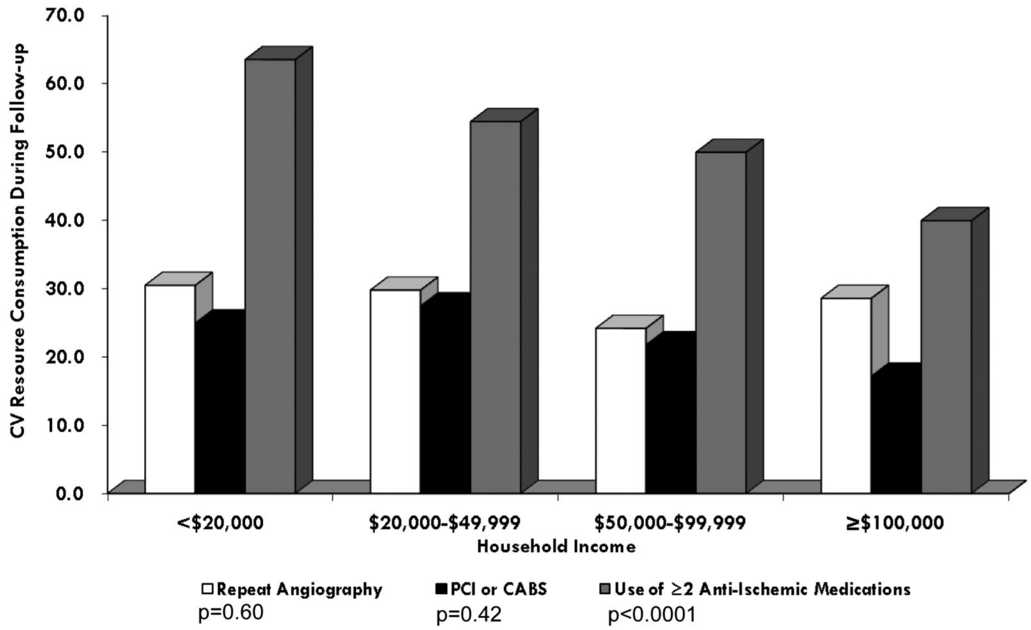


Figure 4.

Survival-Free From Hospitalization for Worsening Chest Pain Symptoms by Household Income.



Abbreviations: CV=Cardiovascular, PCI or CABS=Percutaneous Coronary Intervention or Coronary Artery Bypass Surgery; *Use of≥ 2 Anti-Ischemic Medications recorded use at any time during follow-up.

Figure 5.

Use of Cardiac Procedures During Follow-up Including Repeat Coronary Angiography and Coronary Revascularization Procedures (PCI or CABS) And Recorded Use of ≥2 Anti-Ischemic Medications During Follow-up.

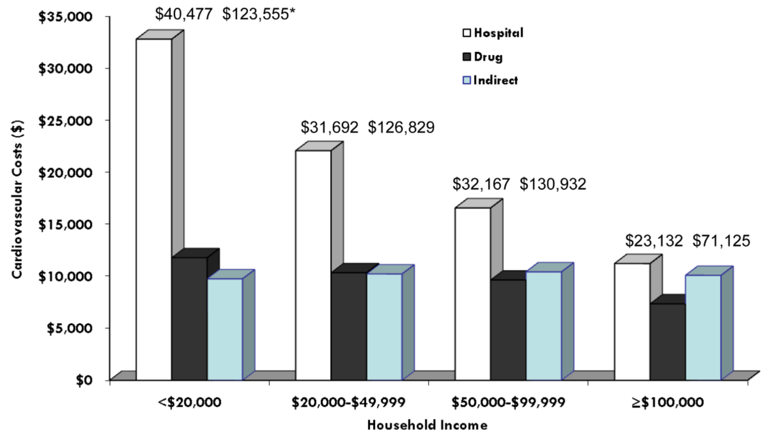


Figure 6.
Five-Year Hospital (p<0.0001) and Drug (p<0.0001) Costs by Annual Household Income. Also included are 5-year indirect costs which were similar across household incomes (p=0.76). All cost estimates were adjusted for the DASI estimate of MET capacity as a surrogate for disability. Further risk-adjustment using age and angiographic coronary disease did not change these results.

Table 1

A Comparison of Baseline Clinical History and Socioeconomic Measurements by Annual Income Levels

	<$20,000 (n=308)	**$20,000-$49,999 (n=352)**	**$50,000-$99,999 (n=124)**	**≥$100,000 (n=35)**	**p value**
Age (in years) mean±standard deviation (range)	58.6±11 (21-83)	58.6±12 (27-86)	56.2±11 (33-82)	55.6±9 (40-79)	0.096
Post-Menopause	78%	73%	72%	66%	0.70
Cardiac Risk Factors and Cardiometabolic Syndrome					
Hypertension	66%	61%	44%	31%	<0.0001
Diabetes	32%	23%	18%	9%	<0.0001
Current Smoker	26%	17%	15%	6%	0.021
Body Mass Index (kg/m^2)	31±7	30±7	28±6	29±6	0.006
Metabolic Syndrome	55%	44%	37%	33%	0.009
Comorbid Conditions					
Cerebrovascular Disease	15%	8%	4%	6%	0.001
Renal Dysfunction	5%	2%	1%	0%	0.014
Depression Requiring Treatment	32%	21%	17%	26%	0.002
Alcohol Use	8%	16%	21%	26%	<0.0001

	<$20,000 (n=308)	$20,000-$49,999 (n=352)	$50,000-$99,999 (n=124)	≥$100,000 (n=35)	p value
Presenting Cardiac Symptoms					
Typical Angina	35%	26%	33%	20%	0.050
Dyspnea on Presentation	70%	48%	53%	49%	<0.0001
Prior Stress Testing, Anti-Ischemic Therapy Use, and Angiographic Results					
Positive Stress Test	36%	50%	56%	57%	<0.0001
Nitroglycerin Use	59%	40%	37%	36%	<0.0001
Angiographic CAD					0.032
No 50% Stenosis	59%	61%	66%	71%	
1 Vessel	19%	15%	13%	27%	
2-3 Vessel	23%	24%	21%	2%	
Socioeconomic Factors					
Ethnicity					<0.0001
Black	31%	13%	3%	6%	
Hispanic, Asian, or Indian*	1%	1%	3%	0%	
White	68%	86%	95%	91%	
Marital Status					<0.0001
Never Married	8%	5%	0%	0%	
Divorced / Separated	29%	13%	4%	0%	
Widowed	27%	16%	3%	0%	
Presently Married	32%	65%	90%	100%	
Living in a Marriage-Like Relationship	4%	3%	3%	0%	

	<$20,000 (n=308)	$20,000-$49,999 (n=352)	$50,000-$99,999 (n=124)	≥$100,000 (n=35)	p value
Education					<0.0001
< High School Diploma	38%	11%	3%	0%	
High School Diploma	38%	47%	31%	17%	
Some College / Vocational Training	19%	31%	32%	34%	
College Graduate or Higher	5%	11%	34%	49%	
Health Insurance					<0.0001
Medicare	44%	24%	22%	0%	
Other Public**	18%	5%	2%	9%	
Private	25%	69%	76%	91%	
None / Self-Pay	13%	2%	0%	0%	
Employment Status***					
Full-Time	14%	31%	38%	43%	<0.0001
Part-Time	5%	8%	13%	14%	<0.0001
Retired	33%	32%	26%	20%	<0.0001
Disabled***	31%	14%	6%	0%	<0.0001

Clinical Definitions: Post-Menopause was defined by at least 12 months of amenorrhea or prior bilateral salpingo-oophorectomy; Metabolic syndrome was defined as any 3 of the following: waist circumference >35 inches, triglycerides ≥150 mg/dl, HDL cholesterol <50 mg/dl, hypertension, and fasting glucose ≥110 mg/dl.

For Socioeconomic Factors:

* Precise definition for Ethnicity includes Hispanic, Asian or Pacific Islander, American Indian or Alaskan Native.

** Other Public Insurance = Medicaid or Civilian Health and Medical Program of the Uniformed Services (CHAMPUS).

*** Subsets within Employment Status are not exclusive; affirmative responses may be included within multiple categories. Within these categories are the term disabled. The term disabled is defined as those receiving social security disability benefits.

Table 2

Quality of Life Measurements at Study Entry by Household Income

	<$20,000 (n=308)	**$20,000-$49,999 (n=352)**	**$50,000-$99,999 (n=124)**	**≥$100,000 (n=35)**	**p value**
Functional Disability Defined as Estimated DASI METs* <4.7	31%	13%	6%	0%	<0.0001
Fair-Poor Perceived Health	57%	34%	21%	12%	<0.0001
Low Perceived Quality of Life**	10%	6%	4%	3%	<0.0001
Health Impairs Work or Lost Days from Work Due to Health	81%	77%	40%	60%	0.023
History of Psychosocial Stress	34%	31%	33%	49%	0.204
Living Alone at 5-Yrs of Follow-up	45%	0%	0%	0%	0.003

* DASI METs = Duke Activity Status Index Estimate of Metabolic Equivalents.

** Perceived quality of life ranged from 0-3 out of 10 with 10 being excellent.

Table 3

Socioeconomic Factors Predictive of Cardiovascular Death or Nonfatal Myocardial Infarction in Unadjusted and Risk-Adjusted* Cox Proportional Hazards Models

	Unadjusted Relative Risk (95% CI)	Unadjusted model χ^2, p value	Risk-Adjusted* Relative Risk (95% CI) p value
Income Level <$20,000 vs. ≥$50,000	4.91 (2.11-11.44)	χ^2=23, p<0.0001	4.76 (1.68-13.45) p=0.006
Full-Time Employment Part-Time Employment or Unemployed vs. Full-Time Employment	4.33 (2.00-9.35)	χ^2=16, p<0.0001	3.98 (1.59-9.97) p=0.001
Education 9th – 12th Grade, GED or <9th Grade vs. Post-High School**	3.51 (1.76-6.99)	χ^2=12, p=0.002	2.84 (1.33-6.06) p=0.017
Ethnicity Black, Hispanic, Asian/Pacific Islander, or American Indian/Alaskan Native vs. Caucasian, non-Hispanic	1.77 (1.13-2.77)	χ^2=10, p=0.008	1.49 (0.90-2.51) p=0.13
Insurance Status Public** or No Health Insurance vs. Private HMO / PPO	3.27 (1.72-6.21)	χ^2=16, p<0.0001	2.13 (1.0-4.52) p=0.054
Marital Status Divorced, Separated, Living in a Marriage-Like Situation, or Never Married vs. Married	2.51 (1.23-5.14)	χ^2=8, p=0.022	2.41 (1.12-5.20) p=0.06
Retired Retired vs. Not Retired	1.62 (1.07-2.44)	χ^2=5, p=0.023	1.46 (0.91-2.35) p=0.213
Vocation			
Service Job Service vs. non-Service Job	1.79 (1.18-2.71)	χ^2=8, p=0.006	1.51 (0.94-2.41) p=0.06
Non-Technical Job Non-Technical vs. Technical Job	1.93 (1.03-3.62)	χ^2=4, p=0.037	2.13 (0.98-4.67) p=0.086
Non-Managerial Job Non-Managerial vs. Managerial Job	1.60 (0.95-2.67)	χ^2=3, p=0.071	1.43 (0.80-2.52) p=0.244

Table Abbreviations or Acronyms: CAD=Coronary Artery Disease, GED = General Educational Development Diploma, HMO = Health Maintenance, PPO = Preferred Provider Organization.

* Risk-Adjusted by Angiographic CAD Extent, Cardiac Symptoms, Cardiac Risk Factors (smoking, age, hypertension, hyperlipidemia, and diabetes), and body mass index.

** Public Insurance = Medicare, Medicaid, or Civilian Health and Medical Program of the Uniformed Services (CHAMPUS).

*** Post-High School = Vocational Training, Classes Toward or Completion of an Associate's or Baccalaureate Degree or Higher.