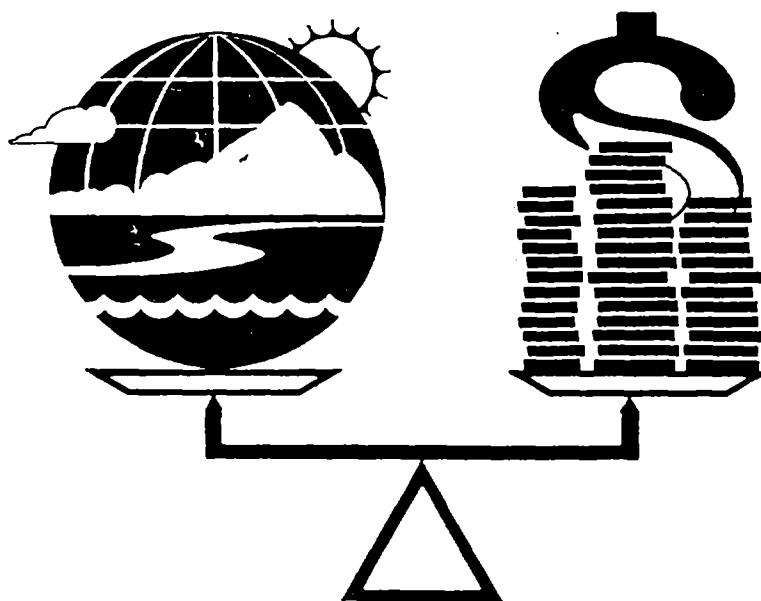




Heart Disease Patients Averting Behavior, Costs of Illness, and Willingness to Pay to Avoid Angina Episodes



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HEART DISEASE PATIENTS' AVERTING BEHAVIOR,
COSTS OF ILLNESS, AND WILLINGNESS TO PAY
TO AVOID ANGINA EPISODES

FINAL REPORT TO
OFFICE OF POLICY ANALYSIS
U.S. ENVIRONMENTAL PROTECTION AGENCY

OCTOBER, 1988

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EXECUTIVE SUMMARY

Background and History: Cardiac Health Symptoms and Carbon Monoxide Exposure

The University of California, Irvine has been examining the relationship between community exposure to carbon monoxide and the occurrence of cardiac health symptoms, including angina pectoris, in male research subjects with demonstrable ischemic heart disease (atherosclerotic disease of the coronary arteries which impairs blood flow to the heart muscle). During January to May 1985, ischemic heart disease subjects carried electronic monitors to measure personal exposure to carbon monoxide during their normal course of daily activity. Carbon monoxide exposure profiles and biological monitoring demonstrated that heart disease subjects frequently encountered carbon monoxide in the urban environment and at times developed blood levels of carboxyhemoglobin which have been observed in clinical studies to aggravate angina symptoms.

In July 1985 it was recognized that the study's large data base and intact subject pool offered the opportunity for research on defensive behaviors and expenditures made by heart disease subjects in an effort to avoid angina. This led to a cooperative agreement between the U.S. Environmental Protection Agency Office of Policy Analysis, University of California, Irvine, and RCG/Hagler Bailly, Inc. (formerly Energy and Resource Consultants) to demonstrate the feasibility of placing a value on the cost of angina and related cardiac symptoms. Using the established pool of heart disease subjects, willingness to pay to avoid angina episodes was to be elicited, using contingent valuation methods. Information on the cost of

illness related to ischemic heart disease and associated symptoms was collected and compared to what subjects were willing to pay to avoid those episodes. In addition, information was obtained regarding defensive expenditures and behaviors undertaken to avoid or reduce angina symptoms. This report presents the results of this cooperative pilot study. Due to the small, nonrandom sample and exploratory nature of the study design, the results should be interpreted as suggestive only and are intended to guide the design of future research efforts.

Theoretical Framework for Evaluating the Impacts of Carbon Monoxide Exposure on Ischemic Heart Disease Patients

We have developed a framework for assembling many of the components required for the evaluation of the impacts of carbon monoxide exposure on ischemic heart disease patients who experience angina pain.

Chapter 2 contains a review of previous work on the adverse health effects of carbon monoxide on ischemic heart disease patients and the methods used in the University of California, Irvine community exposure study.

A theoretical structure which can be used to evaluate different carbon monoxide standards is also presented in Chapter 2. The basis of this approach is an economic model of individual behavior, in which a person's utility is assumed to be a function of health and the goods or services he consumes. The level of a person's health is modeled as a function of defensive expenditures, pollution exposure, and the biological, social and economic characteristics of the person. It is assumed that a person maximizes utility, which is constrained by available income. Income may be deflated by previous medical expenses and by wages lost through loss of work. This economic model of

individual behavior, when aggregated over a number of individuals, can be used to determine levels of utility for the population resulting from certain carbon monoxide emission standards.

Study Design

Chapter 3 describes the survey methods used to elicit economic information from the 50 subjects in the study. Information on demographics and the adverse effects of angina were obtained by telephone interviews. The adverse effects included time spent sick, lost days of work, partial or full loss of employment, medical expenditures made in response to illness, rankings of the relative bothersomeness of the effects of angina/heart disease, willingness to pay to avoid additional angina, and defensive expenditures and activities.

Results

Chapter 4 contains the survey results and the analysis of the personal carbon monoxide exposure data. Using multiple measures, the results converge on a picture of ischemic heart disease and associated angina as a burdensome state of health, with substantial medical costs, loss of opportunities to earn wages, psychological burdens, and expenditures to avoid further adverse health effects. The results for each type of impact are summarized below.

Cost of Illness

Annual out-of-pocket medical expenditures due to ischemic heart disease for the study subjects averaged \$256 per person. This included out-of-pocket cost of treatment and medication, and travel to the physician's office. Other annual medical expenditures incurred by any source (including the Veterans Administration hospital, private insurers, but not the individual) averaged

\$4,523 per person. Annual loss of wages due to sick days or partial or full loss of employment due to the illness and associated symptoms averaged \$9,581 per person. The total annual cost of expenses and lost earnings thus averaged \$14,359 per person. Costs for the "latest angina incident" were reported to be zero or a few cents. Regression analysis suggested no relationship between total reported costs and the rate of angina incidents, reflecting the probable unsuitability of using a COI measure to value changes in angina frequency and intensity.

Lifestyle and Emotional and Physical Effects

In general, the subjects said that the most bothersome effects if a worsening of their condition caused an increase in angina would be decreased ability to do desired activities (recreation, chores, or work), and pain or discomfort. Patients' concern about the worry or inconvenience caused for family and friends, and the possibility of a heart attack or need for bypass surgery were also stressful. Less important, but none the less stressful, were decreased ability to work at a job (for reasons other than income), more non-medical expenses (such as paying for services), more medical treatment expenses, and lost ability to earn income.

Willingness to Pay

The mean willingness to pay to avoid additional angina was \$40 per episode among the 42 subjects who responded with a dollar amount. When respondents who gave the answer "I'd pay anything I have to avoid added angina" were coded to be equal to the highest dollar amount they had agreed to

when asked a close-ended question of the form "Would you pay \$y per month to avoid 4 (or 8) additional angina episodes per month?", the lower bound on the willingness to pay for all 49 responding subjects was \$42 per month. (The frequency of angina episodes in the sample averaged 1 per week or 4-5 episodes per month.) When those who would pay "anything" had their answers recoded to a feasible maximum amount equal to their total monthly income, the average willingness to pay was \$103 per episode.

Expenses Due to Defensive Expenditures

Subjects were asked to itemize expenditures for goods or services purchased to avoid additional angina. Twenty-one of the 50 subjects hired services (e.g., yard work, plumbing, car maintenance) or purchased goods (e.g., lawn mowers, household appliances, and new automobiles) yielding an average annual expense of \$2,151 for these 21 subjects. Sixteen of the 21 subjects estimated the number of added angina episodes they avoided by hiring the service they purchase most often or the largest purchase of a good. The average expenditure for these services or goods was \$603 for these sixteen subjects. The mean expenditure per episode for these 16 subjects was \$38 and ranged from \$3.50 to \$140. This mean may be compared to the average willingness to pay of \$28 per angina episode given by the same 16 subjects. Note that willingness to pay measures the amount a person would pay to avoid additional episodes, given that expenditures for services or equipment have already been incurred.

Activity Patterns and CO Exposure

Data on activity patterns and carbon monoxide exposure in urban locations were collected in an earlier University of California, Irvine research effort. An analysis of these data suggests that ischemic heart disease patients frequently encounter carbon monoxide in the course of their daily activities, and may develop carboxyhemoglobin levels greater than 2.5 percent, a point where aggravation of angina has been observed in clinical studies.

Conclusions

The results of this pilot study suggest that useful information for valuing changes in angina frequency can be obtained from patients with ischemic heart disease. An especially promising result was the consistency between the estimate of defensive expenditures and stated willingness to pay per angina episode avoided. As expected, evaluating changes in angina symptoms is confounded by the complexity and significance of the overall effect on the patient's life of having ischemic heart disease.

This was highlighted by the difficulty found in putting any meaningful cost of illness value on small changes in angina frequency. Specific recommendations for future research efforts are given in Chapter 4.

ABSTRACT

Angina pectoris is a specific type of chest pain associated with atherosclerotic disease of the coronary arteries. This pain is a sensation of tightness or pressure in the chest, and is induced by factors which increase the oxygen requirements of the heart tissue. These factors include physical exertion, emotional stress, and cold weather. Insufficient blood flow to the heart muscle will cause low-oxygen stress, or ischemia, which may be manifest as anginal pain. Oxygen delivery may be further impaired by exposure to the air pollutant carbon monoxide (CO), which binds strongly to hemoglobin and decreases the oxygen-carrying capacity of the blood, thereby causing episodes of angina. Regardless of the cause, recurrent anginal symptoms can reduce the quality of life, restrict activities, and cause psychological stress. But the limited quantitative information on the economic consequences of these effects has constrained the evaluation of public policies to reduce urban CO exposures. This paper presents an economic model of behavior which describes an individual's health and response to environmental pollution. In addition, a survey instrument was developed to measure the economic impacts associated with angina, and was pilot tested with a sample of 50 men with ischemic heart disease. The cost of illness was computed from information elicited on insurance premiums, medication and treatment costs and lost work time; information on expenditures for services or purchases of goods to avoid angina was also elicited. Additionally, the dollar amount that a subject was willing to pay to prevent additional angina was elicited using contingent valuation methods. The performance of the survey instrument suggests that it is feasible to elicit many of the components required in the theoretical model describing the economic behavior of people with angina pectoris who are exposed to CO.

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LIST OF ABBREVIATIONS

CABG	Coronary artery bypass graft
CO	Carbon monoxide
COHb	Carboxyhemoglobin (compound formed by the combination of carbon monoxide with hemoglobin)
COI	Cost of illness
CV	Contingent valuation
ECG	Electrocardiogram
EPA	U.S. Environmental Protection Agency
ERC	Energy and Resource Consultants, Inc.
Hb	Hemoglobin (iron-containing protein respiratory pigments occurring in the red blood cells of vertebrates and transporting oxygen to the tissues and carbon dioxide from the tissues)
IHD	Ischemic heart disease
MET	Metabolic activity unit
MI	Myocardial infarction (heart attack)
O ₂ Hb	Oxyhemoglobin
PTCA	Percutaneous transluminal coronary angioplasty, also called angioplasty
PEM	Personal exposure monitor
ppm	Parts per million
UC Irvine	University of California, Irvine
VA	Veterans Administration
WTA	Willingness to accept
WTP	Willingness to pay

CHAPTER 1. INTRODUCTION AND SUMMARY

1.1 Background and History

Since January 1985, research has been conducted at the University of California, Irvine (UC Irvine), examining the relationship between community exposure to carbon monoxide (CO) and the occurrence of cardiac health symptoms, including angina pectoris. A sample of male subjects with demonstrable ischemic heart disease, atherosclerotic disease of the coronary arteries that impairs blood flow to the heart muscle, was assembled from the patient populations of two regional medical centers in the Los Angeles and Orange County areas. During January to May 1985, ischemic heart disease (IHD) subjects carried electronic monitors to measure personal exposure to CO during their normal course of daily activity. CO exposure profiles and biological monitoring demonstrated that IHD subjects frequently encountered CO in the urban environment, and at times developed blood levels of carboxyhemoglobin (COHb) which have been observed in clinical studies to aggravate angina symptoms.

In July 1985 it was recognized that the study's large data base and intact subject pool offered the opportunity for research on defensive behaviors and expenditures made by IHD subjects in an effort to avoid angina. This led to a cooperative agreement between the U.S. Environmental Protection Agency Office of Policy Analysis, UC Irvine, and Energy and Resource Consultants (ERC) to demonstrate the feasibility of placing a value on the cost of angina and related cardiac symptoms. Using the established pool of IHD subjects, alternative measures of the value of avoiding angina

episodes were elicited, using survey research methods. Information was obtained on medical expenses, work loss, defensive expenditures, and willingness to pay to avoid angina episodes. In addition, defensive expenditures and behaviors were related to CO exposure as actually measured in an earlier community monitoring study. This report presents the results of this cooperative study.

1.2 Summary

We have developed a framework for assembling many of the components required for the evaluation of the welfare impacts of carbon monoxide exposure on ischemic heart disease patients who experience angina pain.

Chapter 2 contains a review of previous work on the adverse health effects of CO on ischemic heart disease patients and the methods used in the UC Irvine community exposure study.

A theoretical structure that can be used to evaluate different carbon monoxide standards is also presented in Chapter 2. The basis of this approach is an economic model of individual behavior, in which a person's utility is assumed to be a function of health and the goods or services he consumes. The level of a person's health is modeled as a function of defensive expenditures, pollution exposure, and the biological, social and economic characteristics of the person. It is assumed that a person maximizes utility, which is constrained by available income. Income may be deflated by previous medical expenses and by wages lost through loss of work. This economic model of individual behavior, when aggregated over a number of individuals, can be used to determine levels of utility for the population resulting from alternative carbon monoxide emission standards.

Chapter 3 describes the survey methods used to elicit economic information from the 50 subjects in the study. Information on demographics and the adverse effects of angina were obtained by telephone interviews. The adverse effects included time spent sick, lost days of work, or partial or full loss of employment, medical expenditures made in response to illness, rankings of the relative bothersomeness of the effects of angina/heart disease, willingness to pay to avoid additional angina, and defensive expenditures and activities.

Chapter 4 contains the survey results and the analysis of the personal CO exposure data. Using multiple measures, the results converge on a picture of IHD as a burdensome state of health, with substantial medical costs, loss of opportunities to earn wages, psychological burdens, and expenditures to avoid further adverse health effects. Angina is a bothersome symptom of IHD for these patients, but it was, in some cases, difficult for subjects to isolate angina symptoms from their disease as a whole. The results for each type of economic welfare measure are described separately. The results must be used with caution because the sample used for this pilot test was small and not necessarily representative of all IHD patients.

Cost of Illness

Annual out-of-pocket medical expenditures due to IHD for the study subjects averaged \$256 per subject. This included out-of-pocket cost of treatment and medication, and travel to the physician's office. Total annual medical expenditures incurred by society (including the Veterans Administration (VA) hospital and private insurers, but not the individual) averaged \$4,523 per subject. Annual loss of wages due to sick days or partial

or full loss of employment due to angina averaged \$9,581 per subject. The total annual cost of expenses and lost earnings to the subject and to society, thus averaged \$14,359 per subject across all 50 subjects. Because CO is believed to aggravate angina symptoms in patients who already have IHD, analysis was undertaken to estimate the marginal cost of small changes in angina frequency and the cost of the "latest incident." The results suggest that although the total costs associated with IHD are substantial, the marginal cost of small changes in angina is minimal.

Lifestyle and Emotional and Physical Effects

In general, the subjects reported that the most bothersome effects of an increase in angina would be decreased ability to do desired activities (recreation, chores, or work), and pain or discomfort. Subjects' concern about the worry or inconvenience caused to family and friends, and the possibility of a heart attack or need for bypass surgery were also important. Less important, but still bothersome, were decreased ability to work at a job (for reasons other than income), more non-medical expenses (such as paying for services), more medical treatment expenses and loss of ability to earn income.

Willingness to Pay

The mean willingness to pay to avoid angina was \$40 per episode among the 42 subjects who responded with a dollar amount. When respondents who gave the answer "I'd pay anything I have to avoid added angina" were coded to be equal to the highest dollar amount they had agreed to when asked a close-ended

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Expenses Due to Defensive Expenditures

Subjects were asked to itemize expenditures for goods or services purchased to avoid additional angina. Twenty-one of the 50 subjects hired services (e.g., yard work, plumbing, car maintenance) or purchased goods (e.g., lawn mowers, household appliances, and new automobiles) yielding an average annual expense of \$2,151 for these 21 subjects. Sixteen of the 21 subjects estimated the number of added angina episodes they avoided by hiring the service they purchase most often or the largest purchase of a good. The average expenditure for these services or goods was \$603 for these sixteen subjects. The mean expenditure per episode for these 16 subjects was \$38 and ranged from \$3.50 to \$140. This mean may be compared to the average willingness to pay of \$28 per angina episode given by the same 16 subjects. Note that willingness to pay measures the amount a person would pay to avoid additional episodes, given that expenditures for services or equipment have already been incurred.

Activity Patterns and CO Exposure

Data on activity patterns and CO exposure in urban locations were collected in an earlier UC Irvine research effort. An analysis of these data suggests that ischemic heart disease patients frequently encounter CO in the course of their daily activities, and may develop carboxyhemoglobin levels greater than 2.5 percent, a point where aggravation of angina has been observed in clinical studies.

CHAPTER 2. MEASURING AND VALUING HEALTH EFFECTS OF CARBON MONOXIDE

The first two sections of this chapter give a brief review of the health and economics literature relevant to measuring and valuing health effects of CO for IHD patients. The third section presents the theoretical framework for the instrument design and data analysis conducted in this study.

2.1 Biological and Health Effects of CO

People with IHD are considered to be particularly sensitive to the toxic action of CO because of their impaired coronary blood flow (Ayres, et al., 1970). Narrowing of the coronary arteries by atherosclerotic plaque limits blood flow, and hence oxygen delivery to the heart muscle (myocardium). When increases in the demand for both coronary blood flow and oxygen delivery exceed the available supply, myocardial ischemia ensues. Ischemia, or low oxygen stress, is manifest in several physiologic endpoints, including decreased force of contraction and changes in electrophysiology of the myocardium, and chest pain.

Chest pain, and the complex of symptoms associated with ischemic cardiac pain, are medically termed angina pectoris, or more simply angina. Chest discomfort or tightness may be accompanied by pain in the throat or lower jaw, or pain radiating across the chest to the arms. The frequency and severity of angina episodes are related to the extent of coronary disease and the work load placed upon the heart muscle. The most common form of cardiac pain is that provoked by exertion.

Myocardial ischemia is quantitatively related to changes in heart rate and blood pressure, and angina sufferers often learn to identify the level of

physical activity that will precipitate the pain. Angina may be brought on by walking uphill or upstairs, hurried walking on level ground, or lifting heavy objects. Pain may also be precipitated by emotional stress; excitement, anger, or tension may increase autonomic nervous system activity and increase heart rate and blood pressure. Exposure to cold temperature may cause constriction of peripheral blood vessels, thereby increasing blood pressure, and in turn raising the cardiac work load. Angina pain comes on quickly, and it is steady and constant, usually lasting for several minutes. Longer periods of ischemic pain are associated with more serious outcomes of myocardial infarction (heart attack). Under most circumstances, angina is relieved by rest, however nitrate medications may also be taken to increase coronary blood flow and dilate peripheral blood vessels, thereby decreasing the resistance against which the heart muscle pumps.

Exposure to carbon monoxide can decrease the exercise tolerance of IHD subjects who suffer angina. Inhaled CO displaces the oxygen in blood hemoglobin and alters the binding characteristics of oxyhemoglobin, further decreasing oxygen supply to the myocardium (Roughton and Darling, 1944). In standardized exercise tests, Andersen et al. (1973) observed statistically significant decreases in exercise duration to the onset of angina after four hours exposure to 50 or 100 ppm CO. The carboxyhemoglobin (COHb) concentrations resulting from these relatively low-level exposures were 2.9 and 4.5 percent, respectively. These COHb concentrations may be attained by nonsmoking residents of metropolitan areas (Wallace et al., 1987; Akland et al., 1985; Radford and Drizd, 1982), and therefore represent an important public health concern. Currently, the Health Effects Institute and the California Air Resources Board are funding research to replicate and extend the Andersen et al. (1973) study. Other clinical studies by Aronow (1981) and

Aronow and Isbell (1973) have suggested aggravation of angina at COHb levels near 3 percent. However, the methodology employed in these studies has not withstood rigorous scientific review (U.S. EPA, 1984 a and b).

Although provocation of angina is the endpoint of interest in our study, decrements in cardiac function have been measured in other clinical studies, which support the hypothesis of increased health risk from CO exposure. Significant decreases in left ventricular ejection fraction, indicating a decrease in the forcefulness of contraction of the myocardium, were observed in IHD patients whose COHb levels were elevated to 5.9 percent. In healthy, nonsmoking individuals, free of cardiac disease, COHb levels greater than 5 percent exceed the compensatory response of the cardiovascular system to hypoxic challenge; oxygen demands exceed the supply provided by increased coronary blood flow (Ayres and Grace, 1970), and exercise performance is generally impaired (Ekblom and Hout, 1972; Horvath et al., 1975; Weiser et al., 1978; Klein et al., 1980). The consistent demonstration of decreased aerobic work capacity in healthy individuals at the 5 percent COHb level lends indirect support to the Andersen et al. (1973) observations of angina aggravation in IHD subjects at 3 percent COHb. At the present time, CO exposure has not been unequivocally associated with changes in the electrophysiology of the heart muscle. Human and animal studies are limited in number and provide inconsistent data on disturbances in conduction velocity and heart rhythm (DeBias et al., 1973; Davies and Smith, 1980; Foster, 1981).

Epidemiologic evidence on the relationship between CO exposure and increased incidence of myocardial ischemia also is limited. In Los Angeles, total deaths and deaths from atherosclerotic heart disease (myocardial infarction) were significantly associated with daily mean outdoor CO concentration (Cohen et al., 1969; Hexter and Goldsmith, 1971). Kurt et al.

(1978, 1979) considered the specific relationship between community CO levels and the incidence of angina in Denver, Colorado. The incidence of cardiorespiratory complaints, including angina, were significantly associated with 24-hour mean CO levels exceeding 5 ppm. These epidemiologic studies have assumed that outdoor levels of CO are generally representative of personal exposures. The validity of conclusions based on this assumption is questioned by later research demonstrating that time-weighted personal exposures are not strongly correlated with CO measurements at nearby outdoor fixed-site locations (Akland et al., 1985; Hartwell et al., 1984; Johnson, 1984).

Previous Assessments of Community CO Exposure

The most comprehensive population-based study of community CO exposures was performed in the winter of 1982-83 by the U.S. EPA in the cities of Denver, Colorado, and Washington, D.C. (Akland et al., 1985). In each metropolitan area, five-hundred nonsmoking residents, age 18-70, were randomly selected to carry a personal exposure monitor for one or two 24-hour periods. Each subject kept a written diary of activities and locations during their monitoring day, and samples of end-expired breath were collected at the end of the monitoring period for analysis of CO content and estimation of COHb level. Microenvironments associated with automobile activity displayed the highest mean personal exposures to CO (7-14 ppm) and included exposure indoors in public garage, service station, or auto repair facility, and in transit in a motor vehicle (Hartwell et al., 1984; Johnson et al., 1984). Moderate exposures (2-5 ppm) were measured in indoor public places such as restaurants, stores, and health care facilities. Schools, residences, and outdoor recreational areas generally demonstrated lower mean exposures (0.5-2 ppm).

In Denver, 3 percent of the daily maximum personal exposures exceeded the 35 ppm 1-hour average federal standard, and 11 percent exceeded the daily maximum 9 ppm 8-hour average federal standard. In Washington, while no subject's personal exposure exceeded the 1-hour standard, 3.5 percent of personal exposures exceeded the 9 ppm standard (Akland et al., 1985; Ott et al., 1987).

Fixed monitoring sites in Denver and Washington tended to overestimate mean exposures for the population, predicting that the daily 9 ppm 8-hour standard in Denver and Washington would be exceeded 25 and 7 percent of the time, respectively. When personal exposure monitoring data and breath estimates of blood COHb were entered into the Coburn equation to estimate recent CO exposures, 10 percent of the nonsmoking population of Washington, D.C. was estimated to have exceeded the 9 ppm 8-hour ambient standard (Wallace et al., 1987). The authors based this upward revision primarily on the negative measurement bias observed in the electronic instrumentation used to measure personal CO exposure. The Denver and Washington studies do identify portions of the population at risk to CO exposure by characteristics of working outside the home, commuting time greater than 6 hours per week, high exposure source at work, and unvented gas stove present at the residence (Akland et al., 1985).

As part of the 1976-1980 National Health and Nutrition Examination Survey (NHANES II), over 8,000 blood samples were analyzed for COHb content and classified according to demographic and personal characteristics (Radford and Drizd, 1982). Wintertime mean COHb concentrations in never-smokers living in urban areas, aged 12-74 years, was 1.25 percent. Over 4 percent of nonsmoking adults displayed COHb levels greater than 2.5 percent; however, the exact source of elevated exposure could not be identified. The subgroup comprised of children aged 3-11, if used as a proxy for urban residents free of

confounding exposures from occupational and personal tobacco use, had mean COHb levels of 1.01 percent during winter months when COHb levels were substantially higher. In the winter, 3.3 percent of the children had COHb levels in excess of 2.5 percent. These results, when extrapolated to the nonsmoking adult population, indicate that 3-4 percent of the population may be exposed during the winter to CO levels exceeding the 9 ppm 8-hour and 35 ppm 1-hour standards chosen to keep COHb levels from rising above 1.5 percent.

In summary, population-based sampling of CO exposure and COHb levels indicates that a portion of the population living in metropolitan areas is exposed to higher CO levels because of personal activities. The results of the Denver and Washington surveys suggest that these higher exposures are more strongly associated with mobile sources, gas stove use, and passive smoking, than with occupational settings characterized by high exposure. While the sensitive population of interest, IHD subjects, may not necessarily be found in high-exposure occupations, their normal urban activities may place them in situations which include exposure to the emissions of gas stoves, furnaces and space heaters, and gasoline-powered appliances, and also to environmental tobacco smoke. The Program in Social Ecology at UC Irvine conducted a field study during January to May 1985 to characterize the activity patterns and CO exposures of men diagnosed with severe IHD.

Community Exposure to CO Experienced by IHD Subjects

In the UC Irvine study, a sample of individuals was selected from medical records at UC Irvine Medical Center and Long Beach VA Medical Center. As identified from coronary angiogram data, each individual invited to participate in the study had at least 50 percent occlusion of one of the three

major coronary arteries. A further criterion for selection was "objective" electrocardiographic evidence of ischemia during exercise stress testing. Since angina is a "subjective" indicator of ischemia, and may or may not occur reproducibly during exercise tests, the presence of angina during clinical stress testing was not a prerequisite for participation in the research program.

Subjects with IHD were continuously monitored as they went about their normal day-to-day activities. The subjects wore a personal CO monitor recording minute average exposures in an electronic memory and, at times, a Holter ambulatory ECG monitor. Only the results of the exposure monitoring were used and presented in the current study of economic risks, and therefore electrocardiographic measurements will not be presented. Subjects maintained a diary of activities, locations, and symptoms during 24-hour sampling periods. The subjects also provided end-expired breath samples into collection bags during the monitoring days to assess COHb levels which, when analyzed, were compared with levels predicted from CO exposure profiles.

While wearing the CO monitors, subjects were asked to maintain a diary of their daily activities. The time-activity diaries were designed to provide detailed information on the subject's surroundings and proximity to potential pollution sources. Diaries for this study also requested detailed information on the physical state of the individual: activity level, health symptoms, and medication taken. These data were used to estimate myocardial oxygenation demands, identify periods of perceived ischemia as manifested in angina pectoris or palpitation, and corrective actions. Subjects completed questionnaires on potential exposures to CO in the workplace and residence as well as background on health and lifestyle. Subjects were asked to wear CO personal exposure monitors (PEM) for five 24-hour periods: four weekdays and,

if possible, 1 weekend day. While wearing the monitor, subjects were asked to provide end-expired breath samples at six specified intervals. These samples were used to estimate COHb.

This monitoring served several purposes, including characterization of the time-activity schedules of IHD subjects for comparison against data for the normal population, characterization of the CO exposure pattern encountered in normal urban activities, and estimation of the resulting COHb experienced by an IHD subgroup. Forty-three (43) subjects participated in CO monitoring, contributing 159 person-days of personal exposure data. Thirty of these subjects participated in the present study on economic impacts of angina. Twenty additional subjects were specifically enlisted to participate in the economic impact research.

The results of this field study are presented in Section 4.4. The CO exposure information from the personal exposure monitors characterized the types of exposure-activity environments encountered by IHD patients. This information is useful in evaluating the risk of IHD patients developing particular levels of COHb in their urban movements. The 1440 individual one-minute CO averages, making up the 24-hour monitoring period, were entered into uptake-elimination model algorithms to predict the individual's COHb response to exposure. Exposure profiles from individuals who had participated in the original 1985 field survey were used as input in the analysis of non-medical defensive behaviors, presented in Section 4.3.

2.2 Background on Economic Health Valuation

There are two different ways commonly used to approach the economic valuation of changes in health. One is cost of illness (COI), which is

historically more common. The COI approach is described by Rice (1966) and Hartunian et al. (1981), and involves estimating the medical expenditures and productivity losses associated with the health condition of interest. It has long been recognized that COI measures do not reflect the full welfare impact of a health problem because the financial impact of an illness is only part of the story. Health problems also typically involve discomfort, inconvenience, and activity restrictions that go beyond what is reflected in direct expenditures and lost income.

The second approach to the economic valuation of changes in health is willingness to pay (WTP). The WTP measure is defined as the change in income that would cause the same change in utility (well-being) for the individual as that caused by the health condition of interest. WTP measures are more appropriate than COI measures for comparison to the costs of public policies to protect human health, such as pollution control regulations, because they are a dollar measure of the full impact of the potential change in health. In general, WTP measures are expected to exceed COI measures for the same change in health, although there may be some exceptions. It is also important to note that there may be a difference in who incurs the impact of cost. For example, an individual who gets paid sick leave may not consider his lost productivity as a cost to himself, but it is a cost to society.

WTP measures, although theoretically more desirable for benefit-cost analysis, are more difficult to obtain than COI estimates. There are basically two types of approach for estimating WTP for changes in health. The first is called the "averting behavior" method, and involves inferring WTP from real-life situations where individuals are choosing a tradeoff between some benefit or cost that has a dollar value and some perceived or derived change in health. The second method, termed "contingent valuation," involves

asking subjects to respond to a hypothetical situation in which such a tradeoff is required.

For this study, a survey instrument was designed to obtain both COI and WTP information for evaluating changes in angina symptoms. WTP estimation involved both direct WTP questions and actual trade-off situations presented to subjects. The emphasis of the study is on the WTP estimates, but the COI information serves as an important standard for comparison.

2.2.1 Previous Studies Estimating WTP for Changes in Health

To date, few studies have been conducted estimating WTP for changes in non-fatal health effects that may be associated with air pollution exposure. Methods for estimating WTP for changes in morbidity are in developmental stages and our study contributes to this method development effort. Four studies have been conducted that have important similarities to our research effort: Loehman et al. (1979), Rowe and Chestnut (1985, 1986), Tolley et al. (1985), and Dickie et al. (1986, 1987). This discussion is not intended as a detailed review of these studies, but as an explanation of how this study builds upon previous research efforts.

Loehman et al. (1979) conducted a mail survey concerning common respiratory symptoms such as coughing and sneezing, shortness of breath, and head congestion. The sample was drawn from the general population in the Tampa, Florida area. The questionnaire was quite brief, explaining simply that policymakers could use information about how the public values the avoidance of specific health problems. Respondents were asked to select among a list of possible dollar values for avoiding one or seven days of minor or severe symptoms, for each of three types of symptoms. It was observed that

subjects offered higher dollar amounts for preventing the severe symptoms. This would be expected and suggests some logical consistency. The results also indicated that values per symptom day avoided were lower when respondents were asked about seven days than when they were asked about one day. This finding is consistent with economic theory concerning diminishing marginal utility of additional amounts of a good, although health is not a typical economic good, such as apples and automobiles, and might not necessarily show all the same properties.

The research of Loehman et al. (1979) has important implications for policy analysis. Evaluation of policy actions that will result in changes in the amount of illness is more complicated than simply applying a fixed value per unit of illness to the amount of illness expected to be avoided. The value per unit of illness is expected to be a function of the amount of illness reduced or avoided, i.e., values estimated for a one-day-per-year reduction in head congestion per person should not be simply multiplied by 20 to evaluate a program that will prevent 20 days per year of head congestion per person.

Another finding in the Loehman et al. (1979) results is that mean values were significantly larger than median values for each symptom. This indicates a skewed distribution, and the authors of this study suggest that the median values were actually more representative of the central tendency of the responses than the mean values. The mean values were influenced by a few responses that were very large compared to most of the responses. One question that has subsequently been raised is whether some of these large bids may be protest responses by individuals who object to putting dollar values on health. This is being explored further in subsequent research, including the study reported here.

Tolley et al. (1985) conducted personal interviews in a general population sample to assess WTP to prevent seven common symptoms, including cough, head congestion, headache, and nausea. Another set of questions also elicited dollar values for preventing angina symptoms. Each symptom was described, and the respondents were asked to estimate the most they would be willing to pay to prevent having the symptom on a given number of days in a year. Mean values were generally of the same order of magnitude as the mean values obtained by Loehman et al. (1979). The WTP estimates per day of symptoms avoided were significantly lower when the question was for 30 days rather than one day, a result also consistent with the Loehman study. The findings of Tolley et al. (1985) indicated that values for preventing symptoms were higher for respondents who more often experience those symptoms, and for respondents who reported being in poor general health. The results from questions addressing angina symptoms are inconclusive because respondents were asked to consider angina symptoms whether or not they had the kind of heart condition that is associated with angina. This type of approach is problematic for two reasons: 1) people who have never had angina probably have a more difficult time estimating a value for preventing angina symptoms than symptoms they have experienced, and 2) the CO policy issue is not whether people without IHD will develop IHD and experience angina, but whether people with IHD will experience angina more frequently than they would otherwise. It may be appropriate to ask healthy subjects about values for preventing risks of developing chronic illnesses if such a risk is at issue for a particular air pollutant, but actual development is not the primary concern with regard to CO and angina.

Dickie et al. (1986, 1987) have pioneered an application of the averting behavior method for estimating WTP for reduction of symptoms potentially

related to ozone exposure, such as coughing, throat irritation, sinus pain, and headache. The averting behavior method considers behaviors the individual may undertake to reduce symptoms and infers a value for the reduction in symptoms from the cost of the averting behavior. The averting activities considered in this study were automobile air conditioning, home air conditioning, home air purification, and switching from gas to electric cooking.

By analysis of a model of utility-maximizing behavior with respect to health, Dickie et al. (1986, 1987) derived the following expression for marginal WTP for symptom reduction.

$$WTP = Q_i/S_i \quad (2-1)$$

where: Q_i = full price (including time) of the i th averting activity
 S_i = marginal product of the i th averting activity in reducing the symptom.

The common sense interpretation of this expression is that the individual will put resources into the averting activity to the point where the value of the marginal benefit (the utility gained by reducing the symptom) just equals the marginal cost of obtaining the symptom reduction. The averting activity can therefore be interpreted as a market activity in which the individual can be observed "purchasing" a symptom reduction, and the "price" paid can be interpreted as an estimate of the WTP for the symptom reduction.

Dickie et al. (1986, 1987) estimated Equation (2-1) for several different symptoms by first estimating separate symptom production functions that show the relationship between the probability of experiencing the symptom and

whether the averting activity was undertaken. Equation 2-1 was then evaluated for a single day of each of the symptoms avoided. The estimated values tended to be lower than the Loehman et al. (1979) and Tolley et al. (1985) mean WTP responses for similar symptoms on a single day, but were closer to the per-day values obtained when respondents were asked about avoiding 7, 30, or 90 days of each symptom in a year. For comparison, Dickie et al. (1986, 1987) also asked direct WTP questions concerning avoiding one day of each symptom. The mean responses were similar to those obtained by earlier studies.

The application of the averting behavior method is an important innovation for using actual behavior to infer WTP values for changes in symptoms, but significant limitations remain. For example, most of the behaviors involve benefits beyond the reduction of symptoms, and may in fact be primarily motivated by some other purpose, such as obtaining a more comfortable living environment.

An averting behavior approach is also used in the analysis of angina symptoms presented in this report. An expression like Equation 2-1 is evaluated using data obtained from the respondents. This is discussed more fully in subsequent sections of this report (e.g., in Section 4.3).

Rowe and Chestnut (1985, 1986) conducted a study with a panel of asthmatics to obtain information on the benefits of reducing or preventing asthma symptoms. Information was obtained from about 90 asthmatics living in Glendora, California, concerning behavior adjustments they made to avoid or reduce asthma symptoms and the medical costs related to the asthma, and what they would be willing to pay to have their symptoms reduced. Information was obtained on the effect of the asthma symptoms on their lives, and included financial and nonfinancial impacts. The study also involved an analysis of averting behaviors undertaken on days when subjects were concerned that their asthma symptoms might occur.

The study augmented the conventional contingent valuation approach by obtaining information on the subjects' beliefs concerning the primary benefits of reduction in asthma symptoms. On average, the subjects ranked reductions in discomfort and activity restrictions as more important than reductions in medical expenses and income loss (the primary components of a COI measure). This supports the hypothesis that COI measures underestimate the total value of reducing or avoiding asthma symptoms. Additional information obtained about each subject also allowed consistency checks to evaluate the credibility and validity of the responses to the direct WTP questions. Since a few very high responses can unduly influence mean values, and contingent valuation questions are hypothetical and do not require that an actual payment be made, personal characteristic information is essential for valid interpretation of results of contingent valuation questions. Hopefully, future WTP efforts will be better structured to understand and evaluate the validity of the responses given to these contingent valuation questions.

2.3 Theoretical Framework for the Study Design

An economic model of individual behavior and utility maximization with respect to health is based on a theory of consumer behavior developed by Becker (1971). The model was first used by Grossman (1972) and later applied to the health effects of environmental pollution. The basic concept is that the individual combines purchased goods and services with his own time and skills to produce desired outputs that contribute to his utility (or well-being). What this means for health is that the individual uses medical care and health-enhancing activities, such as exercise and sleep, to maintain his health at an optimal level, given his preferences, time and dollar budget

constraints, biological endowment, and effectiveness at producing health. Thus, given certain constraints, the individual chooses his level of health. The relationship between the individual's health and health-enhancing expenditures and activities is referred to as the health production function. Technology, biological endowment, and pollution levels will influence this relationship. The model provides an analytical tool for examining the effect of changes in health on the individual's utility and for identifying factors that will be helpful in evaluating changes in health.

The basic health production function model of consumer behavior presented below is a synthesis of the models presented by Gerking et al. (1983, 1986) and Harrington and Portney (1987), developed specifically to analyze WTP for changes in pollution that may affect health. This model is useful because it can be used to define specific components of an individual's WTP for changes in his own health by analyzing the ways that health can be expected to affect an individual's utility. The results of the analysis suggest ways to approach the estimation of WTP and give criteria by which to evaluate the completeness of WTP estimates.

The individual's utility is a function of the goods and services consumed and his or her state of health, which directly influences the enjoyment of life's activities and how good the individual feels. The direct effects of the individual's state of health on utility would include pain and discomfort experienced during an illness.

$$U = u(X, H) \quad (2-2)$$

Where:

U = the individual's utility in a given time period

X = goods, services, and leisure activities the individual consumes that are unrelated to his or her health

H = the individual's state of health

The individual's state of health (H) is a function of defensive expenditures and health-enhancing activities undertaken. These include preventive medical care, exercise, and diet; exogenously determined levels of pollution; and biological, social and economic characteristics of the individual (e.g., congenital conditions, age, and education) that influence the effectiveness with which he can maintain a given state of health.

Two simplifying assumptions are used in this presentation of the model: pollution levels are exogenous, and defensive expenditures and activities affect utility only through their effect on health. The model could treat pollution exposure as an endogenously determined variable influenced by the actions of the individual, but that is not the focus of this analysis. Relaxing the second assumption would result in a more complex model, but in reality many defensive activities may produce utility in more than one manner; for example, playing tennis produces enjoyment of the game jointly with the health benefit of the exercise. This problem is addressed in the study design and analysis but is not included in this presentation of the model.

The level of defensive expenditures and activities is chosen by the individual as a function of the individual's health, environmental pollution,

and other factors. The health production function and the defensive expenditures function are therefore simultaneous equations.

$$H = h(D, P, Z_1) \quad (2-3)$$

$$D = d(H, P, Z_2) \quad (2-4)$$

Where:

- D = defensive expenditures and activities
- P = pollution
- Z₁ = biological, social and economic characteristics of the individual
- Z₂ = biological, social and economic characteristics of the individual that influence defensive expenditures and activities

Duration of illness and medical expenditures made in response to illness enter into the individual's budget constraint because they affect the amount of time and money the individual has for other things, but they do not directly enter the individual's utility function. These medical expenditures do not prevent additional illness but may mitigate the discomfort and loss of activity that accompany illness.

$$T_s = t(H) \quad (2-5)$$

$$M = m(T_s) \quad (2-6)$$

Where:

T_s = time spent sick

M = medical expenditures in response to illness

The individual faces the following time and budget constraints.

$$X*P_x + D*P_d + M*P_m = w*T_w + I \quad (2-7)$$

$$X*T_x + D*T_d + M*T_m + T_s + T_w = T \quad (2-8)$$

Where:

P_i = price per unit of i , for $i = x, d$, and m

T_i = time per unit of i , for $i = x, d$, and m

T_w = time spent working

w = the individual's wage rate

I = nonwage income

T = total time available

Equations 2-7 and 2-8 can be combined into a "full income" constraint by assuming all time is valued at the wage rate, and defining a combined dollar and time cost: $Q_i = P_i + w*T_i$. Using w as the value for all time assumes that

individuals choose to work to the point where the marginal benefits of working (the wage earned) just equal the marginal costs in terms of the value of time lost from other activities. In this simple model, it is also assumed that all costs of defensive and medical care are borne by the individual and that prices in the medical care market reflect marginal social costs of producing medical care.

$$X*Q_x + D*Q_d + M*Q_m + w*Ts = w*T + I \quad (2-9)$$

The individual can be expected to choose levels of X and D that maximize utility (Equation 2-2) subject to the constraints of Equations 2-3 to 2-9. The choice is made by allocating time and dollar expenditures such that the marginal benefits equal the marginal costs of each good and service for the individual. For defensive expenditures, for example, the marginal benefit is the dollar value of the improvement in utility obtained by an additional unit of defensive effort, plus the medical expenditures that no longer have to be incurred, and the opportunity costs of time not spent in sickness as a result of the unit increase in defensive efforts.¹ The marginal cost is the unit cost of defensive efforts, including both money and time (Q_d). This means that the amount of defensive efforts undertaken will depend on the effectiveness of these efforts in maintaining health and on the costs and discomfort associated with time spent sick, as well as on the direct costs of the defensive efforts.

Dickie et al. (1986, 1987) have used this model to derive the following expression for the dollar amount that would keep utility constant if a change

¹The first order condition for defensive efforts (D) is $\alpha_L/\alpha_D = U_H*H_D - a(Q_d + M_{TS}*TS*H_D) = 0$, where subscripts denote partial derivatives.

occurs in H. This is the marginal WTP to prevent or obtain a potential change in H. An expression for willingness to accept (WTA) compensation would be the same, only the reference level of utility would be different. WTA for a decrease in health is the increase in dollar income that would offset the decrease in utility associated with the decrease in health. For an increase in health, the WTA would be the decrease in dollar income that would offset the increase in utility associated with the increased health.

$$WTP_H = H_D * Q_d \quad (2-10)$$

Where:

WTP_H = marginal WTP for changes in H

H_D = the partial derivative of H with respect to D

Equation (2-10) is equivalent to Equation (2-1) and suggests that when an inexpensive defensive action is available to offset a potential decrease in H, then the WTP to prevent that decrease in H will be small, not exceeding the cost to the person of the defensive action. Similarly, WTP to obtain an improvement in H will not exceed the cost to the individual of the defensive action to obtain the improvement.

Another expression for marginal WTP for potential changes in H can be derived from Equation (2-10), using the first order condition for D.

$$WTP_H = w^*Ts_H + Qm^*M_H + Qd^*D_H + a^*U_H \quad (2-11)$$

where the subscripts denote partial derivatives.

The first term is the opportunity cost of the change in time spent sick associated with a change in H, the second term is the change in medical expenditures associated with the change in H, the third term is the change in defensive expenditures associated with the change in H, and the fourth term is the dollar equivalent of the direct change in utility (i.e., the pain and discomfort) associated with the change in H. The dollar equivalent of a unit change in U (i.e., the marginal utility of a one-unit change in income) is represented by (a) in the fourth term.

The utility maximization conditions of the model suggest that when there is a change in pollution, the individual will adjust the allocation of his resources so as to minimize any adverse effect on utility, or maximize any advantageous effect. For example, if pollution increases, the individual may choose to completely offset the effects on his health by increasing defensive expenditures only if the resulting reduction in income available for other goods (X) reduces utility less than the decrease in utility that would have occurred from the decrease in H. The individual will, of course, be constrained by his ability to affect health with defensive expenditures. An expression for marginal WTP for a change in pollution (P), similar to Equation (2-11), can be derived from the model. This expression can be written as follows where, for example, dM/dP is the total change in medical expenditures as a result of the change in P after the individual has adjusted to maximize utility.

$$WTP_P = w*(dts/dP) + Q_m*(dM/dP) + Q_d*(dD/dP) + a*(-dU/dP) \quad (2-12)$$

Harrington and Portney (1987) use this derived expression for WTP for changes in pollution to argue that under certain reasonable assumptions, cost of illness estimates for changes in pollution that include income lost and medical expenditures can be expected to be a lower bound on WTP. Income lost due to time spent sick will be less than or equal to the first term, which is all time spent sick multiplied by the wage rate. Medical expenditures are equivalent to the second term. Cost of illness will be less than WTP as long as the third and fourth terms are non-negative for an increase in pollution. This requires the assumption that the relationships in the model are such that when pollution increases, the new equilibrium level of health is the same or lower and that defensive efforts stay the same or increase. This assumption may not be correct in every instance. The analysis by Courant and Porter (1981) suggests that it is at least conceivable that the health production function and utility maximization conditions of the model are such that when pollution increases, health increases.

CHAPTER 3. METHODS

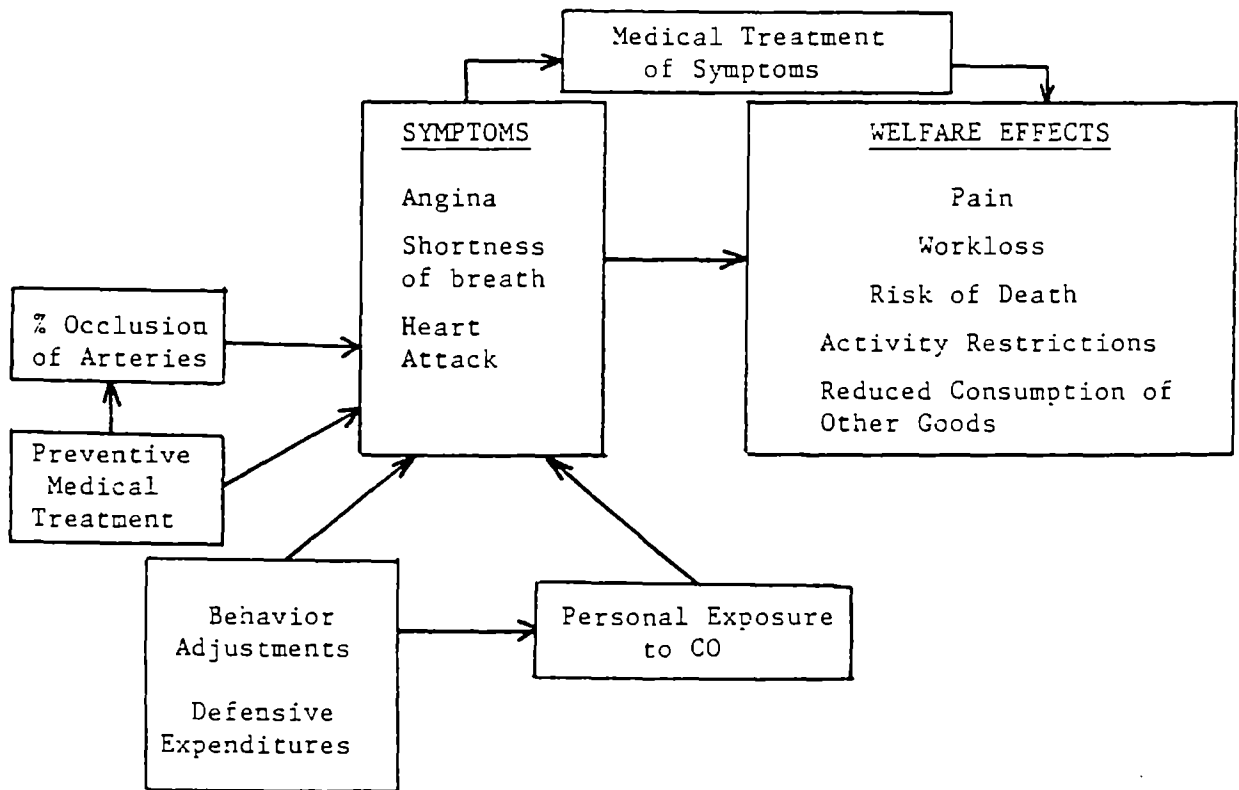
3.1 Questionnaire Development

The primary purpose of the study was to develop the means to estimate the value of changes in angina symptoms. Part of this work involved developing and testing a survey instrument for collecting information from IHD patients that would be useful in evaluating the effects of CO on angina symptoms. The study focused on the evaluation of changes in angina symptoms, whatever the underlying cause, and the effect of CO exposure was separately factored into the health production function (Equation 2-3). Figure 3.1-1 shows an expansion of the health/behavior model presented in the previous section as it is applied to the IHD patient with angina. This model guided the choice of measures and items in the survey instrument. Subject and interviewer versions of the questionnaire are included in Appendix 2.

The survey instrument combined several different approaches to examine the welfare implications of changes in angina symptoms for IHD patients. These included cost of illness, defensive activities, and contingent valuation estimates of WTP. The model presented in the previous section suggests that a comprehensive approach for evaluating the effects of CO on angina symptoms would involve the specification and estimation of Equations 2-3 and 2-4. However, estimating this system of equations is difficult due to the complexities of the relationships involved. A larger sample size than that obtained for this test of the developed instrument is needed for a more satisfactory evaluation of this approach.

Throughout the questionnaire we have attempted to keep questions about angina symptoms in the context of the overall effects of having IHD on the

Figure 3.1-1. Linkage between expenditures and health for IHD patients



patients' lives. It was uncertain at the outset whether the subjects would be able to isolate angina symptoms from other concerns, especially concern about potential heart attacks. Such a perceived (whether real or not) association may be very significant in determining how a subject reacts to questions about angina and may mean that isolated consideration of angina symptoms is inappropriate.

3.1.1 Cost of Illness

To develop an estimate of annual medical costs, the survey instrument collected detailed information on medical treatment associated with IHD obtained in the past year. Because most of our subjects were VA patients, or had some other medical insurance, little information could be obtained about actual costs. A different sample of patients might produce a different result.

Even though the extensive insurance coverage for this sample meant that few of the medical costs were borne by the individual, medical cost estimates are still useful. Medical costs that are not borne by the individual would not be expected to be reflected in the estimates of WTP derived from the individual's behavior or from direct WTP questions. Medical costs are, however, a cost to society and should be considered in a comprehensive analysis of the effects of a policy that would result in changes in IHD symptoms. Medical care information is also important for the health production function estimation, and in many cases should be considered a defensive effort.

The costs of medical treatment were estimated using each individual's self report of treatment. Treatment scenarios were assembled under the

guidance of a staff cardiologist from the UC Irvine Medical Center. The costs of a typical emergency room visit, hospitalization for complaint of chest pain or myocardial infarction, or surgical procedures were estimated using accounting records furnished by UC Irvine Medical Center. Data on the costs of each procedure could not be obtained for the VA Medical Center. Therefore, without access to accounting records for each subject, the costs of medical treatment derived in this study represent the best estimate based upon reasonable scenarios and the fee-for-service data of one regional medical center.

The survey also included questions on work loss due to angina and other IHD symptoms. Patients currently working were asked about work loss days and paid sick leave. Subjects younger than retirement age who were not working were asked if they had ceased work because of IHD and what they had earned previously. This allowed quantification of income lost due to IHD.

3.1.2 Defensive Activities and Expenditures

The subjects were next asked a series of questions regarding expenditures undertaken to avoid or reduce angina symptoms. These questions were intended to allow evaluation of Equation 2-10. Additionally, they extended medical care information to nonmedical activities that may be important in the overall status of the individual's health. Finally, these questions help those respondents with expenditures focus upon their own revealed willingness to pay to reduce angina prior to the direct willingness to pay questions.

One series of questions probed whether the individual hired help for chores he would otherwise do on his own, such as lawn mowing and house cleaning. Subjects were asked to identify the type of help hired, if any, and

whether the hiring was primarily motivated by their heart condition. This inquiry served to identify joint benefits. Expenditures were included in this part of the analysis only if the subject said that he would prefer to do the work himself if his health permitted. The subject was then asked to estimate the number of angina episodes he believed he avoided by making the expenditure. He was asked whether other health concerns, such as heart attack risks, might also motivate the expenditure. This provided an estimate of H_D from Equation 2-10, based on the perceptions of the subject.

In addition, subjects were asked to list all expenditures undertaken to avoid angina, to develop a total defensive expenditure estimate for each subject. Some descriptive information about changes made in activities due to the heart problem was also obtained.

3.1.3 Direct WTP Questions

Estimation of WTP was approached by directly asking questions about the amounts subjects would be willing to pay to avoid an increase in angina symptoms. Prior to these questions, subjects were asked to describe recent typical, severe, and mild angina episodes. They were also asked to rate the significance of various aspects of the problems associated with angina, including pain, medical costs, lost income, and worry about heart attacks. These questions gave better characterization of the impact of angina symptoms on the patient, and prompted the subject to think about how the symptoms affected him.

Two types of WTP questions were asked. Close-ended questions asked whether subjects would pay certain given dollar amounts to prevent a specific increase in angina, these were followed by open-ended questions in which

subjects were asked to give a dollar estimate of the maximum amount they would be willing to pay to prevent the hypothesized increase in angina. The decision to use both types of WTP questions was made following the preliminary interviews, in which subjects found the open-ended WTP questions alone difficult to answer. It was easier to give a dollar amount after being asked to consider a few specific amounts suggested by the interviewer. It is possible that the amounts suggested in the close-ended questions were leading the responses to the open-ended question. This problem is addressed in the analysis, in Section 3.4 of this chapter.

To discuss whether the WTP amount per episode would change if different numbers of episodes were anticipated, approximately half the subjects were asked about an angina increase of four episodes per month, and the other half were asked about eight episodes per month. The numbers of episodes were selected as small enough to be potentially realistic with respect to the impacts of air pollution and large enough to be significant to the individual. Since some subjects no longer had active angina, and therefore had no interest in decreasing their symptoms, all subjects were asked about a potential increase rather than decrease in angina symptoms. It was also considered more realistic for most IHD patients to consider an increase rather than decrease in symptoms as they had already made all the health improvement they could through surgery, treatments, and lifestyle changes. This question is also policy relevant because IHD tends to be a progressive disease with symptoms increasing over time. Reductions in air pollution might prevent angina symptoms from increasing as much as they would otherwise have for some patients. The hypothesized payment vehicle was a medication that would prevent an increase in angina, but that would not be covered by insurance.

Follow-up questions were used to probe refusals, zeros, and responses of very large WTP amounts. Interviewers also recorded comments offered by the subjects while responding to these questions.

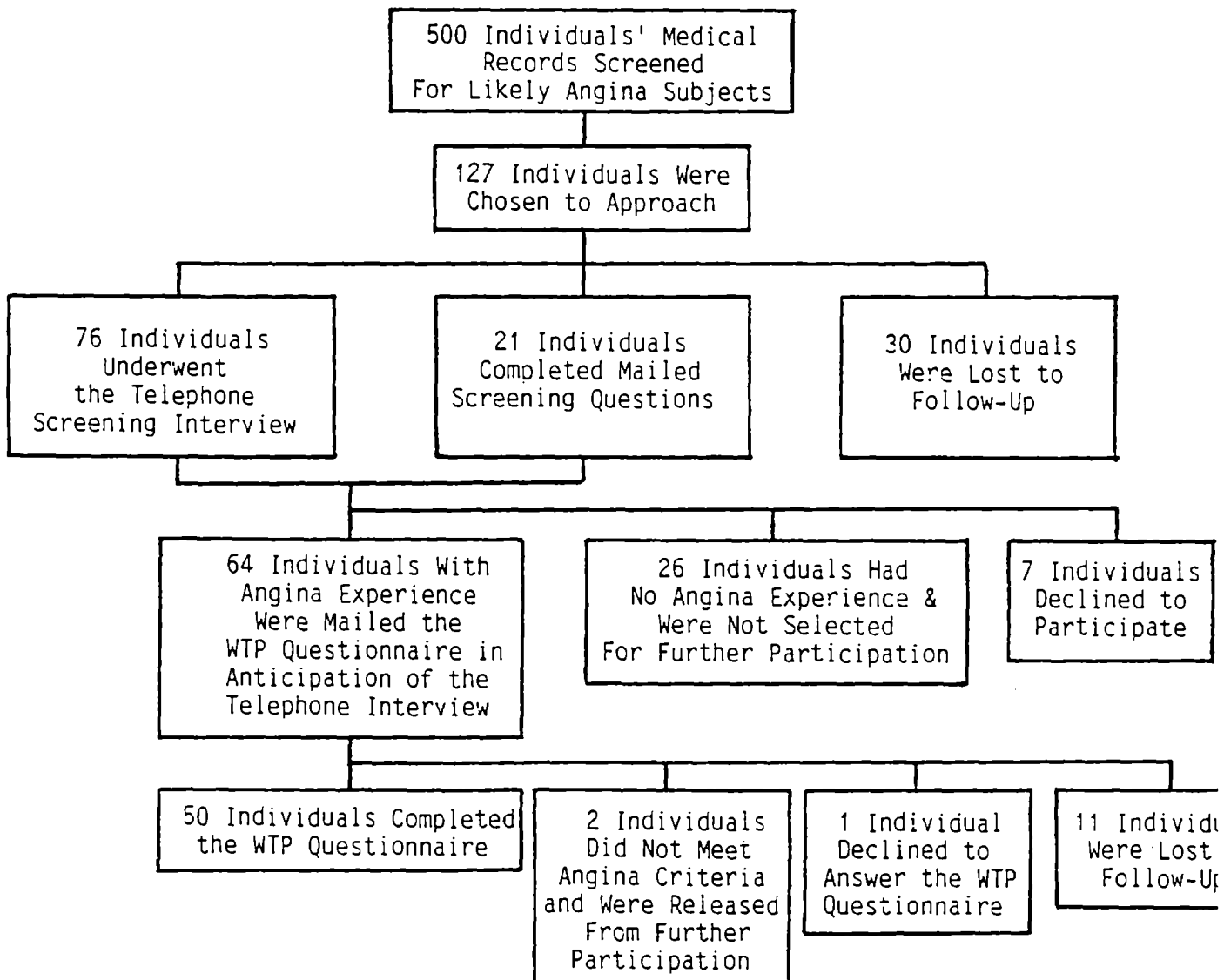
3.1.4 Health Production Function

Given the small sample size of this study, we did not attempt to estimate a health production function; pertinent information was obtained, however, to contribute to such an estimation with a larger study sample. This information included medical history, attitudes toward health risks and angina, and information that would help assess potential exposure to CO.

3.2 Panel Selection

Medical records from the UC Irvine Medical Center and the Long Beach VA Medical Center were reviewed to identify potential participants (Figure 3.2-1). A subject pool of 500 men was identified for earlier community exposure monitoring and clinical studies on the health effects of CO (California Air Resources Board projects performed by UC Irvine). Of this group, 127 men with a history of chest pain and physician diagnosis of angina pectoris were targeted to confirm their angina experience and solicit participation in the study. Seventy-six men were successfully contacted by telephone and completed the initial screening interview (Appendix 1). A modified version of the Rose Questionnaire (Rose et al., 1977) was administered to each subject to identify individuals who had experienced angina symptoms within the previous 12 months. The Rose Questionnaire has demonstrated a sensitivity of 81 percent and a specificity of 97 percent in similar field applications (Heyden et al.,

Figure 3.2-1. Angina subject selection and disposition



1971). If a subject's answers to this screening interview identified him as having experienced the complex of symptoms associated with angina pectoris within the last year, he was asked if he would be willing to participate in a longer interview regarding his angina and how it affected his lifestyle. Targets who could not be reached by telephone were contacted by mail and asked to complete an abbreviated form of the initial telephone interview to confirm a history of angina. No compensation was offered for participation in the study.

Of the 127 individuals with angina experience, 64 were identified as having recent angina symptoms and were mailed the Subject Version Questionnaire to complete and have available as a visual guide during the telephone interview. Telephone interview contact was attempted seven to 10 days later. (See cover letter, Appendix 2). Of the 64 potential subjects, 50 completed the interview; 11 could not be contacted by telephone and were lost to follow-up; two did not qualify and were released from further participation; and one declined to answer the questions, judging them to be of a highly personal nature.

Characteristics of the Sample

The 50 men participating in the study represent a wide range of angina experience (Table 3.2-1). Forty-three subjects were currently experiencing angina with a mean frequency of one episode per week, with a discomfort level described as generally being mild to moderate. Information on the length of time that the subjects had experienced angina symptoms was not collected. However, all subjects' angina experience was at least two years, corresponding to the age of hospital medical records from which the subjects were

Table 3.2-1. Characteristics of research subjects used to evaluated the survey instrument

Characteristic	Mean Value	Frequency or Range
Current Angina		43/50
Former Angina		7/50
Experienced a Heart Attack		34/50
Angina Frequency	1/Week	< 1/mo to > 3/day
Angina Severity	Mild to moderate	No to very severe discomfort
Coronary Artery Bypass Surgery		23/50
VA Health Insurance		39/50
Private Health Insurance		15/50
MediCare		22/50
HMO Program		3/50
MediCal		7/50
Employed		15/50
Household Income	\$22,021	< \$4,999 to > \$60,000
Age	61.5	44-83
Married		39/50
Number in Household	2.4	1 to 5
Education	Completed High School	3rd grade to Postgraduate
Ancestral Origin		43/50 White 4/50 Latino 2/50 Black 1/50 Indian
Current Smoker		5/50
Former Smoker		37/50

selected. Seven subjects no longer experienced angina and largely attributed relief to bypass surgery. Thirty-four subjects had experienced at least one heart attack. The median time since last heart attack was two to three years. Twenty-three subjects had undergone coronary artery bypass graft surgery.

Thirty-nine of the 50 subjects were eligible to receive health services from the Veterans Administration. The majority of subjects supplemented their VA coverage with private insurance or MediCare. In general, subjects had complete coverage for physician office charges and emergency room and hospitalization expenses.

Fifteen subjects were currently employed. The household income of subjects ranged from less than \$4,999 to greater than \$60,000, with a mean of \$22,000.

The age of the subjects ranged from 44 to 83 years, with a mean of 61.5 years.

Thirty-nine of the subjects were not currently smoking tobacco and of this group, eight had never smoked.

Thirty-four of the 50 subjects had participated in an earlier research project conducted by UC Irvine measuring personal exposure to CO in the community, and 14 subjects had participated in clinical studies examining the effects of CO on the heart under exercise stress.

3.3 Sampling Procedures

All subjects lived in the greater Los Angeles area. Interviews were conducted between February 20 and July 1, 1986. The four earliest interviews, conducted in February, served as pilot interviews. Based upon

responses, the questionnaire was edited. The survey of the main sample began in April with the majority of the interviews being conducted in May and June. Typically, several calls were required to schedule a convenient time to conduct the 45-minute interview. Subjects often requested additional time to review the questions prior to the interview.

Three interviewers were used in the study; each read dialogue and questions from the Interviewer Version Questionnaire. Telephone headsets were used to free the interviewer's hands and facilitate accurate recording of the responses. Average interview length was approximately 40 minutes. Immediately after concluding the interview, an additional 20 minutes was needed to review and edit interviewer notations, and check for completeness of questionnaire information and tracking documentation.

The number of episodes and the dollar amounts assigned to the closed-ended willingness-to-pay question (Question 32, see page 13, Subject Version of Questionnaire, Appendix 1) were randomly assigned to subjects according to the Treatment Code schedule in Table 3.3-1. Treatments 1 through 10 were randomly assigned in the first mailing of questionnaires to 20 subjects in early April, 1986. After completing 15 of the 20 interviews, ERC and UC Irvine reviewed responses and saw that nearly all subjects said they would pay the highest amount suggested. Indeed, the response to the subsequent open-ended question was typically a higher sum than the highest amount suggested in the close-ended question. A revised treatment schedule was formulated on May 8, 1986; treatments 21 through 28, was used for the remainder of the subject pool (Table 3.3-1).

An additional adjustment was made at this time. Relative to Questions 32 and 33, a high rate of refusals and very high dollar responses were observed for Questions 30a and 30b. This suggested that without the more detailed

Table 3.3-1. Schedule of dollar amounts (treatments) used in close-ended willingness-to-pay question (Question 32)

<u>TREATMENTS</u>	<u>EPISODES</u>	<u>DOLLAR AMOUNTS</u>		
1	4	5	50	200
2	8	5	50	200
3	4	10	25	50
4	8	10	25	50
5	4	25	50	100
6	8	25	50	100
7	4	50	100	200
8	8	50	100	200
9	4	100	200	400
10	8	100	200	400
21	4	10	50	200
22	8	10	50	200
23	4	25	100	300
24	8	25	100	300
25	4	50	200	400
26	8	50	200	400
27	4	100	500	1000
28	8	100	400	1000

Treatments 1-10 were randomly assigned in the first mailing of questionnaires to twenty subjects in early April 1986. After completing 15 of the 20 interviews, ERC and UCI reviewed the success of the dollar amounts in bracketing the range of observed responses, and a revised treatment schedule was formulated on May 8, 1986. The revised schedule, treatments 21-28, was used for the remainder of the subject pool.

Table 3.3-1 cont.

An additional adjustment was made at the time of this revision. It was decided that Questions 30a and 30b should be asked out of sequence, after completing Question 32 and 33. A third digit was added to the Treatment Code to indicate this change of sequence. If Questions 30a and 30b were asked in sequence after completing the line of inquiry on the "typical recent" angina episode, the third digit of the treatment code was assigned a "1." If Question 30a and 30b were asked after the willingness-to-pay Questions 32 and 33, then the third digit of the treatment codes was assigned a "2." For example, Treatment Code 242 represents Treatment 24 (eight episodes, \$25, \$100, and \$300) and Questions 30a and 30b were asked after completing Questions 32 and 33. (Note that this change in sequence was instituted immediately and several individuals in the first treatment schedule were interviewed using the adjusted sequence of waiting to ask Questions 30a and 30b).

context given for the WTP question, subjects had more difficulty making a decision. It was therefore decided that sequencing of Questions 30a and 30b (asking for the maximum dollar amount one was willing to pay to avoid one or two typical angina episodes) should follow completion of Questions 32 and 33, which were introduced by a more careful explanation of the payment situation. A third digit was added to the Treatment Code to indicate this change of sequence (Table 3.3-1). If Questions 30a and 30b were asked in the original sequence, the third digit of the Treatment Code became "1." If Questions 30a and 30b were asked after the willingness-to-pay Questions 32 and 33, then the third digit of the Treatment Code became "2." For example, Treatment Code 242 represents Treatment 24 (eight episodes--\$25, \$100, and \$300) and Questions 30a and 30b were asked after completing Questions 32 and 33.

3.4 Data Analysis

Questionnaire data were coded according to the format described in Appendix 3. Open-ended responses and research subjects' comments were transcribed and assembled by question number (Appendix 4). Data was entered into an IBM personal computer using dBASE III software. Accuracy of the coding and data entry was verified by independent observers. Data files were converted to standard ASCII format, written to floppy diskettes, and distributed among the co-investigators. Specific statistical analyses are described within each section of the Results and Discussion.

CHAPTER 4. RESULTS AND DISCUSSION

4.1 Cost of Illness

4.1.1 Medical Expenditures

Medical expenses associated with anginal pain, and more generally the IHD condition, were estimated for each subject (See Appendix 4). Responses to questions on yearly insurance premiums paid (Question 9b), mileage to physician's office (Question 10), frequency of office visits (Questions 11b and 12a), costs of emergency room visits (Question 15b), hospitalizations (Question 16), medical treatment programs (Question 17), and medications (Question 14) were tabulated.

Annual health insurance premiums ranged from \$0 to \$1002 with a mean of \$201 per subject. Twenty-three subjects made no expenditure for health insurance and largely relied upon coverage from the VA. Nineteen subjects receiving VA health care benefits chose to supplement that coverage with Medicare. Annual Medicare premiums cost \$186. Fifteen subjects were covered by private medical insurance; ten of these subjects also received VA health benefits. For those subjects purchasing private insurance, premiums ranged from \$0 to \$822, with a mean of \$365 per subject.

One-way mileage to the physician's office for a regular checkup ranged from 1 to 45 miles, with a mean of 14 miles. Yearly expenditures for travel to the physician's office were estimated from the number of regular office visits (Question 11a), additional office visits due to angina symptoms (Question 12), round trip mileage (Question 10), and an assumption of personal motor vehicle expense of \$0.205 per mile. Annual mileage expenses ranged from \$0 to \$226, with a mean of \$38 per subject.

In general, the expense of physician office visits, emergency room visits, and hospitalizations was completely covered by the subjects' health insurance benefits. Of 44 subjects reporting visits to their physician during the previous year, nine reported out-of-pocket expenditures ranging from \$12 to \$192; the mean annual office visit expense paid by the subject across the 44 subjects was \$22. No out-of-pocket expenses were incurred by the 13 subjects reporting emergency room visits during the previous year. Of 15 subjects experiencing overnight hospitalizations during the year, two reported out-of-pocket expenses of \$1,000 and \$380, respectively.

Medication expenses were not as well covered by insurance as health services. Fourteen subjects reported paying \$12 to \$1440 during the previous year for heart related medications. The group of 36 subjects whose medication expenses were paid in total by health insurance was largely composed of recipients of VA benefits. Across the sample of 50 individuals, the mean annual out-of-pocket medication cost averaged \$144 per subject.

The sum of all expenses paid by the subject in the aforementioned expense categories, omitting health insurance premiums, provided an estimate of the yearly expenditures made by each subject for ischemic heart disease medical care. Personal annual medical expenditures ranged from \$0 to \$2610, with a mean of \$256 per subject across all 50 subjects. Health insurance costs were omitted from this sum because insurance provided care for a broad spectrum of medical problems, not just ischemic heart disease.

The societal costs of health services for this group are substantial. Societal costs are defined as the expenditures made by insurance companies, or the government in the case of the VA, to provide care. It is important to note that "societal" costs do not include the out-of-pocket expenses incurred by the individual. Societal costs were estimated from medication dosages and

the types of medical services used by the subjects. The cost of medications was estimated using the mean price of generic and name brand prescription drugs distributed by a privately-owned pharmacy and by a major chain pharmacy (Appendix 4). The cost of health services (Appendix 4) was estimated using fee schedules from the UC Irvine Medical Center and the Report on Medical Fees in Southern California (1986). Dennis M. Davidson, MD., a UC Irvine cardiologist, and the UC Irvine Medical Center accounting staff assisted in assembling scenarios of the services likely to be rendered during typical emergency room visits and hospital stays. The estimates derived from these for the cost of hospitalization reflect conservative (i.e., low) estimates of the types and numbers of procedures likely to be associated with the subject's generalized description of the event (e.g., "'emergency room visit for chest pain,' 'angioplasty,' '3-day hospital stay for heart tests'"). It is important to note that professional fees for services are not reflected in these estimates (e.g., anesthesiologist's fee for bypass surgery). It was sometimes possible to use a subject's report of the cost to the insurance company. However, this strategy could only be used in a few instances as the sample was predominantly composed of VA patients who did not receive any billing information. For reasons of patient confidentiality, VA accounting records could not be accessed for estimating cost of services.

The societal costs of medication for the 50 subjects ranged from \$0 to \$2429 per year, with a mean of \$676. Likewise, the societal cost of office visits ranged from \$0 to \$3780 per year, with a corresponding mean of \$576 per subject. The cost to society of the emergency room visits made by 13 subjects ranged from \$77 to \$1364 per year, with a mean of \$342 per subject. Fifteen subjects had been hospitalized during the previous year. The annual cost of hospitalization, including surgical procedures, for these 15 subjects was

estimated to range from \$1630 to \$33,435, with a mean of \$10,607 per subject. These costs include the major medical events of three coronary artery bypass graft surgeries (CABG) and two angioplasty (PTCA) procedures. In summary, annual medical costs to society ranged from \$0 to \$34,963, with a mean of \$4523 per subject across all 50 subjects. This result suggests that the societal burden of angina-related medical expenses is at least ten times that of the personal expenses incurred in this sample of IHD subjects.

4.1.2 Workloss Due to Angina and the IHD Condition

Information was obtained from the subjects concerning the effects of angina on their employment status and time lost from current jobs. This information is summarized in Table 4.1-1. Table 4.1-2 contains definitions for variables used in these calculations. Dollar estimates were developed for three types of work loss: (1) days lost from current jobs due to angina, (2) additional work days desired for those working less than they would like due to angina, and (3) wages lost by subjects who were compelled to give up working due to angina. Dollar values were based on the wages reported by the subjects. For two subjects who refused to give their wages, estimates were made based upon their reported occupations and hours worked.

Fifteen of the subjects (30 percent of the total sample) reported being currently employed. These 15 subjects worked an average of 35 hours per week and earned an average of \$19,400 annually.

Of the 15 employed subjects in the sample, six subjects had missed some days from their regular work schedule in the past year due to angina. The 15 employed subjects missed an average of four days from work in the past year due to angina, incurring an average social cost of \$347 in lost productivity

Table 4.1-1. Workloss due to angina.

	Employed Subjects with Some Workloss Due to Angina	Average Annual Workloss for Employed Subjects (N = 15)	Average Annual Wage Lost for Employed Subjects (N = 15)
15 Subjects Employed (30% of Total Sample)	6	4 days	\$ 347
	Employed Subjects Working Less Than Desired	Average Annual Additional Work Days Desired (N = 6)	Average Annual Wage Lost for Employed Subjects (N = 6)
15 Subjects Employed (30% of Total Sample)	6	108 days	\$3973
			Average Annual Wage Lost for Subjects Not Working (N = 13)
13 Subjects Not Working Due to Angina (37% of Non-Working Subjects)			\$34615

Table 4.1-2. Definitions of variables used to compute wages lost from current employment due to angina

SWLD	Wages lost to subject due to days lost from current employment If Q21DSKLV = 1, then SWLD = Q21CMISS * HRWAGE * 8 If Q21DSKLV = 2, then SWLD = Q21DDAYS * HRWAGE * 8
TWLD	Total wages lost due to days lost from current employment $TWLD = Q21CMISS * HRWAGE * 8$
WKRED	Wages lost to currently employed due to being unable to work as much as desired If Q21FFEWER = 1, then WKRED = 0 If Q21FFEWER = 2, then WKRED = (Q21FLIKE - Q21AHRS) * HRWAGE * 52
JOBLOSS	Wages lost due to having quit working due to angina JOBLOSS = QA21CINC evaluated at the midpoint of the reported range in dollars
SWKLOSS	Workloss in all three categories incurred by subject $SWKLOSS = SWLD + WKRED + JOBLOSS$
TWKLOSS	Total workloss in all three categories $TWKLOSS = TWLD + WKRED + JOBLOSS$
HRWAGE	Hourly wage for currently employed $HRWAGE = Q21GINC / (Q21AHRS * 52)$, where Q21GINC is evaluated at the midpoint of the reported range in dollars For Subject 6, an electronic technician working 62 hours/week estimated annual income was \$35,000 For Subject 16, a clerical employee working 20 hours/week estimated annual income was \$6,000

Additional notes:

1. For Subject 72, Q21DDAYS was recoded from blank to 0 because the subject did have paid sick leave, but did not miss any days due to angina.
2. For Subject 107, Q21DCOVR was recoded from 2 to 1 due to a previous coding error.
3. WKRED was actually calculated on responses from 5 subjects since Subject 16 said he would like to work more but did not give any estimate of how much more.

measured by the wage rate. Only one of the subjects who missed work due to angina had any paid sick leave, therefore the average wage loss incurred by the subjects themselves (\$336) was very close to the total wage loss.

Of the 15 employed subjects, six subjects said they would have liked to work more, but were unable to because of angina. These six subjects currently worked an average of 20 hours per week and would have liked to work an average of 40 hours per week. For these six subjects the average annual wage loss caused by working less hours than desired was \$3973. We assume that this work loss is in addition to occasional sick days lost from a regular work schedule and therefore add these two estimates to obtain total losses for employed subjects. One subject also said he had changed jobs due to angina and had incurred a reduction in income due to this job change. A dollar estimate of this loss was not obtained.

Of the 35 non-employed subjects, 13 said they had ceased to work or had taken an early retirement in the last five years due to their angina. These subjects had earned an average of \$34,615 annually before they ceased working. Assuming that all these subjects would have been working this past year if they could, their previous annual wage was used as an estimate of the annual loss due to being unable to work. To allow more precision in this estimate it would have been preferable to also ask the subjects if they would be working now if they could. Also, disability payments might be mitigating some of this lost income for the subjects causing our estimate of loss to the subject to be overestimated. This does not, however, affect the total loss incurred by society as a whole.

4.1.3 Annual Cost of Illness for Ischemic Heart Disease

The medical expenditures (due to IHD) data in Section 4.1.1 was combined with the income lost due to angina (from Section 4.1.2) to obtain a total cost of illness estimate. The mean annual medical expense and income lost incurred by the individual was \$9,833 for this group of subjects, ranging from \$0 to \$65,374. The mean cost incurred by the individual and others (insurance companies, VA, etc.) per year due to ischemic heart disease was \$14,359, ranging from \$0 to \$67,176.

The focus of this study is the potential effect of changes in CO exposure on the frequency of angina pains. To evaluate the potential welfare impact of changes in CO exposure, we are therefore interested in the effect of a marginal change in angina pain on costs incurred. Regression analysis was conducted relating cost of illness measures to characteristics of the individual illness to determine whether a marginal cost per angina episode could be estimated. The results are shown in Table 4.1-3. Potential explanatory variables included were whether the subject had a heart attack in the previous year (MIYR1), whether the subject had bypass surgery in the previous year (SURGYR1), current monthly angina frequency (MONFREQC), and income. Regressions were estimated with four different cost of illness variables: (1) medical expenses incurred by the subject (MEDSELF), (2) total medical expenses (MEDTOT), (3) medical expenses and income loss incurred by the subject (COISELF), and (4) total medical expenses and income lost (COITOT).

The results indicate that very little of the variation in these cost of illness estimates across this sample is explained by these variables, and angina frequency is not statistically significant in any of the regressions.

Table 4.1-3. Regression analysis relating cost of illness and individual characteristics

Analysis of Variance

Dep Variable: MEDSELF	<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>MEAN SQUARE</u>	<u>F VALUE</u>	<u>PROB > F</u>
	MODEL	4	502001.75970	125500.43992	0.554	0.6969
	ERROR	42	9507502.71	226369.11210		
	C TOTAL	46	10009504.47			
	ROOT MSE		475.7826	R-SQUARE	0.0502	
	DEP MEAN		262.1064	ADJ R-SQ	-0.0403	
	C.V.		181.5227			

Parameter Estimates

<u>VARIABLE</u>	<u>DF</u>	<u>PARAMETER ESTIMATE</u>	<u>STANDARD ERROR</u>	<u>T For H₀: PARAMETER = 0</u>	<u>PROB > T </u>
INTERCEP	1	75.76267837	154.94207071	0.489	0.6274
MIYR1	1	25.38154878	199.90387347	0.127	0.8996
SURGYR1	1	-57.7657	290.00827743	-0.199	0.8431
MONFREQC	1	2.61060003	3.24238982	0.805	0.4253
Q43HINCM	1	0.68142915	0.48939933	1.392	0.1711

Table 4.1-3 cont.

Analysis of Variance

Dep Variable:	<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>MEAN SQUARE</u>	<u>F VALUE</u>	<u>PROB > F</u>
MEDTOT	MODEL	4	2068004458	517001114.57	26.432	0.0001
	ERROR	42	821520312.99	19560007.45		
	C TOTAL	46	2889524771			
	ROOT MSE		4422.67	R-SQUARE	0.7157	
	DEP MEAN		4921.191	ADJ R-SQ	0.6886	
	C.V.		89.8699			

Parameter Estimates

<u>VARIABLE</u>	<u>DF</u>	<u>PARAMETER ESTIMATE</u>	<u>STANDARD ERROR</u>	<u>T For H₀: PARAMETER = 0</u>	<u>PROB > T </u>
INTERCEP	1	2827.35654	1440.27453	1.963	0.0563
MIYR1	1	7026.69540	1858.22002	3.781	0.0005
SURGYR1	1	23400.84420	2695.79161	8.681	0.0001
MONFREQC	1	-20.131	30.13985452	-0.668	0.5078
Q43HINCM	1	-0.75965	4.54924470	-0.167	0.8682

Table 4.1-3 cont.

Analysis of Variance

Dep Variable: COISELF	<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>MEAN SQUARE</u>	<u>F VALUE</u>	<u>PROB > F</u>
	MODEL	4	704973692.90	176243423.23	0.483	0.7483
	ERROR	42	15336119332	365145698.38		
	C TOTAL	46	16041093025			
	ROOT MSE		19108.79	R-SQUARE	0.439	
	DEP MEAN		10445.28	ADJ R-SQ	-0.071	
	C.V.		182.9419			

Parameter Estimates

<u>VARIABLE</u>	<u>DF</u>	<u>PARAMETER ESTIMATE</u>	<u>STANDARD ERROR</u>	<u>T For H₀: PARAMETER = 0</u>	<u>PROB > T </u>
INTERCEP	1	6366.09593	6222.91496	1.023	0.3122
MIYR1	1	-4407.81	8028.70905	-0.549	0.5859
SURGYR1	1	5531.15387	11647.55861	0.475	0.6373
MONFREQC	1	155.39545313	130.22361230	1.193	0.2395
Q43HINCM	1	10.1189970	19.65567146	0.515	0.6094

Table 4-1.3 con't

Analysis of Variance

Dep Variable: COITOT	<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>MEAN SQUARE</u>	<u>F VALUE</u>	<u>PROB > F</u>
	MODEL	4	2552325422	638081355.57	1.619	0.1873
	ERROR	42	16552119378	394098080.44		
	C TOTAL	46	1910444801			
	ROOT MSE		19851.9	R-SQUARE	0.1336	
	DEP MEAN		15104.36	ADJ R-SQ	0.0511	
	C.V.		131.4316			

Parameter Estimates

<u>VARIABLE</u>	<u>DF</u>	<u>PARAMETER ESTIMATE</u>	<u>STANDARD ERROR</u>	<u>T For H₀: PARAMETER = 0</u>	<u>PROB > T </u>
INTERCEP	1	9117.68980	6464.91668	1.410	0.1658
MIYR1	1	2593.50550	8340.93593	0.311	0.7574
SURGYR1	1	28989.76376	12100.51822	2.396	0.0211
MONFREQC	1	132.65382029	135.28785265	0.981	0.3324
Q43HINCM	1	8.67792023	20.42005699	0.425	0.6730

There is a significant relationship between total medical expenses and heart attack or bypass surgery in the past year. In the cost of illness regressions the angina frequency coefficients are positive and might be statistically significant in a larger sample.

Additional information on out-of-pocket costs associated specifically with angina episodes was obtained in the series of questions asked about the subject's most recent angina episode. In response to the question, "If there was any monetary cost to you due to this episode, can you estimate how much it was?" The vast majority of the subjects responded that there was no cost other than the few cents for a nitro tablet. One subject said that there was a cost due to time missed from work. A very serious angina episode might be more likely to cause the patient to seek immediate medical attention, but only a small percentage of episodes would be this serious. A larger sample might find some out-of-pocket cost significantly different from zero with a question like this, but we recommend that the regression approach previously presented also be applied. It is possible that a higher frequency of angina is associated with additional costs (e.g., more medical check-ups) that cannot be easily linked to a specific episode.

These results suggest that the incremental dollar cost associated with a marginal change in angina frequency could be expected to be relatively insignificant. This means that a welfare measure based on cost of illness only would reflect minimal impact on a subject's welfare due to a marginal change in angina frequency. This result, which is not substantiated by other evidence provided by the respondents, makes it all the more important to consider other welfare measures such as willingness to pay and averting expenditures estimates.

4.2 Willingness to Pay

4.2.1 Introduction

A variety of questions were used to obtain an overall picture of the potential effects of changes in angina severity or frequency. Subjects were first asked to rate eight possible effects of an increase in angina on a scale of "bothersomeness" (Question 31). The aggregate rankings of these effects are given in Section 4.2.2. Subjects were also asked whether or not they would be willing to pay specific dollar amounts to prevent a specific increase in angina episodes (Question 32). The analysis of the responses to these close-ended willingness-to-pay questions is in Section 4.2.4. Finally, subjects were asked to specify dollar amounts that they would be willing to pay to prevent a specific increase in angina. Willingness to pay to prevent one and two episodes (Questions 30 and 30b) is analyzed in Section 4.2.3. Willingness to pay to prevent four or eight episodes (Question 33) is analyzed in Section 4.2.5. Special focus is placed on answers of \$0 or very large dollar amounts. The relationship of a person's willingness to pay amount with his other survey responses is analyzed in Section 4.2.6.

4.2.2 Rankings of Effects of Increased Angina

For Question 31, subjects were asked to place eight potential effects of an increase in angina on a scale of 1 to 10, with 1 being the least bothersome and 10 being the most bothersome. Table 4.2-1 shows the mean rating for each category. In some cases the subjects responded that a particular category was not relevant to them. A zero rating was used in these calculations when the

Table 4.2-1. Rating and share means of potential effects of an increase in angina. Percentage shares for each effect are calculated using the total number of points given by each subject for all eight categories, thus providing a normalized measure of bothersomeness (Question 31)

Answers to question: Most bothersome effects you may experience if your angina worsened:

	<u>Rating (1 to 10)*</u>		<u>Share (%)</u>	
	<u>Mean</u>	<u>Std. Error of Mean</u>	<u>Mean</u>	<u>Std. Error of Mean</u>
a. More medical treatment expenses.	3.28	.44	.066	.008
b. Less ability to earn income.	3.24	.53	.061	.009
c. More non-medical expenses (such as paying for services)	3.98	.43	.083	.008
d. More pain or discomfort.	7.84	.35	.181	.012
e. Less ability to work at a job (for reasons other than income).	5.18	.57	.106	.011
f. Less ability to do desired activities (recreation, chores, or work).	8.06	.31	.180	.008
g. More concern to you about potential heart attack or bypass surgery.	7.12	.44	.155	.010
h. More concern to you about worry or inconvenience to family and friends due to your health.	7.46	.42	.167	.011

*1 = least bothersome; 10 = most bothersome.

subject said the category was not relevant. This occurred most often with the income and job performance categories for the subjects who are not employed. It is important to note that these two categories might receive a higher rating if an improvement in angina were being considered rather than a deterioration, especially from subjects younger than retirement age who are not working due to their disease.

The mean ratings are all statistically significantly different except for (f) activity restriction and (d) pain. These two effects were rated as the most potentially bothersome, followed by (h) others' worry and (g) heart attack concern. Job satisfaction was next, followed by the three financial categories. Even though these subjects all had medical insurance, (a) medical expenses received a slightly higher rating than (b) ability to earn income. Ability to earn income may not be an important concern for many of the subjects who are beyond retirement age.

To adjust for possible differences in the subjects' use of the 1 to 10 scale, percentage shares for each category were calculated based on the total number of points given by each subject for all eight categories. The mean shares are also given in Table 4.2-1. The order is the same except that (f) activity restriction and (d) pain are reversed. The mean shares are all statistically significantly different except for (a) medical expenses and (b) ability to earn income.

Simple correlations among the shares were estimated to determine whether the ratings were related to one another. The significant correlations are shown in Table 4.2-2. There were three significant positive correlations: (b) ability to earn income with (e) job performance, (d) pain with (f) activity restriction, and (g) heart attack concern with (h) others' worry. The negative correlations suggest that the subjects who were more concerned

Pearson Correlations of "Bothersomeness Shares" and Personal Characteristics (Question 31)
(P in parentheses)

	a. Medical Expenses	b. Earning Ability	c. Defensive Expenses	d. Pain	e. Job Satisfaction	f. Activity Restriction	g. MI Concern	h. Others' Worry	Married	Household Income	WTP/Income
a. More medical treatment expenses.						-.33 (.02)					
b. Less ability to earn income.				-.30 (.04)	.46 (.00)	-.34 (.02)	-.24 (.10)	-.41 (.00)	-.31 (.03)		.33 (.04)
c. More non-medical expenses (such as paying for services).				-.43 (.00)							-.28 (.08)
d. More pain or discomfort.						.30 (.03)					
e. Less ability to work at a job (for reasons other than income).							-.47 (.00)	-.53 (.00)		.24 (.10)	
f. Less ability to do desired activities (recreation, chores, or work).							-.41 (.00)				
g. More concern to you about potential heart attack or bypass surgery.								.25 (.08)			
h. More concern to you about worry or inconvenience to family and friends due to your health									.40 (.00)		

about financial effects tended to be less concerned about pain, activity restriction, heart attack concern and others' worry.

Some significant correlations with other characteristics of the individuals are also shown in Table 4.2-2. Being married positively correlated with (h) others' worry and negatively correlated with (b) concern about ability to earn income. Annual household income is positively correlated with (e) job satisfaction, suggesting that subjects who earn more also obtain more general job satisfaction. Two of the shares were significantly related to willingness to pay to prevent an increase in angina (Question 33) as a percent of household income: (b) concern about earning ability was positively related, and (c) concern about defensive expenses was negatively related. Characteristics that showed no significant relationship to any of the shares were number of heart attacks, income lost, total defensive expenses, current angina frequency, and willingness to pay to prevent an increase in angina (not as a percent of income).

The effects of subject characteristics on the ratings were further explored by examining the differences between mean shares for groups with different characteristics. These comparisons are shown in Table 4.2-3. Overall, these comparisons reveal differences in ratings that would be expected for subjects in different circumstances, and they support the conclusion that the subjects were able to distinguish among the categories of potential effects and give meaningful ratings to each.

4.2.3 WTP Responses for One or Two Isolated Episodes

Before any of the willingness to pay questions, the subjects were asked to describe a typical angina episode in terms of how it affected them as well

Table 4.2-3. Comparisons of shares to subject characteristics*

Comparison 1: What subjects do on days when expect more Angina (Question 19)

	Activity Restriction Share		
Group 1 - Makes no changes in activities (choice 1)	.148	(.068)	N=9
Group 2 - Avoid active recreation or physical exertion (choice 2 or 3)	.186	(.052)	N=29

Comparison 2: Cost of Illness

	Medical Expense + Income Shares		
Group 1 - Incur some COI (pay some medical expense or lost income)	.144	(.080)	N=25
Group 2 - No COI (100% insurance coverage and no lost income)	.111	(.088)	N=25

Comparison 3: Defensive Expenses

	Defensive Expense Share		
Group 1 - Incur some defensive expense	.097	(.059)	N=21
Group 2 - Incur no defensive expense	.074	(.074)	N=29

Comparison 4: Previous MI

	MI (and Surgery) Concern Share		
Group 1 - Have had no MI	.147	(.065)	N=16
Group 2 - Have had MI	.159	(.075)	N=34

Comparison 5: Previous Bypass Surgery

	MI (and Surgery) Concern share		
Group 1 - Have had no bypass surgery	.169	(.072)	N=27
Group 2 - Have had bypass surgery	.139	(.069)	N=23

Comparison 6: Marital Status

	Others' Worry Concern		
Group 1 - Not married	.111	(.075)	N=11
Group 2 - Married	.183	(.069)	N=39

*Standard Error of Mean in Parentheses

as what they did to minimize the impact (Questions 22-29). Subjects were also asked to recall the single worst episode they had experienced, as well as a typical mild episode. One of the goals of this set of questions was to focus the subjects' thinking on the range of their experience with angina and how it affected them. Additionally, the questions provided some background information about angina from the subjects' point of view.

Subjects were asked what they would be willing to pay to avoid having a typical angina episode tomorrow (Question 30a). If subjects were willing to answer this question, they were also asked what they would be willing to pay to avoid two typical angina episodes in the next week (Question 30b). After the first set of 15 interviews were conducted, it appeared that subjects were having a harder time answering these questions than Questions 32 and 33. Concern was that these questions did not have sufficient introduction to make the willingness to pay question seem realistic, thus resulting in more refusals and potentially affecting the subsequent willingness to pay response. Questions 32 and 33 provided a more, detailed explanation about a hypothetical circumstance under which such a payment might occur.

In an attempt to address this concern, the questions on one and two isolated episodes (Questions 30a and 30b) were asked after Questions 32 and 33 in all subsequent interviews. The questions were deleted from the Subject Version questionnaires mailed to the second wave of subjects, and the interviewer simply read the questions over the phone after Questions 32 and 33 were completed.

Eight of the subjects had particular difficulty answering the questions concerning willingness to pay to prevent one and two episodes. Two of them refused to answer, two said they didn't know, and four said they would pay something but didn't know how much. In addition, two subjects gave extremely

high dollar responses (\$10,000 and \$60,000 to prevent one episode), and four said that they would pay anything to prevent one episode. The two who gave the very high but non-infinite responses stuck to their answers when questioned by the interviewer as to whether that was what they meant. They said that they would be willing to pay anything they could, although they both gave lower estimates when asked Question 33 (both were asked about one and two episodes first). We interpret these very high bids as similar to the infinite responses, the difference being that these two subjects figured out what their income constraints might be. Half of these 14 "problem responses" occurred in the first 15 interviews, suggesting that the sequence change improved responses to this question but some problems remained.

Fourteen problematic responses were observed for Questions 30a and 30b. Seven of these were obtained from the 15 subjects who were asked the questions before Questions 32 and 33. The rate of problematic responses therefore declined somewhat after the order of the questions was changed (7/34 versus 7/15), but problems still occurred.

Table 4.2-4 shows a breakdown of the types of responses obtained for the three open-ended WTP questions. Overall, it appears that the subjects found it easier to answer Question 33 regarding the prevention of an increase in four or eight episodes per month for an indefinite time period. This may be due to 1) the more detailed explanation about the circumstance under which such a payment would be made, 2) the practice obtained with the YES/NO options with Question 32, and/or 3) the more realistic scenario that an overall ongoing change in the subject's condition might occur that would cause an increase in angina each month. With Question 33 there were three more infinite responses, but fewer problem responses of other types. These were discussed and evaluated in a previous section.

Table 4.2-4. Summary of responses to the three open-ended willingness-to-pay questions (Questions 30a, 30b and 33)

	<u>WTP 1 Episode</u>	<u>WTP 2 Episodes*</u>	<u>WTP 4 or 8 Episodes/Month**</u>
Total Subjects Asked Question 32	49	35	50
Zero Response	20	8	7
Non-zero, Non-infinite Response	17	16	35
Infinite Response	4	4	7
Response of \$10,000 or More	2	2	0
Don't Know, But Something > 0	4	3	0
Don't Know	2	2	0
Refusal	2	2	1

*12 of the 14 not asked had given \$0 to WTP for one episode, the other two were "don't know" responses to WTP for one episode.

**Numbers in this column reflect adjustments made in 3 responses discussed in text: two "don't know, but something > 0" responses were changed to dollar amounts based on their responses to Question 32, and one refusal was changed to zero based on the verbal explanation given.

Of particular interest with respect to the WTP responses concerning one episode is that more than half of the subjects who gave a dollar value said zero dollars. The explanation of this response by all but one of the 20 subjects was that it would not be worth anything to them to prevent just one episode. The one subject said he could not afford to pay anything. Several added further comments that supported the explanation that one angina episode more or less really didn't matter that much. What mattered they said would be an overall change in their condition. Therefore, these 20 zeros were interpreted as true zero bids for preventing a single angina episode.

The means of the dollar responses concerning one and two episodes are as follows (excluding the two very high responses, but including all zero responses):

WTP for One Episode	WTP for Two Episodes
\$64 (N=35)	\$165 (N=22)

These means are not directly comparable because twelve subjects who said zero to one episode were not asked about two episodes. This was a misinterpretation of the instructions to the interviewers to skip the two-episode question if the subject refused to answer the question concerning one episode. A zero response should not have been interpreted as a refusal. If these twelve zeros are removed from the first mean, as well as a \$20 response from a subject who then said he didn't know for two episodes, the two means are more comparable:

WTP for One Episode	WTP for Two Episodes
\$100 (N=22)	\$165 (N=22)

Of these 22 subjects, two gave infinite responses to Question 33. Due to the small sample size and the apparent lack of difference in responses for four or eight episodes (see Section 4.2.5), we have combined these responses for this comparison. The means for the remaining 20 subjects for all three WTP questions are:

WTP for One Episode	WTP for Two Episodes	WTP/Month for Four/Eight Episodes/Month
\$61 (N=20)	\$82 (N=20)	\$200 (N=20)

Comparing just the responses for one episode to the four or eight episodes allows 10 zero responses for one episode to be included, and the sample increases to thirty:

WTP for One Episode	WTP/Month for Four/Eight Episodes/Month
\$41 (N=30)	\$145 (N=30)

These means suggest declining marginal utility for avoiding an increasing number of angina episodes and show general consistency in responses to the three difference questions in terms of the order of magnitude of the per-episode value. The comparison of the means, however, masks a few problems that should be noted. One is the significant number of zeros (higher variance) given for one and two isolated episodes, keeping the mean responses to these questions low. Another is that several subjects gave fairly high

responses to the question regarding one episode and then didn't increase the response very much for two. It appears from the recorded comments that many subjects may have been focusing on how much they could afford to pay for a reduction in angina but not focusing on the exact amount of angina being avoided, and therefore responded with an estimate that was more related to their budget constraint than to the amount of angina. This tended to bring the means for one and two episodes closer together, giving the impression of declining marginal utility, and perhaps upwardly biasing responses for one or two episodes.

A look at the responses for each individual across the three questions provides some additional, and inconclusive, information about whether the responses show a declining marginal utility for additional episodes reduced. There were 27 non-infinite dollar responses to Questions 30a and 30b that could be compared with the non-infinite, non-zero responses to Question 33. Of these, 11 said zero for one episode, four showed increasing values per episode, and 12 showed equal or decreasing values per episode for the one- and two-episode questions. Of the 12 sets of responses that were consistent with equal or declining marginal utility for additional episodes reduced, four gave the same amount for preventing one or two episodes, and eight gave double the amount for two than for one. Of these same 12 subjects, six showed equal or declining marginal utility across all three questions.

Overall, the responses do not provide conclusive evidence of declining marginal utility for more episodes prevented. The most that can be said is that a good share of the responses, although by no means all of them, show some logical consistency across the different WTP questions. This question is also addressed in the cross-sectional analysis of the WTP responses reported in Section 4.2.5, where there is again no conclusive evidence of declining marginal utility.

4.2.4 Willingness to Pay to Prevent Degradation of Health Status: Analysis of the Close-Ended WTP Responses

In Question 32, subjects were asked if they would pay a given amount per month to prevent an increase of either four or eight angina episodes per month. If they responded "yes," then they were asked if they would pay a specified higher amount, and if they responded "yes" again they were asked if they would pay a third specified higher amount. Question 32 was worded as follows: "Suppose your heart condition were to become worse so that with your current medical treatment and lifestyle your angina episodes would occur more often. Suppose also that a new medical treatment were available that could prevent the additional angina without causing undesirable side effects or requiring lifestyle changes. If the treatment would prevent _____ additional angina episodes per month and you had to pay the entire cost yourself, would you take the treatment if it cost \$_____ each month? (Yes/No) Would you take the treatment if it cost \$_____ each month? (Yes/No) Would you take the treatment if it cost \$_____ each month?"

Payment amount combinations were randomly assigned, and these combinations were previously described in Table 3.3-1.

Overview of Responses

Two subjects refused to answer the close-ended WTP questions. One of these subjects refused to answer all income and financial questions. Another subject said that he wasn't able to decide whether he would be willing to pay the amount asked. Six subjects said they would not pay the first amount

asked. All of these subjects also said they would not pay anything to prevent an increase in angina in response to Question 33. Three of these subjects said that they could not afford to pay anything, one said it would not be worth anything to avoid that amount of angina, and two said that what mattered was their overall heart condition, not a few more angina episodes.

Question 32, the close-ended WTP question, combined three questions to bound the amount a subject was willing to pay to prevent additional angina. With two refusals and three questions for each subject, a total of 144 responses was obtained. When a subject said "no" to one amount, the interviewer went on to Question 33, and the response for any subsequent higher amounts was coded as "no." About two-thirds of the responses were "yes." The responses are summarized in Table 4.2-5 and are separated according to the question sequence. As expected, the percentage of "yes" responses declined as the amount increased. For all amounts under \$200, more than half of the responses were "yes." At \$200, the split was 50/50, and for all amounts above \$200, one-half or more of the responses were "no."

Analysis of the Responses

Analysis of the close-ended responses was based on the following utility model. This section follows Hanemann (1984).

$$U = U(A, Y, S) \quad (4-1)$$

Where:

- U = an individual's utility
- A = angina episodes per month
- Y = income (representing all consumption)
- S = socioeconomic characteristics of the individual

Table 4.2-5. Summary of responses to the close-ended willingness-to-pay question (Question 32)

Close-Ended WTP Question Responses

Dollar Amount	Total No. Subjects Asked*	Total Response		First		Question Sequence		Third	
		Yes	No	Yes	No	Second		Yes	No
						Yes	No		
\$5	4	4 (100%)	0 (0%)	4 (100%)	0 (0%)	--		--	
\$10	7	6 (86%)	1 (14%)	6 (86%)	1 (14%)	--		--	
\$25	18	16 (89%)	2 (11%)	13 (93%)	1 (7%)	3 (75%)	1 (25%)	--	
\$50	24	20 (83%)	4 (17%)	7 (78%)	2 (22%)	10 (91%)	1 (9%)	3 (75%)	1 (25%)
\$100	29	22 (76%)	7 (24%)	12 (86%)	2 (14%)	8 (73%)	3 (27%)	2 (50%)	2 (50%)
\$200	20	10 (50%)	10 (50%)	--		5 (42%)	7 (58%)	5 (63%)	3 (38%)
\$300	10	2 (20%)	8 (80%)	--		--		2 (20%)	8 (80%)
\$400	12	5 (42%)	7 (58%)	--		--		5 (42%)	7 (58%)
\$500	10	5 (50%)	5 (50%)	--		5 (50%)	5 (50%)	--	
\$1000	10	3 (30%)	7 (70%)	--		--		3 (30%)	7 (70%)
Total	144	93	51	42	6	31	17	20	28

*Each subject was asked three different dollar amounts. Two subjects refused to answer these WTP questions. Therefore, a total of 144 responses obtained from 48 subjects.

In Question 32, potential changes in A and in Y were hypothesized. The subject's initial utility is

$$U^* = U(A_0, Y, S) \quad (4-2)$$

Where:

A_0 = the initial level of angina.

Question 32 posed a choice between making a specified payment, X, or having angina frequency increase to A_1 , where A_1 is either $A_0 + 4$ or $A_0 + 8$. Thus, the subject chose between:

$$U_0 = U(A_0, Y-X, S) \quad (4-3)$$

and

$$U_1 = U(A_1, Y, S). \quad (4-4)$$

Because some components of these utilities are unobservable to the investigator, they can be treated as stochastic, so that U_0 and U_1 are random variables with means of $v(A_0, Y-X, S)$ and $v(A_1, Y, S)$, and distributed according to some probability distribution. U_0 and U_1 can thus be written as:

$$U_0 = v(A_0, Y-X, S) + e_0 \quad (4-5)$$

$$U_1 = v(A_1, Y, S) + e_1. \quad (4-6)$$

The probability that the subject will be willing to make payment X rather than have angina increase to A_1 is given by the probability that U_0 is greater than or equal to U_1 :

$$P_0 = \Pr \{ v(A_0, Y-X, S) + e_0 \geq v(A_1, Y, S) + e_1 \}. \quad (4-7)$$

If we define $E = e_1 - e_0$ and let $F_E(.)$ be the cumulative density function of E , then the probability of being willing to pay amount X may be written as:

$$P_0 = F_E(\Delta v), \quad (4-8)$$

where

$$\Delta v = v(A_0, Y-X, S) - v(A_1, Y, S).$$

In the probit model $F_E(.)$ is the standard normal cumulative density function. In the logit model it is

$$P_0 = F_E(\Delta v) = 1/(1 + \exp(-\Delta v)). \quad (4-9)$$

Hanemann concludes that the argument of F_E must take the form of a utility difference to be consistent with the economic hypothesis of utility maximization. He suggests two examples: a linear utility function and a log-linear utility function. Using a linear function, the utility difference is given by:

$$\Delta v = (\alpha + b_1 A_0 + b_2 (Y-X) + b_3 S) - (a' + b_1 A_1 + b_2 Y + b_3 S) \quad (4-11)$$

$$= a^* + b_1 \Delta A - b_2 X \quad (4-12)$$

where:

$$a^* = a - a', \text{ and}$$

$$\Delta A = A_0 - A_1 \text{ (taking a value of -4 or -8).}$$

It would be expected that b_1 is less than or equal to zero because the probability of agreeing to pay X would probably increase when ΔA goes from -4 to -8. It would be expected that b_2 is greater than or equal to zero because as $-X$ decreases (X becomes larger) the probability of agreeing to pay X probably decreases.

The estimation results of the logit form of equation 4-12 are shown in Table 4.2-6. The coefficient b_2 for the X variable, the amount the subject was asked to pay, is statistically significant and has the expected sign. The coefficient b_1 on the change in angina hypothesized does not have the expected sign and is not statistically significant. This is consistent with the finding in the analysis of the open-ended responses that there was not a significant difference in asking about an additional four or eight more episodes.

In order to show the implications of the estimated coefficients, X' is defined as the amount at which Δv is zero. This is the amount where the probability of saying "yes" is 0.5, which can be interpreted as a point of indifference between making the payment or having the change in angina. Evaluated at the sample mean of NCHANG (-5.84 angina episodes per month), X'

Table 4.2-6. Logit analysis of responses to the close-ended willingness-to-pay question (Question 32)

A. $\Delta v = a + b_1 (\text{NCHANG}) + b_2 (\text{NPAY})$

$X^1 = a/b_2 + (b_1/b_2) (\text{NCHANG})$

Full Sample (N = 144)

Variable	Estimated Coefficient	Standard Error	Prob
Intercept (a)	2.190	.646	.0007
NCHANG	.1430	.095	.1323
NPAY	.0033	.00085	.0001

$X^1 = \$411$ (at NCHANG = -5.84)

B. $\Delta v = a + b_1 (\text{NPAY})$

$X^1 = a/b_1$

Full Sample (N = 144)

Variable	Estimated Coefficient	Standard Error	Prob
Intercept (a)	1.324	.259	.0001
NPAY	.0032	.00084	.0001

$X^1 = \$414$

C. Subsample with Non-Infinite Responses to Question 33 (N = 123)

Variable	Estimated Coefficient	Standard Error	Prob
Intercept	1.951	.703	.0055
NCHANG	.1306	.101	.1952
NPAY	.0037	.001	.0002

$X^1 = \$321$ (at NCHANG = -5.84)

Note: NCHANG = $A_0 - A_1$
NPAY = -X

is \$411. This is about twice the mean of the non-infinite responses to Question 33. It would be expected that this value would be higher since those who said they would pay anything are included. To test the impact of the insignificant b_1 coefficient on this estimate of X' , the equation was estimated assuming $b_1 = 0$. The X' value was essentially equivalent at \$414.

To determine the extent to which these X' values may be influenced by the subjects who said they would pay anything and by the subjects who said they would pay nothing, the logit estimation was repeated for the subjects who gave non-zero and non-infinite responses to Question 33. The results are reported in Part C of Table 4.2-6. The coefficients are quite similar to those estimated for the whole sample, but they do result in a considerably lower X' value of \$321.

4.2.5 Willingness to Pay to Prevent Degradation of Health Status:

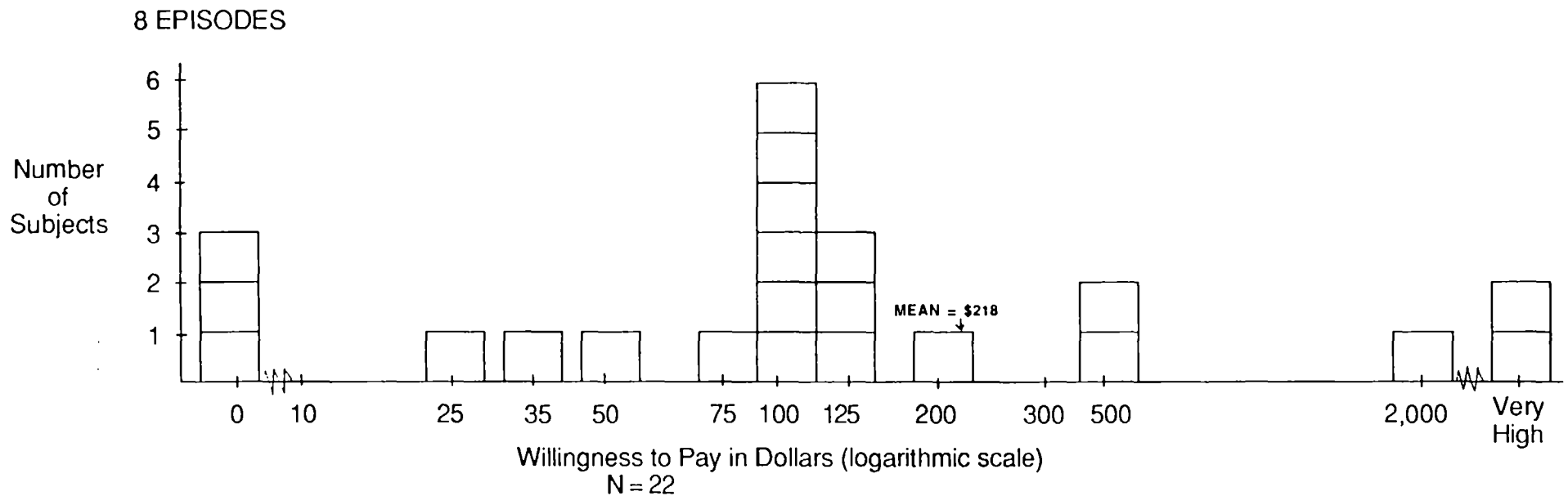
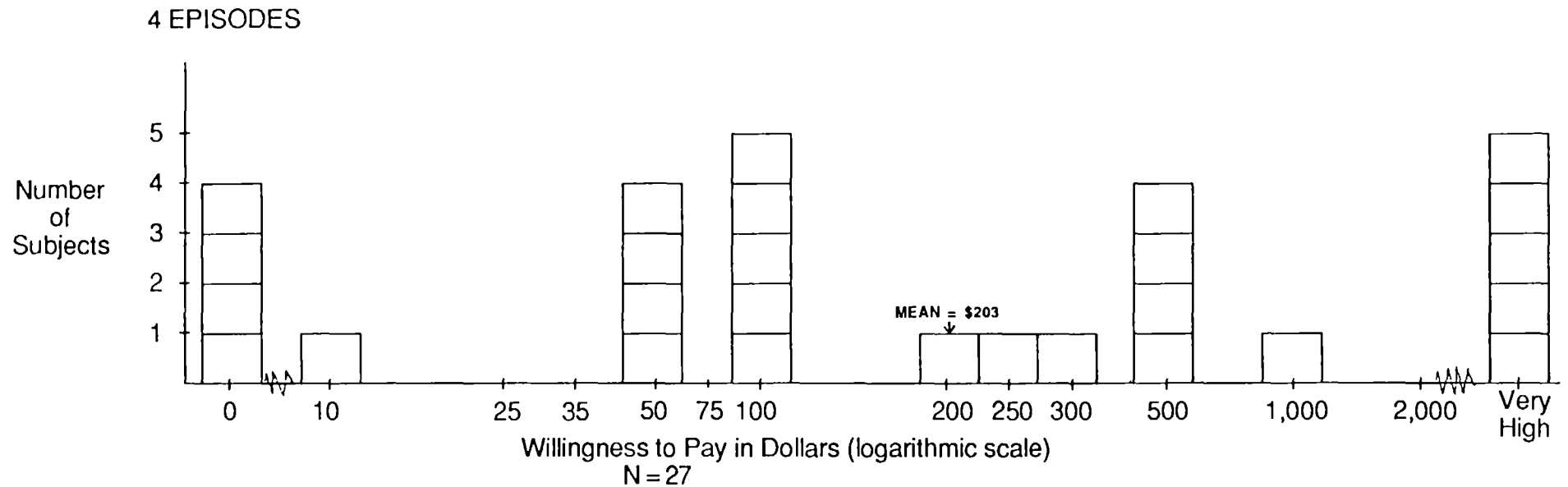
Evaluation of Open-Ended WTP Question

In an attempt to obtain a dollar estimate of the total value (utility) angina patients place on preventing a deterioration in health status, we asked an open-ended question immediately after Question 32.

(Question 33): "What is the most that you would pay for this treatment if it would prevent (four or eight) additional episodes per month?"

Responses to this question are graphed in Figure 4.2-1. Half the subjects were asked the amount they were willing to pay to avoid four additional episodes this month. The other group was asked about eight episodes. Two

Figure 4.2 - 1 Willingness-to-pay in dollars to prevent an additional four or eight episodes of angina



major patterns of response were observed. First, both groups were willing to pay similar dollar amounts to avoid angina. The average WTP for avoiding eight additional episodes (\$218) is only \$15 more than the average WTP to avoid four additional episodes (\$203). These means include all non-infinite responses. Second, a sizable number of subjects (6 of 50 = 12%) said they would pay nothing to avoid the increased angina while another group (7 of 50 = 14%) said they'd give everything they had to avoid additional angina episodes.

In the next sections the responses of zero and of very high amounts are evaluated to determine whether they should be accepted as true responses or treated as protests. The responses shown in Figure 4.2-1 reflect a few adjustments made on the basis of this evaluation.

Responses of Zero

Six of the 50 subjects gave zero as the maximum amount they would be willing to pay to prevent the increase in angina. Subjects who gave zero were asked a follow-up question to help determine whether their responses indicated that they really would pay nothing to prevent such an increase or whether they gave this answer because they objected to or did not believe the premises of the question. After considering the explanations given by these subjects, all six zeros were retained as valid responses. In addition, one subject's response was changed from a refusal to a zero because his explanation was similar to that given by other subjects who said zero. This subject had said no to the specific dollar amounts in Question 32.

Two of these subjects said that it would not be worth anything to prevent that much angina, three subjects said that they could not afford to pay anything, and one subject gave both explanations. Subject 16 said that it

didn't matter unless the heart was in good condition, that more or less angina didn't matter that much. One of the other subjects gave a similar explanation saying, "I would mortgage my house and pay \$100,000 to be rid of all my angina, but I would not pay to avoid eight episodes." This subject currently had angina about twice a day. Five of these seven subjects reported having angina once a day or more, and apparently several of them felt that an increase of four or eight episodes a month would not be worth paying to prevent, although a significant improvement in their overall condition would be worth a great deal.

All but one of the subjects who gave a zero response to Question 33 had also said no to the amounts suggested in Question 32. One subject had, however, said yes to \$100 (the first amount asked for that subject in Question 32) and no to the second higher amount. When asked Question 33 the subject said zero and explained that he really couldn't afford even the \$100 he had previously said yes to. This suggests the possibility that in a close-ended question some subjects will go along with a higher amount than they would actually be willing to pay. Some similarly inconsistent responses are discussed below. This is something that should continue to be checked in future efforts of this type.

Refusals

Four subjects refused to give a dollar response to Question 33. After evaluating the comments and other answers given by each of these subjects, one of these responses was retained as a refusal and the other three were recoded to some dollar amount. As discussed in the previous section, one refusal was recoded to zero because the explanation given by the subject indicated that

the change in angina posed by the question was not significant to him relative to his overall condition.

Two of the remaining three subjects said that they would be willing to pay something, but refused to give a dollar amount. Their responses to the previous Question 32 were used to estimate a maximum amount that they would be willing to pay. One subject had said yes to \$25, \$100 and \$300, but when asked Question 33 this subject had said the amount he would be willing to pay would be less than \$300. His response to Question 33 was therefore recoded from a refusal to \$100. The second subject had said yes to \$25 and \$100, and no to \$300. This subject said he would be willing to pay something in response to Question 33, so \$100 was entered as a response for this subject.

Very High Responses

Seven subjects said that they would pay "anything" to prevent the increase in angina. Several of these subjects recognized by their responses that there would be a limit to the amount of money they could actually pay, but many of them explicitly said that they would sell or mortgage their houses. All these subjects had said yes to every dollar amount asked in Question 32. They emphasized in their explanations that they would place a very high value on preventing an increase in angina. In contrast to the subjects who said zero for Question 33, only one of these seven subjects currently had one or more angina episodes a day. Thus, an increase of four or eight episodes represents a very significant worsening the angina condition for most of these subjects.

All of the very high responses appeared to be sincere indications of a willingness to pay any amount possible to prevent additional angina,

reflecting that such an increase would have a very significant impact on these individuals. None of these responses appeared to be a protest against the question, as is sometimes observed with willingness to pay questions.

The highest dollar amount that these subjects were asked in Question 32 could be interpreted as a minimum estimate of the amount each individual would be willing to pay. These amounts were as follows:

Highest Amount	Number of Subjects
\$1000	1
400	1
200	3
50	2

Consistency of Close-Ended and Open-Ended Responses

A comparison was made between responses to Question 33 and the highest amount the subject said he would pay in response to Question 32. Five inconsistencies were observed in which subjects gave a lower amount for Question 33 than the highest amount they had said "yes" to in Question 32. The amounts involved in each case were as follows:

Subject	Amount Agreed to in Question 32	Amount Given in Question 33
7	\$500	\$100
22	\$1000	\$200
24	\$1000	\$500
109	\$100	\$0
106	\$300	\$100

Four of these subjects offered the explanation that they really could not afford the higher amount. The other said something to the effect that he

would pay the higher amount if he really had to and the treatment worked. It appeared there might be a tendency for some subjects to go along with a higher amount when the question was asked in the form of a yes/no format. In the subsequent analysis of the open-ended responses, the lower amount given in Question 33 was used. This appears to be a more accurate estimate of the maximum WTP for these subjects.

High Responses Relative to Income

The responses to Question 33 were evaluated relative to the reported household income to determine whether any individuals had given unrealistically high responses relative to their apparent ability to pay. It should be noted that current income is only one indication of the ability to pay as it does not take into account accumulated wealth (such as homes) that individuals may have.

The willingness to pay as a percent of monthly household income was calculated yielding an average of 16 percent. This percentage figure was distributed as follows across the 40 subjects who provided a finite dollar response to the WTP question and answered the income questions.

WTP as Percent of Monthly Income	Number of Subjects
0- 9%	23
10-19	9
20-29	3
30-39	1
40-49	1
50-59	0
60-69	0
70-79	0
80-89	1
90-99	0
100 or more	2

Three responses stand out as being at the high end of the distribution. The information available about each of these subjects was evaluated to determine whether these high responses might be reasonable for these individuals. This information is reported in Table 4.2-7. In light of the apparent sincerity of the very high responses discussed in the previous subsection, it is possible that these high values relative to income are of a similar nature. The information about the three subjects does not contradict this interpretation and the responses were kept as probably valid.

Average WTP After Adjustments

Three different WTP estimates were defined based on responses to Questions 33 and 32. Q33PAYM was defined as the response given to Question 33, with Subject 16 recoded from refusal to \$0 and Subject 2 and Subject 106 recoded from refusals to \$100. The remaining refusal and the very high responses were treated as missing values. Q33ADJ1 was defined as equivalent to Q33PAYM, except the highest value the subject accepted in Question 32 was used if the subject gave a very high response to Question 33. Q33ADJ2 was equivalent to Q33PAYM, except the monthly income was included for subjects who gave very high responses. Q33ADJ1 therefore incorporates the very high responses in a conservative way, and Q33ADJ2 gives an upper bound to the extent that payments are limited by current income.

The means and standard errors of the means for each of the measures are reported in Table 4.2-8. The means for Q33PAYM and Q33ADJ1 are quite similar. The mean for Q33ADJ2 is about twice as large as the other two. When separated for four or eight angina episodes, the means are not statistically

TABLE 4.2-7. Evaluation of High WTP Responses Relative to History of Heart Disease and Income

Subject	Question 33 Response	Monthly Household Income (range)	Bypass Surgery	Heart Attacks	Current Angina Frequency	Current Angina Severity	Response to Question 32	Annual Workloss (SWKLOSS)	Annual Defensive Expenditures (DEFCOST)	Additional Comments
#24	\$ 500 recoded to \$1000	\$ 625 (417-833)	yes	2	2/month	3	\$ 100 yes 500 yes 1000 yes	\$ 0	\$ 750	"Would pay \$1000 if had to and if it really worked"
#89	\$ 250	\$ 208 (0-417)	no	1	3+/day	5	\$ 50 yes 100 yes 200 yes	\$65000	\$ 0	
#94	\$2000	\$1875 (1667-2083)	yes	2	4/month	4	\$ 100 yes 200 yes 400 yes	\$ 9087	\$12780	"You pay as much as you can afford"
Sample Average			.46	1.5	15/month	3.7		\$ 9577	\$ 904	

Table 4.2-8. Mean responses to the open-ended WTP Question 33. Responses are adjusted for consistency with WTP dollar amounts elicited from the close-ended Question 32. Q33ADJ1 is equivalent to Q33PAYM except that the highest value accepted in Question 32 was used for subjects who gave very high responses to Question 33. Q33ADJ2 is equivalent to Q33PAYM except that monthly income was used for subjects who gave very high responses

	<u>Q33PAYM</u>	<u>Q33ADJ1</u>	<u>Q33ADJ2</u>
All subjects	\$210	\$223	\$499
	(SE _̄ = 54)	(SE _̄ = 49)	(SE _̄ = 121)
	_x	_x	_x
	(N = 42)	(N = 49)	(N = 49)
4 episodes	\$203	\$204	\$590
	(SE _̄ = 54)	SE _̄ = 45)	(SE _̄ = 177)
	_x	_x	_x
	(N = 22)	(N = 27)	(N = 27)
8 episodes	\$218	\$246	\$387
	(SE _̄ = 99)	SE _̄ = 97)	(SE _̄ = 163)
	_x	_x	_x
	(N = 20)	(N = 22)	(N = 22)
WTP/episode	\$40	\$42	\$103
	(SE _̄ = 9)	(SE _̄ = 8)	(SE _̄ = 27)
	_x	_x	_x
	(N = 42)	(N = 49)	(N = 49)

different. This suggests that four and eight episodes per month were not viewed as significantly different by the subjects, or at least that no difference shows up cross-sectionally for a small sample of subjects with current angina frequency varying from zero episodes per month to 90 or more episodes per month. This is discussed below and explored further in the analysis of the willingness to pay responses.

The average WTP per episode was \$40 for Q33PAYM, \$42 for Q33ADJ1, and \$103 for Q33ADJ2. Although the latter is about two and one-half times the other two values, it suggests that if the subjects who gave infinite responses are taken into account, a value per episode is likely to be between \$50 and \$100.

Another summary statistic of interest is that the median and the mode for each of these measures is \$100. This is true for four episodes and eight episodes. The median and the mode of the anchoring values asked in Question 32 are also \$100, indicating that these values may have influenced the responses to Question 33. This observation is explored further in the analysis of the WTP responses (Section 4.2.5, subheading "Survey Instrument Influences").

Lack of Differences Between Responses Concerning Four and Eight Episodes of Angina

The similar aggregate patterns of responses to the four and eight episode WTP questions might be interpreted in at least four ways, assuming the subjects in the two groups are similar on other characteristics. It must be emphasized that these are hypotheses for future research, not conclusions of the study.

First, relative to the wide range of angina severity/frequency experienced by the subjects, four and eight episodes per month may not be perceived as a very different health level. For example, for subjects currently having angina twice a day, four or eight episodes a month may not seem like very much, while subjects having angina once a month may see both four and eight added episodes as a significant increase. With the small sample size, it may be difficult to detect small real differences in WTP.

Second, the responses may show rapidly decreasing marginal value (utility) for avoiding additional episodes. This possibility was explored in Section 4.2.3, in which responses for willingness to pay for one or two isolated angina episodes are reported. The data are inconclusive regarding the presence of declining marginal utility for additional episodes reduced.

Third, the responses for willingness to pay for preventing additional episodes may have been at the maximum possible level regardless of the amount of angina reduced. Responses and comments suggest that some subjects were focusing more on what they could afford to pay than on the amount of angina being hypothesized. In Questions 30a and 30b, each subject was asked his willingness to pay for avoiding both one and two episodes. From a few subjects' comments, it was seen that income constrained some answers. For example, when asked about paying to avoid one typical angina episode, Subject 18 answered \$100 and added "I just don't have the money. If I made a salary then I'd pay more. I'd have to consider what would happen to my family if I paid more." For two episodes the subject also answered \$100, stating, "Just couldn't pay any more." Subject 22 answered \$500 for both one and two episodes and stated "\$500 is the most I can give for 1, 2, 5 or whatever." Similarly, some subjects would have paid everything they had to avoid 1, 2 or more additional episodes.

These subjects may have given a response indicating how bad additional angina would be, but the response was not specific to a certain number of episodes. This is likely to happen if people have difficulty separating angina symptoms from IHD as a whole. If this was the case, using a variable such as "willingness to pay to avoid x additional angina episodes" in a model for evaluating CO may be inappropriate.²

Further, it may be the case that decision-based valuation questions are inappropriate for exploring the impacts of angina on subjects because they oversimplify the issue. When asked to give a dollar amount to avoid a specific number of episodes, a subject may respond to the "demand" for an answer even though the question is not consistent with how he views his symptoms. Much of the subject's behavior results from many small decisions or changes that become habits. Long-term angina sufferers may be able to describe their habits (such as resting whenever short of breath), but not be able to describe the tradeoffs they made in acquiring those habits. Hypothetical decision questions, such as asking for a decision on an amount to pay to avoid excess angina, are framed with a context and a response mode which may not match the patient's perspective. For example, some subjects who no longer work indicated that this wasn't bothersome at all anymore, though it did bother them in the past. See Keller and Lambert (1986) for a discussion of the problem of measuring habitual behaviors via decision questions. In

²In fact, clinical laboratory research has shown that CO aggravates angina, but it is still unclear whether it increases the risk of myocardial infarction. If it is found that CO doesn't increase risk of death, then it would be important to explain to subjects the health effects of increased angina and to separate risk of death from other effects. We probed the subjects' opinions on the relationship between angina and heart health in Question 37; 60 percent (N = 50) of the subjects said their heart is probably not harmed when they have an angina episode (indicating the angina is simply their bodies' warning to slow down). Thirty-six percent said their heart may be harmed a small amount; half of these people believe it probably does not heal and half believe it probably does heal.

this questionnaire, it was suspected that subjects could make more sense of hypothetical tradeoffs when the more realistic context was used (in Questions 32 and 33) of an ongoing change in health status rather than one episode (as in Question 30). In general, the responses to the defensive expenditures questions indicate that subjects did make direct tradeoffs that they were aware of.

There are other potential problems with using WTP measures to value angina reduction. It is important to mention these problems, and great care was taken in designing the questionnaire to prompt subjects after certain WTP responses to give their reasons behind the response. First, patients may discount their willingness to pay to avoid angina if they see angina as an early warning to slow down before precipitating a myocardial infarction. Second, patients "pay" to avoid attacks by avoiding exertion, rather than spending money. Finally, reducing the number of angina attacks (without a complete cure) may not reduce the psychological and behavioral effects on the patient, his family and friends (Keller and Lambert, 1986).

Bimodal Distribution of WTP Responses

It may seem paradoxical that some angina patients indicated they would pay zero to avoid added angina attacks while others said they would pay everything they had to avoid the next episode(s). One exploratory analysis using cross tabulations of the WTP responses versus responses to the health, attitude, and demographic questions did not reveal any systematic differences between those responding zero and those responding "everything they own". (An alternative analysis based upon disease and surgery history in Section 4.2.6 is more promising.) The Classification and Regression Tree (CART) software

package by Breiman et al. (1984) for classifying items (i.e., angina patients) into homogeneous categories, based upon multiple characteristics (i.e., responses to survey questions), did not work on this data set due to small sample size and relatively homogeneous responses. As reported in Section 4.2.6, the dollar amount all subjects (not just those giving zero or very high responses) were willing to pay to prevent four or eight episodes was significant and positively related to annual household income, to having had coronary artery bypass surgery, etc.

McClelland et al. (1986) have found a similar pattern of responses for WTP bids for insurance to protect against a \$4 or \$40 loss in an experimental laboratory setting. They found a bimodal distribution of bids, with one mode at or near \$0 and the other mode a high amount, above the expected value of the monetary risk being faced. This pattern occurred when the probability of loss was low (10 percent or 1 percent). Since the probability of death following one angina episode is low, it may be useful in further research to explore whether the behavior observed in these "low probability of loss" laboratory experiments can give us clues to the angina patients' response pattern. McClelland et al. (1986) hypothesized that the bimodal answers resulted from the influence of two cognitive processes: editing, and anchoring and adjustment.

In the angina context, these processes can be used to interpret the zero and everything answers given by some subjects. First, editing refers to a stage prior to decision making when a person simplifies a problem by selectively focusing on only some of the possible outcomes and the perceived chances of those outcomes. The simplified problem is then used as the model for decision making. When facing one or a few additional angina episodes, some subjects may have considered the probability of death from the episode(s)

as being very small and edited the problem by considering this probability virtually zero. Then, paying zero to avoid an added episode makes sense when the probability of death is seen as zero. Some subjects' comments indicated they were focusing on the insignificance of the marginal change in symptoms being hypothesized, especially when they were currently experiencing a great deal of angina.

Second, some people may be anchoring on the possible loss from ischemic heart disease as a whole (severe pain, total incapacitation or even death from a heart attack). They then consider how much they'll pay to avoid this loss (everything they have) and adjust downward since the loss will not occur for sure. Some subjects' comments indicated they were focusing on the significance of their disease in a larger sense and on how they would do "everything" to improve it. However, although the coefficient on the variables "concern about heart attack" was positive in the willingness-to-pay regressions, it was not very significant. So, some subjects may have focused on the disease as a whole and others may have narrowed the focus to just angina. Even if death from IHD is not considered, other aspects of the disease such as worry to family and friends and ability to hold a job may enter into the decision process.

In the McClelland et al. (1986) laboratory experiments, the fraction of subjects who bid \$0 increased when there were repeated trials without experiencing the loss. Similarly, the dollar amount of bids by those stating a positive amount decreased when there were repeated trials without loss. This suggests that angina subjects who have not experienced a myocardial infarction recently might be more likely to bid \$0 than others. Unfortunately, due to a small sample size, it was not possible to statistically test this hypothesis. Table 4.2-9 contains a cross-tabulation

Table 4.2 - 9 Number of years since myocardial infarction and willingness-to-pay to avoid four or eight angina episodes

		This Year 1986	Last Year 1985						14 Years Ago (72)	Row Total
		0	1	2	3	4	11	12	14	
No Money	0		1	1	1	1	1	1		6 18.8%
Some Money	1	3	3	9	3	3	1		1	23 71.9%
Infinite Money	2			1	1				1	3 9.4%
Column Total		3 9.4%	4 12.5%	11 34.4%	5 15.6%	4 12.5%	2 6.3%	1 3.1%	2 6.3%	32 100.0%

of the number of years since a myocardial infarction (for the 32 subjects who had them) and response to the willingness to pay question about either four or eight episodes (Question 32). Unfortunately, this does not reveal a suggested pattern. Future surveys should ask the subject how long he has had angina, since behavior and judgment processes may have altered over the course of the disease.

A less plausible reason for the observed zero and infinity answers is that subjects might have been framing the problem in two different ways. Some subjects may have been framing the problem as the amount they were willing to pay to avoid decrements in health status (the original intent of the questions) and others may have framed the questions as the amount of compensation they would demand from an agent who will cause adverse health effects. At least one subject considered different problem frames prior to responding to the willingness to pay question. Subject 43 asked why the study was being done. He said he thought perhaps the government had cut back on the research funds and that they were going to ask for funds. He also wanted to know whether there was some medical treatment developed that would get rid of angina, but that had not been made public. Previous research has demonstrated that people respond differently to the two problem frames (Gregory, 1986; Knetsch and Sinden, 1984). An interesting question for further research is whether framing a problem as one of "compensation demanded" leads more people to anchor on the potential loss and adjust downward to reflect lack of certainty that it will happen. Framing a problem as willingness to pay may lead more people to edit the risk to zero.

There is another possible explanation for the zero/everything phenomenon. Subjects can be divided into "those who give very low values for willingness to pay to avoid extra angina because they feel that they should bear the

burden of the disease themselves and not bother others with it, and those who give very high values because they feel that they deserve to devote whatever resources are available to easing their burden" (Keller and Lambert, 1986). Ramshaw and Stanley (1984) found a similar pattern. They divided angina patients who had undergone CABG into two groups. People who had scored low on a neuroticism scale and coped well with previous stressful situations generally rated themselves as "well off" one year after their operation. In contrast, those who scored high on neuroticism and had not coped well with stress did not rate themselves as well off as the other group.

Future research on the zero/everything phenomenon will clarify the understanding of the way angina patients value improvements in their symptoms and may suggest alternative research paradigms for eliciting the information needed for making policy decisions about health risks resulting from environmental pollutants. The discussion here is purposefully speculative and is meant to stimulate further research rather than to imply that this study provides much evidence for testing the different hypotheses.

4.2.6 Analysis of Relationship of Open-Ended WTP Response with Other Responses

Regression analysis was used to identify relationships between responses to Question 33 and potential explanatory factors, including personal characteristics and survey instrument factors. Regression results obtained for Q33PAYM (dollar payment per month to prevent four or eight angina episodes) are reported in Table 4.2-10 (a and b). The variables are defined in Table 4.2-11 and means for the variables are given in Table 4.2-12. The two presented regressions differ in the use of either defensive expenditures

Table 4.2-10a. Regression analysis predicting willingness-to-pay dollar amounts from the open-ended WTP Question 33. Defensive expenditures are represented by DEFANG, the defensive expenditure per angina episode avoided

Regression Analysis

Equation 1

Dep Variable:
Q33PAYM

<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>MEAN SQUARE</u>	<u>F VALUE</u>	<u>PROB > F</u>
MODEL	9	2616023.65	290669.29450	3.544	0.0055
ERROR	26	2132581.91	82022.38096		
C TOTAL	35	4748605.56			
ROOT MSE		286.3955	R-SQUARE	0.5509	
DEP MEAN		208.8889	ADJ R-SQ	0.3954	
C.V.		137.1042			

Parameter Estimates

<u>VARIABLE</u>	<u>DF</u>	<u>PARAMETER ESTIMATE</u>	<u>STANDARD ERROR</u>	<u>T For H₀: PARAMETER = 0</u>	<u>PROB > T </u>
INTERCEP	1	-936.101	345.22521914	-2.712	0.0117
CHANG	1	42.49950139	28.60039065	1.486	0.1493
Q43HINCM	1	1.24954930	0.40493782	3.086	0.0048
MONFREQC	1	5.89451688	3.17960235	1.854	0.0751
SURG	1	246.54566498	118.32953508	2.084	0.0472
SURGANG	1	-12.2347	4.67304211	-2.618	0.0145
DEFANG	1	6.18485953	1.58929489	3.892	0.0006
PAY1	1	3.66830380	1.43707072	2.553	0.0169
COISELF	1	-0.000998279	0.002967415	-0.336	0.7393
Q31GMI	1	31.25966729	19.79188162	1.579	0.1263

Table 4.2-10b. Regression analysis predicting willingness-to-pay dollar amounts from the open-ended WTP Question 33. Defensive expenditures are represented by DEFCOST, the total annual defensive expenditure

Regression Analysis

Equation 2

Dep Variable:
Q33PAYM

<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>MEAN SQUARE</u>	<u>F VALUE</u>	<u>PROB > F</u>
MODEL	9	2617112.80	290790.31082	3.547	0.0054
ERROR	26	2131492.76	81980.49070		
C TOTAL	35	4748605.56			
ROOT MSE		286.3224	R-SQUARE	0.5511	
DEP MEAN		208.8889	ADJ R-SQ	0.3958	
C.V.		137.0692			

Parameter Estimates

<u>VARIABLE</u>	<u>DF</u>	<u>PARAMETER ESTIMATE</u>	<u>STANDARD ERROR</u>	<u>T For H₀: PARAMETER = 0</u>	<u>PROB > T </u>
INTERCEP	1	-764.436	334.75028533	-2.284	0.0308
CHANG	1	37.40540586	28.55545084	1.310	0.2017
Q43HINCM	1	1.07454138	0.39248825	2.738	0.0110
MONFREQC	1	4.39890900	3.12352005	1.408	0.1709
SURG	1	218.73022059	118.65061709	1.843	0.0767
SURGANG	1	-11.5897	4.67027184	-2.482	0.0199
DEFCOST	1	0.06746431	0.01732397	3.894	0.0006
PAY1	1	3.62645011	1.43755033	2.523	0.0181
COISELF	1	-0.000802583	0.002970846	-0.270	0.7892
Q31GMI	1	24.22031521	19.43102467	1.246	0.2237

Table 4.2-10c. Regression analysis predicting willingness-to-pay expressed as a percentage of monthly income (PAYINC)

Regression Analysis

Equation 3

Dep Variable:
PAYINC

<u>SOURCE</u>	<u>DF</u>	<u>SUM OF SQUARES</u>	<u>MEAN SQUARE</u>	<u>F VALUE</u>	<u>PROB > F</u>
MODEL	9	1.22093904	0.13565989	3.144	0.0107
ERROR	26	1.12178613	0.04314562		
C TOTAL	35	2.34272516			
ROOT MSE		0.2077152	R-SQUARE	0.5212	
DEP MEAN		0.1421593	ADJ R-SQ	0.3554	
C.V.		146.1144			

Parameter Estimates

<u>VARIABLE</u>	<u>DF</u>	<u>PARAMETER ESTIMATE</u>	<u>STANDARD ERROR</u>	<u>T For H₀: PARAMETER = 0</u>	<u>PROB > T </u>
INTERCEP	1	-0.400396	0.25038291	-1.599	0.1219
CHANG	1	0.0209298	0.02074312	1.009	0.3223
Q43HINCM	1	0.0002473776	0.0002936909	0.842	0.4073
MONFREQC	1	0.006316575	0.002306083	2.739	0.0110
SURG	1	0.14229324	0.08582135	1.658	0.1093
SURGANG	1	-0.00898299	0.003389236	-2.650	0.0135
DEFANG	1	0.003218624	0.0011526746	2.792	0.0097
PAY1	1	0.002298914	0.00104227	2.206	0.0364
COISELF	1	.00000358463	.00000215219	1.666	0.1078
Q31GMI	1	0.007541569	0.01435454	0.525	0.6038

Table 4.2-11. Definitions of Regression Variables

Q33PAYM	Responses to Question 33 with recodes to \$0 for Subject 16 and to \$100 for Subjects 62 and 106, in dollars per month to prevent an increase of four or eight angina episodes per month.
PAYINC	$Q33PAYM/(Q43HINCM/12)$: Willingness to pay to prevent an increase in angina as a percent of monthly household income.
CHANG	Change in angina posed to subject, either four or eight episodes per month.
Q43HINCM	Annual household income in \$100s, midpoint of range selected for Question 43.
MONFREQC	Current frequency of angina in episodes per month, adjusted from the 1-9 scale in Question 6 to number of episodes per month. Subjects who report no angina at present were coded as .01/month.
SURG	If subject has had bypass surgery, SURG = 1. Otherwise, SURG = 0.
SURGANG	$SURG * MONFREQC$: Current angina frequency for subjects who have had surgery, 0 for subjects who have not had surgery.
DEFANG	Defensive expenditure per angina episode avoided, based on Questions 20c, 20d, ALT-20b, and ALT-20c.
DEFCOST	Total annual defensive expenditures in dollars, based on Questions 20c, 20h, 20i, ALT-20b, and ALT-20g.
PAY1	The first dollar amount the subject was asked in Question 32.
COISELF	Annual income lost to subject in dollars due to angina, based on Questions 21, 21d, 21f, 21g, ALT-21, and ALT-21c, and medical expenses incurred by the subject in the past year.
Q31GMI	Rating given (on 1 to 10 scale) of the concern about increased risk of MI that the subject would feel if angina became more frequent.

Table 4.2-12. Summary of means and variances of variables used in the regression analyses

<u>Variable</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Minimum Value</u>	<u>Maximum Value</u>	<u>Std Error of Mean</u>
Q33PAYM	42	210.0000	351.2087	0.0000	2000.0000	54.1927
PAYINC	40	0.1637	0.2698	0.0000	1.2000	0.0427
CHANG	50	5.8400	2.0138	4.0000	8.0000	0.2848
Q43HINCM	47	220.2128	152.2154	25.0000	650.0000	22.2029
MONFREQC	50	15.4414	24.8640	0.0100	90.0000	3.5163
SURG	50	0.4600	0.5035	0.0000	1.0000	0.0712
SURGANG	50	6.6406	14.2633	0.0000	60.0000	2.0171
DEFANG	45	13.5157	30.2717	0.0000	140.0000	4.5126
DEFCOST	50	903.5800	2523.4981	0.0000	12780.0000	356.8765
PAY1	50	47.0000	36.1967	5.0000	100.0000	5.1190
COISELF	50	9833.0	18258.0	0.0	65374.0	2582.5
Q31GMI	50	7.120	3.114	1.0	10.0	0.440

per angina episode avoided (DEFANG), or total annual defensive expenditures (DEFCOST) as the independent variables. The adjusted R-squared statistics indicate that about 40 percent of the variation in Q33PAYM is explained by the independent variables in each of these regressions. This is reasonably good for a small sample of cross-sectional information (the best adjusted R-squared obtained by Rowe and Chestnut (1986) in a similar analysis was .25). Some alternative specifications that were rejected in favor of these two regression models are discussed below.

One additional regression is reported in Table 4.2-10c. The dependent variable is PAYINC, the willingness to pay as a percent of monthly income. This dependent variable was defined because several of the subjects said that they would pay as much as they could afford to prevent any additional angina. Therefore, it seemed that their responses might be appropriately characterized in relation to their incomes. The explanatory power of the independent variables is, in general, very similar for the PAYINC regression.

The regression results are discussed below in terms of the effects of the independent variables on the willingness to pay measures.

Change in Angina Episodes (CHANG)

One important result of the regression analyses, with implications for future instrument design, is that the CHANG coefficient is positive, as expected, but is not statistically significant (Table 4.2-10a-c). This is consistent with the finding that the means of Q33PAYM for four and eight episodes are not significantly different, suggesting that subjects did not find four and eight episodes per month sufficiently distinct.

Two alternative measures of change in angina frequency were considered. One possibility considered whether it was the change relative to the current level that was important, but variables defined as 1) percentage change from current angina frequency, and 2) as the ratio of current angina frequency to proposed new level, were also insignificant relative to Q33PAYM. Another possibility considered in the analyses was a constant elasticity of WTP with respect to changes in angina frequency. This would result in a declining value per additional episode prevented, so that a constant total WTP would be observed and WTP would appear to be unrelated to the number of episodes. If this were the case, Q33PAYM/CHANG could be expected to be negatively related to CHANG. This relationship was, however, found to be insignificant.

These results suggest that asking some subjects about four episodes and some about eight episodes per month was not sufficient to determine how WTP could be expected to change as a function of the size of the change in angina. This may be due to four and eight episodes being quite similar relative to the current range in angina frequency among the subjects: 0 to 90 or more episodes per month. A recommendation for subsequent instrument design is that each subject be asked about more than one size change, and/or that the change in angina posed to the subject be treated as a percentage change from current frequency or tied in some other way to the current level.

Income (Q43HINCM)

Annual household income was found to be positively related to Q33PAYM ($p = .005$ in Equation 1 and $p = .011$ in Equation 2). This is a stronger relationship than is found in similar WTP estimates and may reflect the feeling expressed by many of the subjects that they would pay whatever they

could afford to prevent additional angina episodes. The implied income elasticity (the percent change in WTP for a one percent change in income) at the variable means is 1.3 for Equation 1 and 1.1 for Equation 2.

The results in Table 4.2-10c indicate that income is not related to PAYINC. This means that subjects with higher household incomes were not giving WTP responses that reflected a higher percentage of income, as might have been expected.

Current Angina Frequency and Disease History

It was expected that heart condition at the time of interview and medical history would influence WTP. Four variables were used to describe heart health. MONFREQC is the average number of angina episodes the subjects reported as currently experiencing each month. Seven of the 50 subjects reported having no angina at present, although they had previously had angina attacks. For these subjects MONFREQC was given a value of .01. It was expected that MONFREQC would be insufficient to fully characterize the subject's experience with heart problems because it does not take into account how ill the subject might have been previously. Therefore, a variable for whether the subject had had bypass surgery (SURG), an interaction term of angina and surgery (SURGANG = $\text{MONFREQC} * \text{SURG}$), and the number of heart attacks the person had had (NUMMI) were also used. NUMMI was dropped because the estimated coefficient was insignificant in all specifications.

The estimated coefficient for MONFREQC was positive, as expected, and was statistically significant ($p < .10$) in Equations 1 and 3. It was expected that subjects who had had surgery might be more concerned about preventing an increase in angina. The coefficient for SURG was positive and significant ($p < .10$) in most of the specifications.

The coefficient for SURGANG was negative and significant ($p < .05$) in all the specifications. The expected sign for SURGANG was negative because the difference between subjects who had and had not had surgery was expected to be greatest for those with the lower levels of current angina frequency. Thus, a subject who had surgery and was now experiencing low current angina would be expected to respond to the WTP question more like a person who was currently experiencing more frequent angina. Moreover, they have just paid a significant amount (if not in money then in personal energy) related to having surgery to reduce angina. However, a person who had surgery but now had many angina episodes would have a larger decrease in WTP relative to others, perhaps because of an attitude that the angina could not be made better. An alternative approach might use levels of angina experienced previous to treatment, surgery, or lifestyle change. This information was not obtained, but should be considered in future instrument design.

To show the combined effects of the coefficients for MONFREQC, SURG and SURGANG, derivatives were calculated for Q33PAYM and PAYINC with respect to MONFREQC and SURG for Equations 1 and 3. These are shown in Table 4.2-13. For subjects who had not had bypass surgery, the derivative of Q33PAYM with respect to MONFREQC was 5.9. This means that for subjects who had not had bypass surgery, every additional episode per month in terms of current angina frequency was associated with a \$5.90 increase in Q33PAYM. For subjects who had surgery, the derivative was -6.3. That this is negative means a subject who had surgery and low angina would have been willing to pay more to prevent an increase in angina than a subject who had surgery and high angina frequency. This latter group might be more inclined to feel that a change of four or eight episodes was not significant, and that the increase is inevitable.

Table 4.2-13. Derivatives of WTP with respect to MONFREQC and SURG

MONFREQC	
<u>Equation 1</u>	
$\frac{\delta Q33PAYM}{\delta MONFREQC} = 5.9 - 12.2 * SURG$	
For SURG = 0:	$\frac{\delta Q33PAYM}{\delta MONFREQC} = 5.9$
For SURG = 1:	$\frac{\delta Q33PAYM}{\delta MONFREQC} = -6.3$
<u>Equation 3</u>	
$\frac{\delta PAYINC}{\delta MONFREQC} = .0063 - .0090 * SURG$	
For SURG = 0:	$\frac{\delta PAYINC}{\delta MONFREQC} = .0063$
For SURG = 1:	$\frac{\delta PAYINC}{\delta MONFREQC} = -.0033$
SURG	
<u>Equation 1</u>	
$\frac{\delta Q33PAYM}{\delta SURG} = 246.5 - 12.2 * MONFREQC$	
Shifts from positive to negative at MONFREQC = 20	
<u>Equation 3</u>	
$\frac{\delta PAYINC}{\delta SURG} = .14 - .0090 * MONFREQC$	
Shifts from positive to negative at MONFREQC = 16	

The derivatives of the WTP measures with respect to SURG are positive over the lower range of angina frequencies, indicating that for these subjects WTP was higher if the individual had had bypass surgery. At high frequencies of angina (20 per month in Equation 1 and 16 per month in Equation 3), this derivative becomes negative, indicating that WTP was lower for subjects who had had bypass surgery.

These findings generally confirm the expectation that subjects who have more severe heart conditions are willing to pay more to prevent that condition from becoming worse, but they also illustrate the complexity involved in characterizing an individual's condition. The findings are also consistent with the comments offered by some subjects that a change in angina of four or eight episodes per month would not have been that important to them, and that it was their overall condition that concerned them. It appears this kind of response is more likely to be obtained from subjects who have had surgery and still experience a high frequency of angina; in other words, subjects who, by these measures have the most severe conditions.

Defensive Expenditures (DEFANG AND DEFCOST)

Estimates of defensive expenditures incurred by each subject were positively and significantly ($p < .01$) related to WTP in each of the specifications. In Equation 1, the coefficient for DEFANG was about 6, indicating that for every dollar increase in the amount the subject was currently spending to prevent an additional angina episode (DEFANG), WTP to prevent four or eight additional episodes increased by \$6.00. Since the average number (across all subjects) of additional episodes hypothesized was 5.8, the DEFANG coefficient implies nearly a one-to-one relationship between

what the subject was currently spending to prevent an angina episode and what he said he would be willing to spend to prevent an additional episode. This is strong support for the hypothesis that the subjects were giving responses to Question 33 that were consistent with their circumstances.

The coefficient for DEFCOST was also positive and significant. DEFCOST was the total annual defensive expenditure incurred regardless of the number of episodes reduced. This coefficient indicated that subjects who were spending more were willing to pay more to prevent additional episodes. One possible factor that may contribute to these findings is that subjects who said they were incurring expenses to prevent angina may have been more willing to consider the idea presented in Question 33 (that a payment might be related to angina frequency) and might therefore have given higher dollar responses.

Income Lost and Out-of-Pocket Medical Expenses Due to Angina

The coefficient for COISELF was not significant in the Q33PAYM equations, but was positive and marginally significant ($p = .11$) in the PAYINC equations. This suggests that subjects with more lost income and out-of-pocket medical expenses due to angina were willing to pay a higher percentage of their current monthly incomes to prevent an increase in angina.

Survey Instrument Influences

It was hypothesized that the dollar amounts the subjects were asked in the close-ended willingness-to-pay Question 32 might influence their responses to the open-ended Question 33. This was supported by the finding of a significant ($p < .05$) coefficient for the first dollar amount asked of the

subject (PAY1) in every specification. The size of the coefficient in the Q33PAYM equations was about 4, indicating that for every dollar increase in the first amount asked in Question 32, the response to Question 33 increased by about \$4. This is evidence of a strong starting point anchoring bias.

Other specifications of the effects of Question 32 were also tested. The third amount asked and the difference between the first and second amounts were also positively related to responses to Question 33, but the statistical significance was not quite as strong as for PAY1. These measures were all correlated to some extent and may therefore be reflected in the PAY1 coefficient. In other words, a higher value for PAY1 means that there was often a larger increment between the first and second amounts in addition to the first amount being higher.

The order of the questions concerning one angina episode (Question 30, which was moved to follow Question 33 part way through the interviews) was not found to be significantly related to the non-infinite responses to Question 33.

The finding of a strong starting point bias from Question 32 poses a problem for future instrument design. Preliminary interviews suggested that the subjects would have a hard time answering an open-ended WTP question due to difficulty with the concept of trading dollars for health and to a lack of experience with deciding how much they would be willing to pay. Therefore, Question 32 was added to obtain some information about WTP in case Question 33 received too many refusals and to get the subjects thinking about how much it would be worth to prevent additional angina. This seemed to be helpful in preparing them to answer Question 33, but it apparently also influenced their answers. Future efforts may need to continue to use some preliminary questions before subjects will be ready to answer an open-ended WTP question,

but potential effects of these preliminary questions should be thoroughly considered in the analysis. For example, yea saying to the first dollar amount in closed-ended referendum bidding questions may occur, resulting in a bias similar to the starting bid bias in an interactive bidding approach. Some evidence of this behavior was found in this application, but the sample sizes were too small to address the concern.

Concern About Heart Attacks

The rating given by the subject regarding concern about heart attacks or bypass surgery if angina were to increase, Q31GMI, also was included in the regression. The estimated coefficient was consistently positive, but not statistically significant.

This issue should be further explored in future research efforts. It was apparent from responses to several questions that for many of the subjects concern about temporary or permanent heart damage was associated with angina symptoms. A variable such as Q31GMI might be statistically significant in a larger sample. In response to Question 37, 18 out of the 50 subjects said they thought some heart damage was associated with angina pain. When subjects were asked about help hired to reduce risks of angina, 19 out of 20 subjects responding to this question said they thought their risk of heart attack would be higher if they did this work themselves. This all suggests that for some subjects, concern about heart attacks may be reflected in responses to WTP for changes in angina frequency. To the extent that perceived changes in welfare are to be considered, this inclusion may be valid whether or not it is medically correct.

4.3 Averting Behaviors

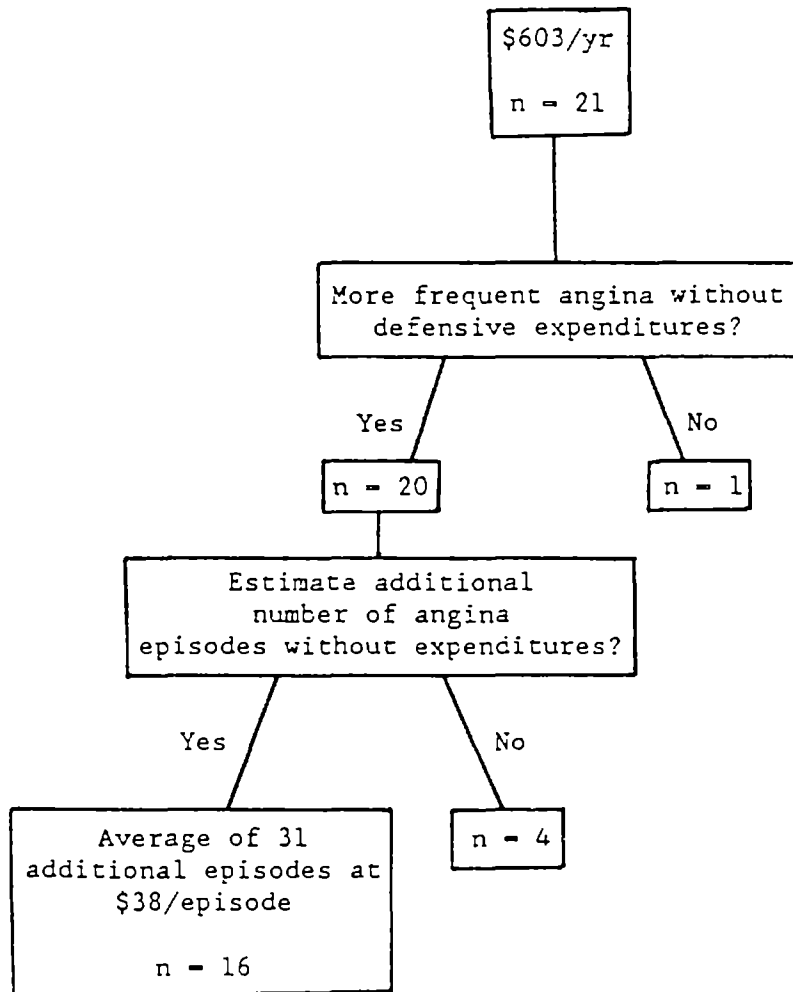
In Questions 20 and ALT-20, subjects were asked about non-medical expenditures they had made in the past year to reduce or prevent potential angina symptoms. The most common expenditures were for hiring help with yard work and car maintenance that would otherwise have been done by the subjects themselves. Goods purchased to prevent additional angina included lawn mowers, household appliances and new automobiles (to ensure reliable transportation and reduce maintenance work).

The 21 subjects with these expenditures were asked to estimate their annual costs for the help they most often hired. The results are summarized in Figure 4.3-1. Including answers to Questions 20c and ALT-20b only, the average annual expense for this item was \$603 (Figure 4.3-1). Other defensive expenditures in Questions 20h and 20i were not included. Twenty of the subjects with these expenses said that they believed they would have experienced more frequent angina if they had not incurred this expense, and sixteen of them were able to give an estimate of the additional episodes they might have had. The average estimate was 31 additional episodes in a year. With this estimate it was possible to calculate an estimate of the expenditure per angina episode avoided for these 16 subjects. The average expenditure per angina episode was \$38, with a minimum of \$3.50 and a maximum of \$140.

It is interesting to note that the average willingness to pay given in response to Question 33 for this group was \$28 per angina episode avoided (with two of the 16 subjects giving very high values). That these subjects were actually spending a similar amount per episode avoided supports the credibility of the WTP estimates. This comparison is not exact, however, because these two dollar measures do not necessarily reflect exactly the same

Figure 4.3-1

Average Averting Expenditures
(Single Expense Listings)



Note: Including multiple expense listings for the group of 21, average averting expenditures were \$2,151 per year (n = 21).

thing. Even though we asked subjects to list services that they would not purchase if they did not have angina, there may be some joint benefit to the subject from the purchase (for example, angina is avoided and time is freed from mowing the lawn). Also, the subject's ability to reduce risks of angina is probably not reflected by a smooth or continuous production function. The individual may be forced to choose between purchasing too little or too much relative to the actual utility optimizing amount.

Fourteen of the 21 subjects with some expenses gave more than one example. With information provided by the subjects, and estimates of typical costs of services, an estimate of total annual defensive expenditures for each of the fourteen subjects was developed. Answers to Questions 20c, 20h, 20i, ALT-20b and ALT-20g were used along with the following estimates of costs:

<u>Activity Category</u>	<u>Cost per Event</u>
meal preparation	\$15
indoor cleaning	30
outdoor cleaning	25
indoor repairs	75
outdoor repairs	150
appliance repair	40
car maintenance	40
meals at restaurants	15

For the 21 subjects with some defensive expenditures, the average annual total expense was estimated to be \$2,151, ranging from \$84 to \$12,780.

Given the existence of significant defensive activity on the part of the angina subjects, it is of interest to explore the decision to mitigate or avert the potential adverse health effects. Therefore, the following will identify characteristics that determine whether an individual will undertake defensive behavior, examine the factors that may explain the actual level of defensive spending, and finally examine the relationship between defensive activity and exposure to CO.

Factors Influencing Defensive Spending

Defensive behavior was indicated by a positive response to survey questions about hiring help for yard work, home, or auto maintenance, or for purchasing special equipment. These purchases would reduce physical exertion which has been linked to the aggravation of angina. It was hypothesized that the decision to undertake a defensive expenditure would depend on several factors, including ability to pay, attitude towards risk, previous health habits and awareness, severity of angina, age, and household size. The latter could involve two opposite effects. First, it might be expected that in bigger households, there would be less need to hire outside help since household members can share the responsibilities for yard and repair work. Conversely, in larger households there may be more direct and implicit pressure for the individual with a heart condition to take better care of himself. Also, if the household includes younger children, there may be more demands on the subject.

This hypothesis was explored using both a linear probability model in ordinary least squares regression and a logistic model. A binary variable was created which indicated whether a subject identified himself as having had defensive expenses. With the linear probability model, a forward stepwise procedure was used to select from among a large number of candidate explanatory variables. Variables selected at the 0.500 significance level of entry were used to specify a logistic model. Since the logistic model generated results similar to the linear probability model, only the linear probability model is described in full in this text. The results of the least squares regression are displayed in Table 4.3-1.

Table 4.3-1. Regression analysis predicting the probability of defensive action

	<u>B</u>	<u>S.E.</u>	<u>p value</u>
Intercept	-.25	(.027)	.03
Income	-.062	(.027)	.03
Maximum Severity of Angina	.143	(.043)	.002
Doctor Visits for Angina	.013	(.017)	.47
Household Size	.064	(.051)	.22
Age	.015	(.008)	.08
Pack Years (thousand)	-.013	(.005)	.01
Near Smoker (Q S17)	-.166	(.122)	.18
Belief (Q 37)	-.116	(.078)	.15
$R^2 = .51$			
N = 41			

Note: Income is a categorical variable (see Question 21g). Maximum severity is the highest severity recorded in response to inquiry about seasonal differences in severity (Question 7).

The regression model, which explained 51 percent of the variability of the decision to undertake defensive action, suggests that this decision is related to factors that reflect current health status (greater angina severity, angina-related doctor visits), health concern and awareness (belief that angina attacks will harm the heart, rarely near smokers), past health habits (fewer pack years of smoking), demographics (age and household size), and lower household income. All of the coefficients were plausibly signed except income.

The regression results indicated that for the sample of 41 subjects for which the data were complete, the probability of a defensive action was positively associated with greater severity of angina attacks during the previous year, age of the subject, greater number of angina-related doctor visits, and larger household size. Of the positive associations, only the variable representing maximum severity was statistically significant ($p = .002$). However, age, one of the positive terms related to severity of disease and health concern, approached statistical significance ($p = .08$). The regression indicates that for a 10-year increase in age, the probability of a defensive action increases 15 percent.

A higher probability of defensive action was inversely associated with pack years of cigarette smoking, frequency with which subjects were around smokers, household income, and greater belief that the heart is harmed by angina episodes. Of these variables with negative associations, pack years ($p = .01$) and income ($p = .03$) were statistically significant. The inverse association of pack years and defensive action suggests that individuals who exhibit averted behavior have smoked less over their lifetime and demonstrate a greater aversion to risk.

The inverse association of income and defensive action was an unexpected result since it indicated that those with higher incomes were less likely to have defensive actions. This association may be partly explained by the slight correlation ($r = .29$; $p = .12$) between income and bypass surgery (thus mitigating the need for further defensive actions); by the current health status of those who had a higher income and who were therefore more likely to be healthier and employed; or by the phrasing of the defensive expenditure question. Subjects with higher incomes are more likely to hire help with yardwork anyway and may therefore be less likely to attribute this expenditure to concern about angina.

Next, the factors that determined the amount of defensive expenditures were analyzed for the group of subjects reporting such expenditures ($n = 21$). Theoretically, the demand for defensive expenditures is expected to be related to income, the price of the potential purchase, the number of angina episodes that can be reduced by the purchase, the severity of the current angina condition, risk perception, and demographic factors such as age and household size. As a pilot analysis with a small sample, an ordinary least squares stepwise regression procedure was used to determine how these variables would affect expenditures (Table 4.3-2). Because of the small sample size, the number of independent variables was limited to four. Both household income and personal income were tested, while price was assumed constant through the one-year period. Variables were included to represent the number of episodes that were perceived to be reduced, heart attack history, the number of angina-related doctor visits in the last year, the perception of whether an angina episode added damage to the heart, the perception of the additional heart attack risk if an individual did not undertake the defensive action, age, and the number of people in the

Table 4.3-2. Regression analysis predicting the amount of defensive expenditures

	<u>B</u>	<u>S.E.</u>	<u>p value</u>
Constant	-22947		
Household Size	3035	(812)	.003
Age	271	(125)	.05
Angave	35.8	(36.3)	.34
Episaved	0.66	(3.24)	.84
$R^2 = .40$			
N = 21			

Note: Angave is the average frequency of angina based on Question 6.
 Episaved is the total number of angina episodes saved by defensive expenditures.

household. Unfortunately, since the sample size was so small, these results only indicate the explanatory variables that were most associated with higher defensive cost.

The results of the stepwise regression indicate that age and household size were highly associated with the level of defensive expenditures. Both were significant statistically, and together explained 40 percent of the variation in expenditures. The significance of household size may indicate changes in lifestyles, or that the members of the household, usually family members, may exert a protective influence on the heart patient. Age may be related to perceived risk or severity. Neither the "average" level of angina frequency (average of Question 6 across seasons) nor the number of angina episodes that would be reduced were statistically associated with expenditures. Thus, the number of angina episodes currently experienced demonstrates an insensitivity to the costs associated with defensive expenditures. This result was reinforced during other regression analyses. When attempting to explain defensive expenditures per episode reduced, or the "price of an episode," an F-test was never significant.

Averting Behavior and CO Exposure

Since 18 of the 50 subjects had participated in earlier exposure monitoring research, we next examined the relationship between averting behavior and CO exposure. The level of subjects' exposure to CO was examined using the arithmetic average of personal exposure monitor readings over a 2-5 day monitoring period (see Section 4.4). The small sample size limits the inferences that can be made about these results.

We expected that the actual exposure would depend on current health status, attitude about the harmfulness of pollution, expressed desire to reduce pollution exposure, attitudes towards risk, voluntary contact with CO sources (e.g., amount of driving, proximity to gasoline-powered engines on the job or at home), smoking status, socioeconomic factors, and degree to which other defensive action was undertaken. Several variables were also included that would represent indoor exposures to CO since current research indicates that it is an important determinant of total CO exposure. Thus, variables indicating the use of a kitchen exhaust fan or opening of windows for ventilation and home insulation practices, were included among the candidate variables for selection. Again, an ordinary least squares stepwise regression procedure was used to observe the priority of entry into the model of the explanatory variables. The first three variables selected into the model (Table 4.3-3) were 1) whether the individual felt angina pain when walking at an ordinary pace on level ground; 2) whether the individual indicated that air pollution aggravated their angina; and 3) whether the individual was currently smoking.

Since personal tobacco use is a significant source of CO, the inclusion of smoking status was a reassuring result. Of particular interest, however, was the selection into the model of two variables which indicate possible averting behavior. If the angina subject gets an attack without too much strain, such as level walking, it suggests that he probably would do less walking and generally be outside less. Thus, exposure may be lessened if subjects do not walk on city streets or perform exertional activities such as using a gasoline-powered lawn mower. Conversely, increased reliance upon the automobile for transportation could increase CO exposure. The implications for exposure are therefore uncertain. The third variable, indicating that the

Table 4.3-3. Regression analysis predicting average carbon monoxide exposure

	<u>B</u>	<u>S.E.</u>	<u>p value</u>
Intercept	6.72		
WLKLEV3	-2.86	0.79	.003
SMOKE46	3.75	1.60	.03
POLL18	-1.07	.66	.13
$R^2 = .69$			
N = 18			

WLKLEV3 = pain from angina when walking on level ground (Yes = 1; No = 0)

SMOKE46 = current smoker (Yes = 1; No = 0)

POLL18 = 1 if yes to Question 18; otherwise = 0 - does air pollution bother your angina

subject feels his condition is aggravated by air pollution also may indicate less time outside and less active behavior. However, due to the small sample size and modest significance level, these results can only be viewed as suggestive.

These results, taken together, appear to indicate that behavior aimed at reducing the risks relating to exposure to CO was consistent with other choices made about health care and status by the subjects. For example, those with more severe angina were more likely to engage in defensive actions. They were more likely to hire household help and purchase equipment to reduce further risks of angina, and were likely to have reduced exposure to CO. Those who appeared to have greater concern for health or who were more risk averse, such as those who believed angina would increase heart attack risk and those who had smoked less in the past, were also more likely to undertake defensive behavior. Also of interest was the role household size appeared to play on health. Subjects from a larger household were more likely to hire help and purchase defensive equipment, and, among all those who had defensive expenditures, spent more. Although the analysis is limited by small sample size, it does suggest that defensive action may be an important aspect of health care and an important determinant of pollution exposure.

4.4 Community CO Exposures of IHD Subjects

Activity Patterns

In the sample of IHD subjects followed in the UC Irvine study, time spent in indoor residential microenvironments dominated the time-weighted classification of daily activities (Figure 4.4-1, Tables 4.4-1 and 4.4-2).

Figure 4.4-1. Proportion of time spent in major microenvironmental classes for nonsmoking IHD subjects while wearing the CO personal exposure monitors

PROPORTION OF TIME SPENT IN VARIOUS MICROENVIRONMENTS

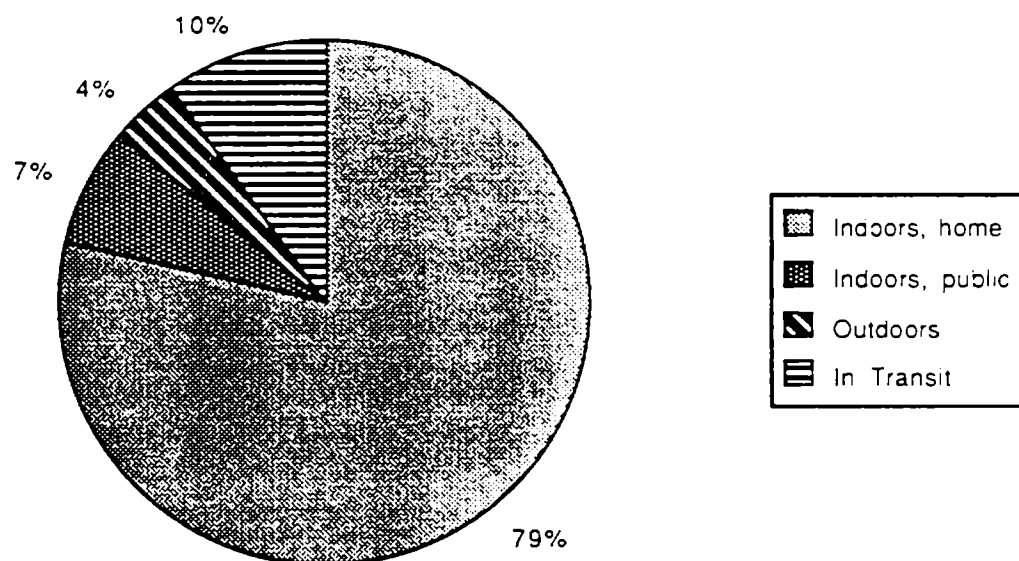


TABLE 4.4 -1. Ranking of time-weighted exposures by activity class. Occupancy time refers to the time engaged in specific activity in a 24-hour period

RANK	ACTIVITY	CODE	TIME-WEIGHTED CO EXPOSURE (ppm-min)	GEOMETRIC MEAN OCCUPANCY TIME (min)	GEOMETRIC MEAN CO CONCENTRATION (ppm)
1	Night sleep	45	825.6	471.0	1.8
2	Television viewing	91	245.4	91.5	2.7
3	Travel related to goods and services	39	244.1	39.7	6.1
4	Meals, snacks at home	43	130.4	47.5	2.7
5	Personal hygiene	40	91.7	38.4	2.4
6	Monitor attachment	38	81.5	27.8	2.9
7	Relaxing, thinking, doing nothing	98	80.7	29.5	2.7
8	Taking a walk	82	29.0	10.5	2.8
9	Resting	47	26.5	8.6	3.1
10	Reading books	93	21.7	7.3	3.0
11	Travel related to social activities	79	21.1	3.4	6.2
12	Preparing food	10	20.1	7.3	2.8
13	Travel to and from work	09	17.4	2.9	6.0
14	Meals at restaurant	44	16.0	3.9	4.1
15	Marketing	30	15.3	3.3	4.7
16	Reading newspapers	95	14.3	4.7	3.0
17	Other household duties	19	14.2	4.4	3.2
18	Civic participation	62	14.0	1.2	12.2
19	Visiting with friends	75	13.2	4.3	3.1
20	Regular work	00	13.1	4.5	2.9
21	Gardening, animal care	17	13.0	3.6	3.7
22	Waiting for goods or services	36	13.0	2.0	6.4
23	Travel related to personal care	49	11.2	2.6	4.4
24	Active sports	80	11.0	3.6	3.1
25	Travel related to organizational activity	69	10.8	1.8	5.8
26	Parties, receptions, picnics	76	10.2	1.5	6.8
27	Shopping for durable household goods	31	9.8	2.7	3.6
28	Social activity at cafe or bar	77	9.3	1.1	8.8
29	Personal care	32	8.5	1.1	7.5
30	Medical care	33	8.4	2.5	3.3
31	Other household upkeep and repairs	16	8.0	2.4	3.3
32	Travel related to study or school	59	7.9	1.1	7.4
33	Work (for pay) at home	01	7.8	1.8	4.4
34	Repair services	35	7.5	1.2	6.2
35	Travel related to active leisure	89	7.5	1.7	4.4

TABLE 4.4-1 Con't.

RANK	ACTIVITY	CODE	TIME-WEIGHTED CO EXPOSURE (ppm·min)	GEOMETRIC MEAN OCCUPANCY TIME (min)	GEOMETRIC MEAN CO CONCENTRATION (ppm)
36	Clothes care	15	7.3	1.1	6.5
37	Conversations	96	7.2	2.4	3.0
38	Travel with child	29	6.9	1.2	5.7
39	Outdoor chores	13	6.8	2.9	2.3
40	Meal cleanup, doing dishes	11	6.4	1.3	4.9
41	Obtaining other services	37	6.3	1.1	5.8
42	Religious activities	64	5.9	1.2	4.8
43	Travel related to passive leisure	99	5.8	1.2	5.0
44	Daytime sleep	46	5.8	1.2	4.8
45	House cleaning	12	5.4	2.1	2.5
46	Work breaks	08	5.1	1.3	4.0
47	Child care	21	4.9	1.1	4.3
48	Other classes or courses	51	4.9	1.2	4.0
49	Waiting, delays at work	04	4.6	1.1	4.3
50	Volunteer activities	63	4.3	1.6	2.7
51	Hobbies	83	4.4	1.2	3.8
52	Reading or writing letters	97	4.1	1.3	3.2
53	Playing records or tapes	92	4.1	1.1	3.7
54	Travel for job	03	4.0	1.3	3.2
55	Government or financial services	34	3.9	1.7	2.2
56	Parlor games	87	3.8	1.6	2.4
57	Meals at work	06	3.8	1.3	2.9
58	Household activities related to heat or water	18	3.0	1.2	2.5
59	Radio listening	90	2.9	1.3	2.3
60	Religious practice	65	2.9	1.2	2.3
61	Personal medical care	41	2.4	1.2	2.0
62	Making music	86	2.1	1.2	1.8
63	Reading magazines	94	1.8	1.3	1.4
64	Private activity	48	1.6	1.2	1.3
65	Outdoor playing with children	25	1.5	1.2	1.4
66	Other active leisure	88	1.4	1.1	1.3
67	Laundry, ironing of clothing	14	1.4	1.2	1.2
68	Fishing, hiking	81	1.3	1.1	1.2
69	Entertainment events	71	1.3	1.1	1.2
70	Sports events	70	1.1	1.1	1.0

TABLE 4.4-2 Ranking of time- weighed exposures by microenvironment class. Occupancy time refers to time spent in location class.

RANK	MICROENVIRONMENT	CODE	TIME-WEIGHTED CO EXPOSURE (ppm-min)	GEOMETRIC MEAN OCCUPANCY TIME (min)	GEOMETRIC MEAN CO CONCENTRATION (ppm)
1	Bedroom	115	786.8	436.8	1.8
2	Personal Auto	310	357.2	63.8	5.6
3	Living Room	114	242.0	87.6	2.8
4	Kitchen	112	59.7	20.6	2.9
5	Indoors, home, unspecified	110	60.9	20.1	3.0
6	Bathroom	116	56.7	26.1	2.2
7	Hospital (includes monitor attachment)	138	56.5	18.2	3.1
8	Outdoors, around the house ¹	210	45.7	14.9	3.1
9	Store, post office, barbershop	132	27.9	6.4	4.4
10	Dining room area	113	25.2	8.7	2.9
11	Restaurant	131	17.8	4.2	4.3
12	Family room, den	111	15.8	5.4	2.9
13	Truck	311	12.9	1.7	7.7
14	Occupational Health Center Van	317	12.8	1.4	9.3
15	Meeting hall, lodge, clubhouse	147	10.8	2.9	3.7
16	Indoor gymnasium or swimming facility	142	10.2	1.2	8.3
17	Within 10 yards of active roadway	212	9.7	3.2	3.0
18	Work area (assemblyline, shop, warehouse)	122	9.1	2.7	3.3
19	Shopping mall	133	8.9	2.0	4.4
20	Outdoors, service station or motor vehicle repair facility	214	8.0	1.3	6.1
21	Parking lot or carport (open car building)	213	7.7	1.5	5.1
22	Indoors, service station or other motor vehicle repair facility	144	7.6	1.1	7.0
23	Indoors at home of friend	146	7.6	2.4	3.2
24	Indoors, unspecified	100	7.2	1.2	6.2
25	Garage or enclosed carport	118	6.5	2.4	2.8
26	Motor home	318	6.1	1.2	5.2

¹Yard, patio, outside house, within building areas but not in own unit.

TABLE 4.4-2 Con't.

RANK	MICROENVIRONMENT	CODE	TIME-WEIGHTED CO EXPOSURE (ppm-min)	GEOMETRIC MEAN OCCUPANCY TIME (min)	GEOMETRIC MEAN CO CONCENTRATION (ppm)
27	Indoors, home, other room	119	6.0	1.0	5.7
28	Bus	312	5.8	1.1	5.1
29	Motorcycle	313	5.4	1.1	4.9
30	Church	135	5.4	1.6	3.5
31	Neighborhood residential streets	211	5.3	3.6	2.3
32	School	136	5.1	1.3	4.1
33	Park, golf course, outdoor recreation area, beach	215	5.0	1.6	3.2
34	Lunchroom, breakroom	123	5.0	1.2	4.3
35	Office, public place	134	4.6	1.8	2.6
36	Bowling alley	141	4.6	1.1	4.1
37	Outdoor store, lumber yard, nursery	220	4.2	1.1	4.0
38	Walking	314	4.2	1.1	3.7
39	Office, work area	121	4.2	1.6	2.6
40	Indoors, public place, unspecified	130	3.7	1.1	3.4
41	Outdoors, walking	230	3.4	1.3	2.6
42	Home laundry room, workshop, utility room	117	3.3	1.4	2.3
43	Jogging or brisk walk for exercise	316	2.9	1.1	2.6
44	Bicycle	315	2.9	1.3	2.2
45	Outdoors, truck yard	231	2.8	1.2	2.3
46	Hotel/motel room	148	2.7	1.3	2.0
47	Diesel truck	319	2.6	1.2	2.2
48	Bicycle path	219	1.9	1.2	1.5
49	Outdoors, unspecified	200	1.4	1.0	1.3
50	Dance hall	140	1.3	1.1	1.2
51	Indoors, work, unspecified	120	1.2	1.1	1.1
52	Library	149	1.1	1.0	1.0

The subjects spent 79 percent of their monitoring day in their residence. Night sleep and bedroom were the single largest duration activity and microenvironment location occupied each day. Television viewing and other passive leisure activities largely took place in the living room or family room. Resting and relaxing activities were generally associated with the indoor residential environment. Time in personal auto accounted for most of the 10 percent of daily time spent in transit microenvironments. Generally, these values are comparable to those published for the general population (Chapin, 1974; Robinson, 1977; Ziskind et al. 1982). Daily time devoted to walking for exercise (10.5 minutes) and active sports (3.5 minutes) is substantially less than the 90 minutes national average for all age classes combined (Chapin, 1974).

Time activity patterns have important implications for myocardial oxygen demand. Several classes of activity are associated with very high myocardial oxygen demands. These include regular work at a job site or at home; outdoor chores at home; lifting work at home such as carrying firewood or moving furniture; exercise and outdoor recreation; sexual activity; and travel such as bicycling or walking, and driving in stressful situations. However, in the IHD subpopulation sampled, the occurrence of these strenuous activities was relatively infrequent, not only in terms of the number of occurrences but also in terms of the number of subjects choosing to engage in such activities. As indicated by the low geometric means, sustained intervals of heavy activity were uncommon across the aggregate. Yet certain subjects who were inclined to do heavy work did undertake such activity on a regular routine and, at times, maintained high levels of exertion for periods as long as two hours. Interviews revealed that though these subjects were prone to exertional angina, they were able to undertake heavy activity if they paced themselves.

These activities included heavy carpentry, auto repair, and cutting firewood. During the intervals, very high levels of exertion were achieved.

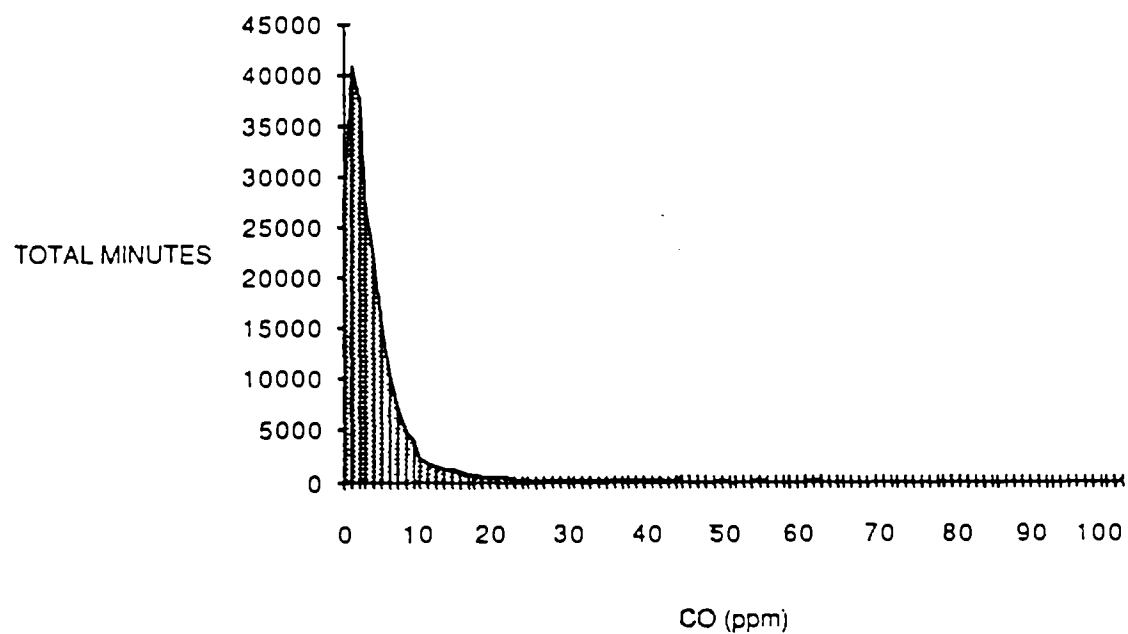
Walking for exercise represents the upper level of daily exertion for the majority of the IHD subjects studied in this effort (98 separate occurrences by 25 unique subjects). For most subjects it is a walk at a pace that is just slightly below their personal threshold of angina. It was not unusual for angina symptoms to be reported during walking exercise. During separate graded exercise testing on a treadmill using a modified Naughton protocol, the majority of the subjects identified a workload of 3-4 METs (i.e., 3-4 times the resting metabolic rate) as subjectively equivalent to their personal level of perceived exertion during walking. Thus, a low functional capacity was characteristic of this IHD group selected for study.

Community CO Exposure

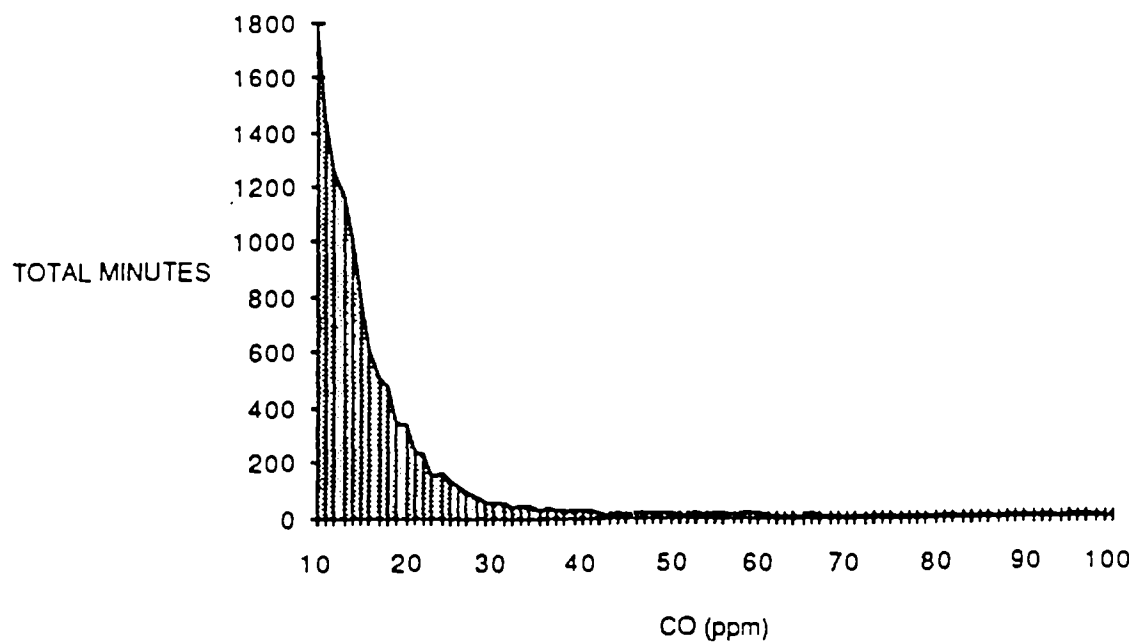
The highest CO exposures occurred during commuting and when near internal combustion engines. Average personal exposures were elevated during city street and freeway driving, and while in parking lots and automobile service stations (Tables 4.4-1 and 4.4-2). In contrast, residential exposures were generally low, allowing CO absorbed by the body while at other locations to wash out of the blood during the time spent at home. High short-term exposures were found in proximity to small gas-powered garden equipment. Transient peaks as high as 134 ppm were observed with use of a chain saw and 226 ppm with use of a lawn edger. Occupational exposures were highly variable with elevated exposures associated with warehouses, assembly lines, and garages. Generally, CO exposures remained below the federal standards of 35 ppm for 1-hour and 9 ppm over 8-hours (Figure 4.4-2).

Figure 4.4-2. Distribution of minute-by-minute personal CO exposure measurements for nonsmoking subjects (N=36; 142 person days)

NONSMOKERS CO EXPOSURE <100 PPM



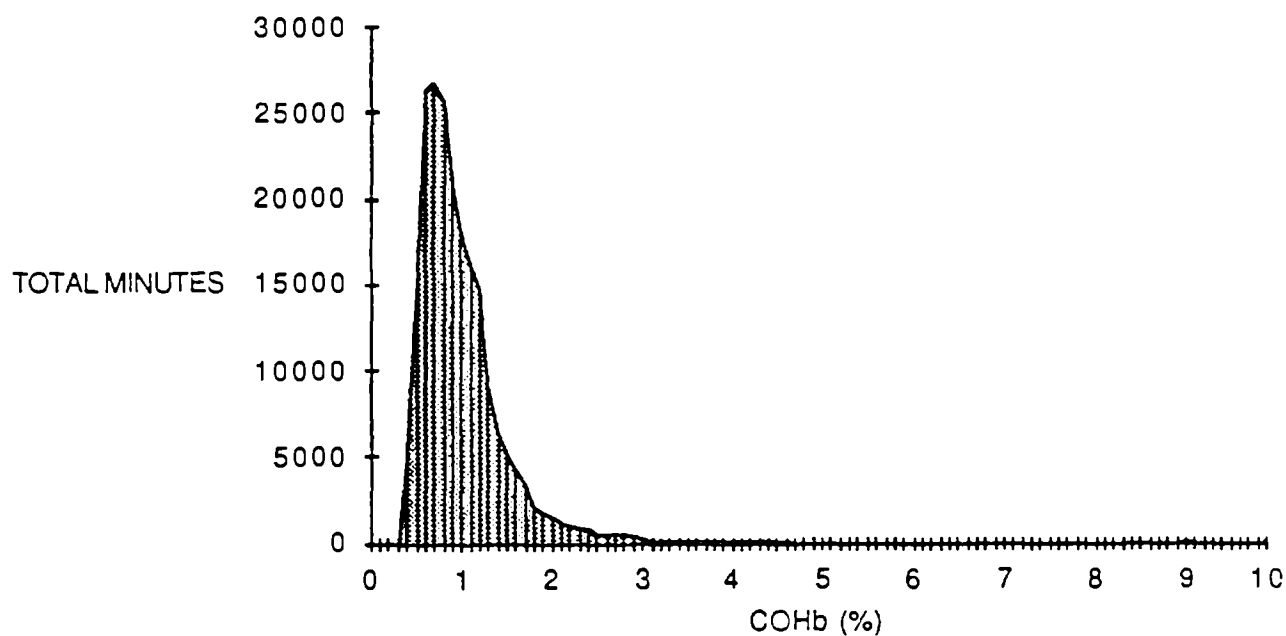
ENLARGEMENT OF CO DISTRIBUTIONS 10 -100 PPM



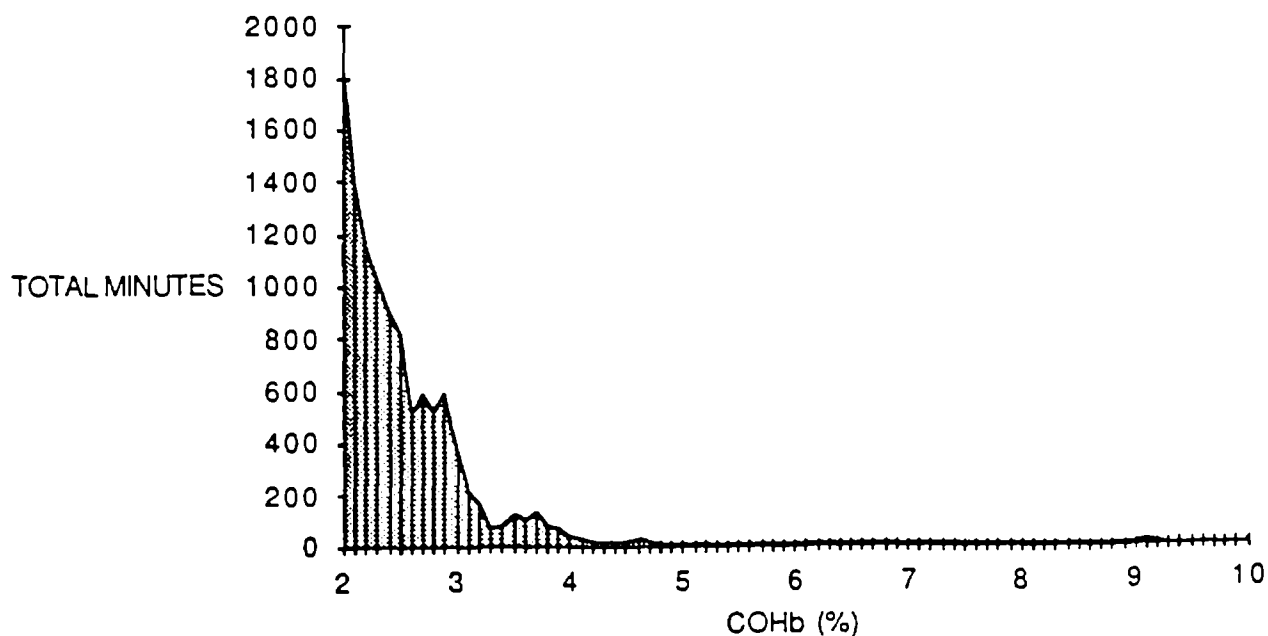
Activity data and microenvironmental CO exposures were combined to estimate the accumulation of CO in the blood. Coburn et al. (1965) have determined that several physiologic and environmental factors regulate CO flux: inhaled CO concentration, endogenous CO production, barometric pressure, diffusing capacity for CO, alveolar ventilation, blood volume, mean capillary oxygen tension, and oxyhemoglobin concentration. Duration of occupancy of microenvironments will determine uptake and washout, and the degree to which blood carboxyhemoglobin attains steady state with the setting's CO concentration. Increased levels of physical activity within a microenvironment will speed the rate at which uptake or elimination to steady state COHb is achieved. Strenuous activity such as exercise or yardwork is associated with increased minute alveolar ventilation and increased diffusing capacity for CO. An increase in either or both of these physiologic factors increases CO flux. Strenuous levels of activity were relatively infrequent across the IHD sample group. In general, the subjects' highest level of exertion would still be considered moderately light for individuals free of coronary artery disease. For these reasons, the requirements of uptake and elimination modeling become simplified and a linear model can be applied (Ott and Mage, 1978). This model assumes light physical activity and does not incorporate the input of individual physiologic parameters as the Coburn equation does. Preliminary analyses indicate that 56 percent of the IHD subjects experienced COHb levels in excess of 2.5 percent during the 142 person days of monitoring, corresponding to 1.8 percent of the total monitoring time (Figure 4.4-3).

Federal standards for ambient air are designed to prevent accumulation of CO in the body to levels where health effects have been demonstrated. The standards are set at 9 ppm for 8 hours and 35 ppm for one hour. Individuals

Figure 4.4-3. Distribution of minute-by-minute COHb estimates as predicted for nonsmoking IHD subjects by PEM measurements using the linear model of Ott and Mage (1978) (N=36; 142 person days)



ENLARGEMENT OF COHb DISTRIBUTION > 2.0%



exposed to CO at these concentrations and durations would develop carboxyhemoglobin levels of approximately 1.5 percent, a level below the 2-4 percent carboxyhemoglobin range at which exercise performance is impaired in people with ischemic heart disease (Anderson et al., 1983). Thus, the standards are set at levels which are intended to provide a margin of safety.

CO concentrations in microenvironment locations are poorly correlated with those measured at nearby outdoor sites (Ott et al., in press; Hartwell et al., 1984). Personal exposures experienced in settings such as commuting on freeways or walking on a roadside path may be several-fold higher than CO concentrations measured at the nearest ambient monitoring site. Further, it is reasonable to speculate that depending upon the conditions of the exposure (e.g., concentration, duration, breathing rate), the resulting carboxyhemoglobin concentrations may be elevated to levels higher than those estimated from outdoor fixed-site monitors. Further research is needed to address the relationship between ambient measurements and carboxyhemoglobin levels in the population. Alternative placements for monitors may give a more reliable measure of the actual personal exposures and the protection afforded to IHD subjects by the present federal standards.

4.5 Conclusions and Recommendations

4.5.1 Introduction

There are many components of an analytical evaluation of alternative carbon monoxide standards. Section 2 presented one theoretical framework, an economic model of individual behavior, which can, when aggregated over individuals, be used to evaluate different carbon monoxide standards. In this

framework, a person's utility is a function of health and goods or services consumed. The level of a person's health is modeled as a function of defensive expenditures D , pollution exposure P , and biological, social, and economic characteristics of the person (Z_1). It is assumed that a person maximizes utility, which is constrained by available income through an income constraint. Income may be deflated by previous expenses due to medical expenditures or by foregone wages due to loss of work.

In this project, we have gathered four kinds of information on the adverse effects of ischemic heart disease, including time spent sick (resulting in lost days of work or partial or full loss of employment) and medical expenditures made in response to illness (Section 4.1), rankings of the relative bothersomeness of the effects of angina/heart disease (Section 4.2.1), willingness to pay to avoid additional angina (Section 4.2.5), and defensive expenditures and activities (Section 4.3). We also have done a secondary analysis of data collected on personal CO exposure in the urban setting (Section 4.4).

We have thus developed a feasible framework for eliciting many of the components required for the evaluation of the impacts of carbon monoxide exposure on ischemic heart disease patients who experience angina pain. Additional components that still must be determined through other research efforts are

1. defining the relationship between carbon monoxide standards and resulting personal exposures to carbon monoxide in microenvironments;
2. quantifying the number of additional angina episodes per month that would occur due to changes in personal exposures to carbon monoxide, (the type of information that is needed will be of the form, "if the personal CO exposure is changed by an increment so that the average

level of carboxyhemoglobin (COHb) in the blood goes from 2 percent to 1 percent, and peak levels go from 3.5 percent to 2.5 percent, there would be x fewer angina episodes per month for people with moderately severe angina.");

3. characterizing the functional relationship between defensive expenditures (D), pollution exposure (P), and personal characteristics (Z1) in the health production function.

4.5.2 Summary of Results

Using multiple measures, the results converge on a picture of ischemic heart disease as a burdensome health state, with substantial medical costs, losses of opportunities to earn wages, psychological stress, and expenditures to avoid further adverse health effects.

Cost of Illness

Annual out-of-pocket medical expenditures due to ischemic heart disease for this sample averaged \$256 per person. This included out-of-pocket medical expenditures for treatment and medication and travel to the physician's office. It is important to note that this sample was dominated by VA patients who may have lower out-of-pocket expenses than the average IHD patient. Total annual medical expenditures due to heart disease incurred by society (including the VA, private insurers, but not the individual) averaged \$4,523 per person. For the 15 employed subjects, the average annual income lost due to time lost from the regular work schedule because of angina was about \$347. For the 19 subjects working less than they would like due to angina

(including those unable to work at all) the average annual income lost was about \$24,940. Thus, the total average annual loss due to medical expenditures and lost income (by the individual or on behalf of the individual) totalled \$14,359 per person across all 50 subjects. Because CO is believed to aggravate angina symptoms in patients who already have IHD, analysis was undertaken to estimate the marginal costs of small changes in angina frequency. The results suggest that although the total costs associated with IHD are substantial, the marginal cost of small changes in angina is minimal.

Lifestyle/Emotional/Physical Effects

In general, the subjects reported that the most bothersome effects of a potential increase in angina would be less ability to do desired activities (recreation, chores, or work), and pain or discomfort. The next two most bothersome effects were the patients' concern about worry or inconvenience to family and friends, and concern about the possibility of having a heart attack or bypass surgery. The remaining effects, in order of decreasing bothersomeness were less ability to work at a job (for reasons other than income), more non-medical expenses (such as paying for services), more medical treatment expenses, and less ability to earn income.

Willingness to Pay

The mean willingness to pay to avoid angina was \$40 per episode among the 42 subjects who responded with a dollar amount. When respondents who gave the answer "I'd pay anything I have to avoid added angina" were coded to be equal

to the highest amount they had agreed to when asked a close-ended question of the form "Would you pay \$y per month to avoid four (or eight) additional angina episodes per month?", the lower bound on the willingness to pay for all 49 responding subjects was \$42 per month. When those who would pay "anything" had their answers recoded to a feasibly maximum amount equal to their total monthly income, the average willingness to pay was \$103 per episode.

Expenses Due to Defensive Expenditures

Subjects were asked to itemize expenditures they made for goods or services to avoid additional angina. Twenty-one of the 50 subjects hired services (e.g., yard work, plumbing, or car maintenance), yielding an average annual expense of \$2,151, for these subjects. Sixteen of the 21 subjects estimated the number of added angina episodes they avoided by hiring services. The mean expenditure per episode for these 16 subjects was \$38, and ranged from \$3.50 to \$140. This mean may be compared to the average stated willingness to pay of \$28 per angina episode given by the same 16 subjects in response to Question 33.

Comparison of Alternative Dollar Measures of Changes in Well Being Due to Changes in Angina

Table 4.5-1 summarizes the dollar welfare estimates obtained from this study. The cost of illness estimates listed in the first section of the table are annual costs associated with all aspects of the heart disease. The figures given are averages for our sample, which should not be interpreted as representative of all IHD patients because the sample was not randomly

Table 4.5-1. Summary of dollar welfare estimates for ischemic heart disease patients

A. Average annual expenses related to IHD^{*}

Cost of illness expenses:

Medical expenses incurred by patient: (OPSUM2 = Sum of out-of-pocket medical expenses, less insurance premia. Cost of travel to obtain medical care included.)	\$256
Medical expenses paid by insurance or VA: (SOCSUM2 - OPSUM2)	\$4,523
Income Lost TWKLOSS = Employer paid sick days' cost and Lost wages due to angina (SWKLOSS)	\$9,581
Total cost of illness (COISOC)	<u>\$14,360</u>
Defensive expenditures ^{**}	903
Total IHD-related expenses (N = 50)	<u>\$15,263</u>

B. Alternative estimates of average willingness to pay per angina episode avoided for small changes in angina frequency

	<u>Mean WTP per episode</u>
1. Finite responses to open-ended contingent valuation question	\$40 (N = 42)
2. Defensive expenditure for specified angina reduction	\$38 (N = 16)

* These estimates are averages for our sample, which is not necessarily representative of all IHD patients. These costs varied considerably from one individual to another.

** This represents total defensive expenditures listed by each subject. For 29 subjects, this was \$0. The average for the 21 subjects with some defensive expenditures was \$2,151.

selected. In particular, medical insurance coverage may be greater than average because many of the subjects were completely covered by the Veterans Administration.

The second section of Table 4.5-1 shows the two alternative willingness to pay estimates obtained for small changes in angina frequency. We do not give any cost of illness estimate here because the analysis suggested that such costs do not vary significantly for small changes in angina frequency. The cost of illness (COI) approach has historically been the one most frequently used. Analysis of the COI data obtained for this sample did not show any significant relationship between costs and angina frequency. This suggests that the marginal welfare impact (as measured by COI) of marginal change in angina frequency is minimal. However, other information obtained in this study suggests that marginal changes in angina frequency do have a significant welfare impact. The willingness to pay and defensive expenditures analysis, when adjusted to per angina episode avoided, are generally comparable and in the range of \$25 to \$100 per episode. Even though there are significant concerns in accurately estimating economic value measures for changes in angina using willingness to pay and defensive expenditure approaches, their consistency with one another, and with the rankings of impact categories, suggest they may be more likely to accurately represent the value of marginal changes in angina than the results of a COI analysis.

Activity Patterns and CO Exposure

Data on activity patterns and CO exposure in urban locations was collected in an earlier UC Irvine research effort. An analysis of this data suggested that IHD patients frequently encounter CO in the course of their

daily activities and may develop COHb levels greater than 2.5 percent, a point where aggravation of angina has been observed in clinical studies.

4.5.3 Recommendations for Further Research

Several recommendations for further research have resulted from this pilot study. A subsequent larger study, with more funding, should include the suggested revisions and expansions. The recommendations are divided into the following three categories: carbon monoxide exposure, health effects resulting from CO exposure, and valuation of health effects in ischemic heart disease patients

Carbon Monoxide Exposure

- * Conduct further studies to link microenvironmental CO exposure to exposure at outdoor fixed-site monitors. Investigate the possibility of selecting alternative placements of monitors for more reliable measure of actual personal exposures.

Health Effects Resulting from CO Exposure

- * Conduct further studies to link actual personal CO exposure and angina by developing a dose-response curve which may be applied in the natural exposure environment of the community.

Valuation of Health Effects in Ischemic Heart Disease Patients

- * Conduct further contingent valuation studies with modifications suggested by this study and with a larger and more representative sample of IHD patients. This work would implement further tests of

the valuation methodology, such as investigating yea saying on referendum willingness to pay questions.

- * Conduct longitudinal studies following "healthy" people at risk of developing IHD (e.g., overweight males aged 35-50 with high blood pressure). Attitudes, behaviors, and willingness to pay to avoid symptoms would be monitored over a number of years. Preferences are expected to change with the onset of symptoms and over the developmental course of coronary disease.
- * Extend the framework developed for valuing angina in this project to consider explicitly the whole complex of health outcomes including heart attacks and cardiac death.
- * The present study assumed certain expenditures or behaviors were motivated by a desire to avoid additional angina. Further time-activity studies should explore how averting behaviors are chosen by angina patients, asking subjects to supply concurrent reasoning behind the choice of activities. People may consciously make tradeoffs between the costs of accepting more angina and the benefits of engaging in more activity.
- * It is important to understand how subjects are framing the valuation questions. For example, when a subject states his willingness to pay to avoid one additional angina episode is \$50, he may mean that \$50 is the sum total of actual costs incurred by one extra angina episode (e.g., due to doctor's office visits and medication), plus foregone wages due to work loss from the one episode, plus defensive expenditures (e.g., hiring a yard worker for that day), plus extra pay for pain and suffering. Alternatively, he may mean that \$50 is only the amount of extra pay for pain and suffering, or that it is his

maximum for any "similar" illness episode. Further, he also may mean that this is a measure of how much it would be worth to be "cured" of heart disease totally. The actual interpretation used by the subject may be discernible by follow-up questions in the survey. Then subjects could be divided into groups based on the concerns focused on, and separate analyses could be conducted for the subsample. To counteract the problem of shifting question framings, contingent valuation willingness to pay questions could be asked in several formats to focus the framing on the components which might be included in a person's response. For example, asking: "If you get one added angina episode out of four times you mow your own lawn, will you hire someone to mow your lawn all four times if it costs \$100?," will frame the amount as a defensive expenditure. Different framings would isolate the other components. In addition, the realism of the context for payment to avoid added episodes and believable degrees of incremental changes in number of episodes for each type of subject should be investigated.

- * Consider collecting representative prototypical patients and interviewing them in depth to determine their valuation of added adverse health effects. A decision analysis procedure in which each person's multiattribute utility function is assessed, and the preferences of the group of people are then aggregated, probably would work well in this setting.
- * Conduct studies to determine if the willingness to pay to avoid multiple health endpoints is additively cumulative. For example, a person with heart and lung disease may be adversely affected by carbon monoxide exposure in at least two ways: additional angina episodes

and obstructed breathing. A study could assess willingness to pay to avoid changes in all health endpoints at once and the results could be contrasted with those when subjects consider one health endpoint at a time. Then a formal model of whether the added effects have a diminishing effect on the cumulative willingness to pay could be constructed.

- * Obtain provider-verified medical expenses to improve the accuracy of the medical cost analysis.
- * A more extensive study also could obtain a larger data base on employment status and earning. Then an alternative average measure of workloss impacts could be obtained by using analytic statistical techniques to examine the effects of the existence and severity of IHD and angina on employment and earnings. However, a person's perceived work loss still is needed to evaluate and interpret the willingness to pay responses.
- * Assess values for two levels of change in angina episodes both across subjects (as in the pilot test for 4 and 8 episodes per month) and for each subject.
- * Assess perceived changes in cost of illness which would be associated with the hypothesized changes in angina incidence (i.e., 4 or 8 episodes) in the contingent valuation willingness to pay questions.
- * The pilot testing suggests that analysis of averting expenditures appears promising. This work can be pursued with more extensive modeling and data collection on multiple averting activities and on the resultant impacts on multiple health endpoints.

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HEART DISEASE PATIENTS' AVERTING BEHAVIOR,
COSTS OF ILLNESS, AND WILLINGNESS TO PAY
TO AVOID ANGINA EPISODES

APPENDICES FOR
FINAL REPORT TO

OFFICE OF POLICY ANALYSIS
U.S. ENVIRONMENTAL PROTECTION AGENCY

OCTOBER, 1988

by

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Appendix

APPENDIX (UCI)

1. Subject Screening Interview Questions
2. Questionnaires
 - Cover Letter
 - Subject Version
 - Interviewer Version
3. Data Codebook
4. Aggregate Results

Appendix 1

SUBJECT: _____

INTERVIEWED BY: _____

ADDRESS: _____

DATE INTERVIEWED: _____

PHONE: _____

Hello, may I speak to Mr. _____:

My name is _____ and I am calling from the University of California Irvine. In the past, you have helped us with different research projects involving your heart health and monitoring of air pollution.

We are again preparing for another project and were hoping to be able to interview you again regarding your recent heart health and any experiences you have had with angina. The questions I have are just short answer questions and will take about five (5) minutes of your time.

Is this a convenient time to do the interview or is there another time that would be better? (If it is convenient, proceed to question 1 introduction. If not, set up a time that you can call back.)

TIME TO CALL BACK: _____

To help us prepare for the new project, we would like to ask you a few questions regarding your heart health. You may have answered these in the past for us, but we would appreciate your answers again.

1. HAVE YOU HAD CHEST PAIN DURING THE PAST 12 MONTHS? (Do not include pain due to a cold or to an accident or injury.)

_____ Yes (Go to question 3)

_____ No

2. HAVE YOU HAD ANY DISCOMFORT, HEAVINESS OR PRESSURE IN YOUR CHEST DURING THE PAST 12 MONTHS? (Not caused by a cold or by an accident or injury.)

_____ Yes

_____ No (Go to question 8)

3. HOW OFTEN DO YOU GET THIS FEELING IN YOUR CHEST? (Circle)

- 1 Almost every day
- 2 A few times a week
- 3 About once a week
- 4 A few times a month
- 5 About once a month
- 6 Less than once a month

4. DO YOU GET THIS FEELING IN YOUR CHEST WHEN YOU WALK UPHILL OR HURRY?

_____ Yes

_____ No

5. DO YOU GET THIS FEELING IN YOUR CHEST WHEN YOU WALK AT AN ORDINARY PACE ON LEVEL GROUND?

_____ Yes

_____ No

6. WHAT DO YOU USUALLY DO WHEN YOU GET THIS FEELING IN YOUR CHEST WHILE WALKING?

_____ Stop for a while

_____ Slow down

_____ Continue at same pace

_____ Take a nitroglycerine

7. WHERE DO YOU USUALLY FEEL THIS PAIN?

_____ Left side of chest

_____ Right side of chest

_____ Middle of chest

_____ Neck or jaw

_____ Left arm

_____ Right arm

8. HAS A DOCTOR EVER SAID THAT YOU HAD ANGINA? (An-JI-na or AN-ji-na)

_____ Yes (Go to question 13)

_____ No (Go to end of questionnaire, Part A)

9. DURING THE PAST 3 MONTHS, HOW MUCH PAIN HAS YOUR CHEST PAIN OR HEART TROUBLE CAUSED YOU?

_____ A great deal of pain

_____ Some pain

_____ A little pain

_____ No pain at all

10. DURING THE PAST 3 MONTHS, HOW MUCH HAS YOUR CHEST PAIN OR HEART TROUBLE WORRIED OR CONCERNED YOU?

_____ A great deal

_____ Somewhat

_____ A little

_____ Not at all

11. DURING THE PAST 3 MONTHS, HOW MUCH OF THE TIME HAS YOUR CHEST PAIN OR HEART TROUBLE KEPT YOU FROM DOING THE KINDS OF THINGS OTHER PEOPLE YOUR AGE DO?

_____ All of the time

_____ Most of the time

_____ Some of the time

_____ A little of the time

_____ None of the time

12. DURING THE PAST 30 DAYS, HOW MANY DAYS HAS YOUR CHEST PAIN OR HEART TROUBLE KEPT YOU IN BED ALL DAY OR MOST OF THE DAY? (If none, write in "0".)

_____ days in bed. (Go to end of questionnaire, Part B.)

13. WHEN DID YOU LAST SUFFER CHEST PAIN OR SYMPTOMS THAT YOUR PHYSICIAN CALLED ANGINA?

_____ number of months ago

14. WHY DID YOUR ANGINA STOP? WAS IT BECAUSE OF:

_____ your prescribed medication

_____ angioplasty

_____ coronary artery bypass surgery

_____ lifestyle changes (changed diet, started exercise program, etc.)

15. WHEN YOU HAD THESE EPISODES OF ANGINA, HOW OFTEN DID THEY OCCUR?

- ☐ about every day
- ☐ a few times a week
- ☐ about once a week
- ☐ a few times a month
- ☐ about once a month
- ☐ less than once a month

16. DID YOU GET THIS FEELING WHEN YOU WALKED UPHILL OR HURRIED?

- ☐ Yes
- ☐ No

17. DID YOU GET THIS FEELING IN YOUR CHEST WHEN YOU WALKED AT AN ORDINARY PACE ON LEVEL GROUND?

- ☐ Yes
- ☐ No

18. WHAT DID YOU USUALLY DO WHEN YOU GOT THIS FEELING IN YOUR CHEST WHILE WALKING?

- ☐ Stop for a while
- ☐ Slow down
- ☐ Continue at same pace
- ☐ Take a nitroglycerine

19. WHERE DID YOU USUALLY FEEL THIS PAIN?

- ☐ Left side of chest
- ☐ Right side of chest
- ☐ Middle of chest
- ☐ Neck or jaw
- ☐ Left arm
- ☐ Right arm

20. WHEN YOU HAD THIS CHEST PAIN OR HEART TROUBLE, HOW MUCH PAIN DID IT CAUSE YOU?
- _____ A great deal of pain
 - _____ Some pain
 - _____ A little pain
 - _____ No pain at all
21. WHEN YOU HAD THIS CHEST PAIN OR HEART TROUBLE, HOW MUCH WORRY OR CONCERN DID IT CAUSE YOU?
- _____ A great deal
 - _____ Somewhat
 - _____ A little
 - _____ Not at all
22. WHEN YOU HAD THIS CHEST PAIN OR HEART TROUBLE, HOW MUCH OF THE TIME DID IT KEEP YOU FROM DOING THE KINDS OF THINGS OTHER PEOPLE YOUR AGE DID?
- _____ All of the time
 - _____ Most of the time
 - _____ Some of the time
 - _____ A little of the time
 - _____ None of the time

(Go to end of questionnaire, Part B)

PART A (If the subject has NOT experienced angina:)

That concludes the questions that we have. I appreciate your time in answering them. We also want to thank you again for your help to us in the past projects that we have had and hope the opportunity will come when we might be able to work with you again.

PART B (If subject has experienced angina:)

That concludes the questions we have for you today and we appreciate your time. The project that we spoke about at the beginning of this phone call will be coming up within the next two (2) months. We would like to call you again for a more lengthy interview, possibly 45 minutes or so, regarding what changes you have made in your lifestyle due to the angina pain you have had. We will be asking questions about the types of activities you are involved in and how air pollution effects what you do. Do you feel you would be able to be involved in that interview?

If yes: For that interview, do you have a preference of day of the week or time of day to be contacted?

Preference _____

23. Are you currently smoking cigarettes, cigars or a pipe?

_____ No

_____ Yes. How many per week/day?

_____ Cigarettes -- Packs per day/week (Convert figure to ppw)

_____ Cigars per day

_____ Pipes, bowls per day

May I also confirm your mailing address? I have (see top of front page, making any changes needed there - check zip code also):

Again, thank you for your time today and I look forward to talking with you in the near future.

PARTICIPATED IN:	<u>Yes</u>	<u>No</u>
24. Mail-in diary	_____	_____
25. CO PEM diary	_____	_____
26. CO/ECG diary	_____	_____
27. Telephone interview	_____	_____
28. Palmes Tubes	_____	_____
29. Kleinman Exposure/Exercise	_____	_____

Appendix 2

UNIVERSITY OF CALIFORNIA, IRVINE

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

PROGRAM IN SOCIAL ECOLOGY

IRVINE, CALIFORNIA 92717

August 9, 1986

NO ITEM TO INSERT

Dear

NO ITEM TO INSERT

:

Several months ago, at the time of your exercise test at UCI, we requested your help in a one-time phone interview assessing how your heart condition affects your lifestyle. We thank you for agreeing to participate. We have enclosed a copy of the questionnaire for you to read before we call you. You may want to write down some of your answers or make notes to yourself about things you want to tell us. We will be writing down your answers for you during the course of the interview and therefore you do not need to worry about returning this questionnaire to us. Your answers will be held in strict confidence.

We expect it will take 45 minutes to complete the telephone interview. Of course the interview will go more quickly if you have thought about your answers beforehand. We will call you during the afternoon or early evening hours. If we should reach you at an inconvenient time please tell us, and we will be happy to reschedule. The earliest date at which we will try to telephone you is

NO ITEM TO INSERT

.

Again, thank you for your continued interest in this research. We will look forward to talking with you.

If you should have any questions, please feel free to call me at (714) 856-5545.

Sincerely,

William E. Lambert
Research Associate

WEL:fr
Encls.

CORONARY HEART DISEASE STUDY
QUESTIONNAIRE

I. CURRENT ANGINA STATUS

1. Have you ever had angina related pain, discomfort, heaviness, or pressure in your chest (not caused by a cold or by an accident or injury)?

NO
YES

2. Do you (or did you) get this feeling when you walk uphill or hurry?

NO
YES

3. Do you (or did you) get this feeling when you walk at an ordinary pace on level ground?

NO
YES

4. Has a doctor ever said that you have angina?

NO
YES

Coronary heart disease patients sometimes have pressure or heaviness in their chests even if they do not report it as angina pain. In the following questions, references to angina pain and discomfort are meant to include such episodes of pressure or heaviness.

5. Do you still have angina pain or discomfort sometimes, or do you no longer have it?

- 1 NO LONGER HAVE IT
2 STILL HAVE IT SOMETIMES

Interviewer will ask some additional questions and then skip to Question 9

6. For each season, please check the box under the angina frequency level that best describes how often you usually have angina in that season.

<u>Season</u>	<u>Level of Frequency</u>								
	1 NEVER OCCURS	2 LESS THAN ONCE A MONTH	3 ABOUT ONCE A MONTH	4 ABOUT TWICE A MONTH	5 ABOUT ONCE A WEEK	6 ABOUT 2 OR 3 TIMES A WEEK	7 ABOUT ONCE A DAY	8 ABOUT TWICE A DAY	9 3 TIMES A DAY OR MORE
SUMMER (Jun-Aug)									
FALL (Sep-Nov)									
WINTER (Dec-Feb)									
SPRING (Mar-May)									

7. For each season, please check the box under the angina severity (discomfort) level that best describes how severe your angina tends to be in that season.

<u>Season</u>	<u>Level of Discomfort (Severity)</u>						
	1 NONE	2 VERY MILD	3 MILD	4 MODERATE	5 MODERATELY SEVERE	6 SEVERE	7 VERY SEVERE
SUMMER (Jun-Aug)							
FALL (Sep-Nov)							
WINTER (Dec-Feb)							
SPRING (Mar-May)							

8. During the past 12 months, how many days has angina pain or discomfort kept you resting on the couch or chair or in bed for most of the day?

_____ days

II. ANGINA EPISODES: PREVENTION AND RESPONSE

Medical Care

9. Do you have medical insurance or participate in any program that pays part or all of your medical bills?

NO —————→ Why not? _____

YES —————→

9a. Circle all that apply:

- 1 PRIVATE MEDICAL INSURANCE
- 2 VA BENEFITS
- 3 MEDICARE
- 4 HEALTH MAINTENANCE PROGRAM
- 5 OTHER (please specify) _____

9b. What is the total monthly cost to you of this coverage (insurance premiums, membership fees)?

\$ _____

9c. What percentage (or dollar amount) of your medical expenses for office visits, hospital services, and prescription medication are covered under this (these) program(s)?

doctor office
visit..... _____

emergency room and
hospital services
(including surgery). _____

prescription
medication..... _____

10. How far do you drive each way to see the doctor about your heart condition?

_____ miles

11. Do you go for regular checkups?

NO

YES

11a. How often do you go for checkups? _____

11b. What is the average cost to you of a checkup?
(Do not include any amount paid by insurance.)

\$ _____

12. How many times in the past 12 months have you visited the doctor's office because of angina or other heart problems (in addition to any regular checkups)?

_____ doctor's office visits

(If more than 0) What was the cost to you of your last office visit due to angina or other heart problems?
(Do not include any amount paid by insurance.)

\$ _____

13. Please list all the prescription medications you are presently taking for your heart condition. You may simply give the prescription information directly from the bottles.

<u>Medication Name</u>	<u>Dose</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

14. What is the average monthly cost to you of all the medications you take for your heart problem? (Do not include any amount paid by insurance.)

\$ _____

15. Have you been to the emergency room in the past 12 months due to your angina or other heart problems?

NO

YES →

15a. How many times? _____

15b. What was the cost to you of your last emergency room visit? (Do not include any amount paid by insurance.)

\$ _____

16. Have you stayed overnight in a hospital in the last 12 months because of angina or other heart problems?

NO

YES →

Please list (starting with most recent stay):

Dates	Length of Stay	Cause/Treatment	Cost to You
_____	_____ days	_____	\$ _____
_____	_____ days	_____	\$ _____
_____	_____ days	_____	\$ _____

17. In the past 12 months, have you had any other medical treatment or been in any exercise program (including use of exercise equipment in your home) for your heart condition?

NO

YES →

Please give type of treatment and annual cost to you. (Do not include any amount paid by insurance.) If it involves a one-time only purchase such as exercise equipment, please give the amount spent in the past year:

<u>Treatment</u>	<u>Cost to You in the Past Year</u>
_____	\$ _____
_____	\$ _____
_____	\$ _____

Lifestyle Changes and Related Expenditures

18. Which of the following things do you think sometimes bring on or aggravate your angina? (Circle all that apply)

- 1 COLD TEMPERATURE
- 2 STRESS OR ANXIETY
- 3 EXCITEMENT
- 4 PHYSICAL EXERTION (SUCH AS WALKING FAST OR HEAVY LIFTING)
- 5 AIR POLLUTION
- 6 CIGARETTE SMOKE
- 7 MEALS (PAIN AFTER MEALS OR AFTER CERTAIN FOODS OR BEVERAGES)
- 8 OTHERS (please describe) _____

Which do you think is the most important factor? _____

19. What kinds of changes do you make in your activities on days when for any reason you feel you are more likely to have an angina episode? (Circle all that apply)

- 1 MAKE NO CHANGES IN ACTIVITIES
- 2 AVOID ACTIVE RECREATIONAL ACTIVITIES
- 3 AVOID PHYSICAL EXERTION SUCH AS HOUSEWORK OR YARDWORK
- 4 SLEEP OR REST MORE
- 5 TAKE TIME OFF FROM WORK
- 6 STAY HOME
- 7 DO THE SAME ACTIVITIES, BUT AT A SLOWER PACE
- 8 AVOID EMOTIONAL STRESS
- 9 AVOID EXPOSURE TO HOT OR COLD WEATHER
- 10 AVOID EXPOSURE TO AIR POLLUTION
- 11 AVOID EXPOSURE TO CIGARETTE SMOKE
- 12 OTHER (please specify) _____

20. In the past 12 months, have you hired any help for yard work, home or auto maintenance, or housework to reduce or prevent angina or other problems related to your heart condition?

NO
YES

Interviewer will ask some additional questions and then skip to Question 21.

20a. Please give an example of the type of help you hire most often. Consider only work that you would prefer to do yourself rather than have someone else do.

20b. How often do you hire help for this purpose?

_____ times per year

20c. On average, how much does this cost you?

\$_____ per year

20d. If you did this work yourself for a year, do you believe you would probably have more frequent angina?

NO

YES →

If you did this work yourself, how many additional angina episodes per year do you think you would get, over what you now get?

_____ additional episodes per year

20e. If you did this work yourself for a year, do you think the severity of your angina episodes after doing this work would be worse or be about the same as your current angina episodes?

1 ABOUT THE SAME

2 WORSE →

Using our 1 to 7 scale, how severe do you think your angina episodes after doing this work would be?

- 1 NO DISCOMFORT
- 2 VERY MILD DISCOMFORT
- 3 MILD DISCOMFORT
- 4 MODERATE DISCOMFORT
- 5 MODERATELY SEVERE DISCOMFORT
- 6 SEVERE DISCOMFORT
- 7 VERY SEVERE DISCOMFORT

20f. If you did this work yourself for a year, do you believe this might increase your chances of having a heart attack?

NO

YES →

If you did this work for a year, how much do you think this would add to your chances of having a heart attack during the year?

- 1 ADD A SMALL AMOUNT (ADD LESS THAN 5%)
- 2 ADD A MODERATE AMOUNT (ADD 5-10%)
- 3 ADD A MODERATELY LARGE AMOUNT (ADD 11-25%)
- 4 ADD A LARGE AMOUNT (ADD MORE THAN 25%)
- 5 OTHER (please explain) _____

20g. Do you hire this help for any other reasons, in addition to possible concern about angina and heart attack risks?

NO

YES →

Please explain:

20h. Please list any other examples of help you hire due to your heart condition. Please describe the type of help, for example help with housework or home maintenance, and estimate how many times in the past year you hired this help. Please do not include any help that you think you would hire even if you did not have any trouble with your heart.

Type of Help

Times Hired

_____	_____ in past year
_____	_____ in past year
_____	_____ in past year
_____	_____ in past year

20i. In the past year, have you purchased any special equipment or made structural changes in your home to reduce physical exertion that might aggravate your heart problem? Examples might be an electric garage door opener or the addition of a ground-floor bedroom.

NO

YES →

Please describe each expenditure and give the cost to you in the past year. Do not include any expenditures that you think you would have made even if you did not have any trouble with your heart.

Type of Expenditure

Cost to You
in Past Year

_____	\$ _____
_____	\$ _____
_____	\$ _____

Employment

21. Are you employed?

NO
YES

Interviewer will ask some additional questions and then skip to Question 22

21a. What are your average total hours per week (all jobs)?

_____ hours per week

21b. What kind of work do you do (occupation)?

Job 1 _____

Job 2 _____

21c. How many days have you missed from work (all jobs) in the past year due to angina or other illness related to your heart problem?

_____ days

21d. Do you have paid sick leave?

NO
YES

Does it cover all of the time you typically miss from work due to all types of illness?

NO
YES

Please estimate how many days you missed from work due to all types of illness in the past year that were not covered by sick leave.

_____ days

21e. Have you changed jobs in the past 5 years because of your heart condition?

NO
YES

Did the job change mean a reduction in income?

NO
YES

21f. Are you working fewer hours than you would like because of your heart condition?

NO

YES →

How many hours per week would you like to be working?

_____ hours per week

21g. Please indicate the category that represents how much you earn annually at your current job(s).

- | | |
|-----------------------|------------------------|
| 1 LESS THAN \$4,999 | 7 \$30,000 - \$34,999 |
| 2 \$ 5,000 - \$9,999 | 8 \$35,000 - \$39,999 |
| 3 \$10,000 - \$14,999 | 9 \$40,000 - \$44,999 |
| 4 \$15,000 - \$19,999 | 10 \$45,000 - \$49,999 |
| 5 \$20,000 - \$24,999 | 11 \$50,000 - \$59,999 |
| 6 \$25,000 - \$29,999 | 12 \$60,000 OR MORE |

III. IMPORTANCE OF CHANGES IN ANGINA

22. Please think of your most recent angina episode that you would say was typical. When did this occur?

23. Where were you?

24. What were you doing?

25. How long were you doing this activity?

_____ minutes

26. How long did the pain or discomfort last?

_____ minutes

27. What did you do after this typical angina episode began? (Check all that apply)

- 1 STOPPED FOR A WHILE AND RESTED. LATER RESUMED THE ACTIVITY.
How long did you rest before starting again? _____ mins.
- 2 STOPPED THE ACTIVITY ALTOGETHER.
- 3 CONTINUED AT THE SAME PACE.
- 4 SLOWED DOWN BUT DID NOT STOP.
- 5 TOOK NITROGLYCERIN OR OTHER MEDICATION.
- 6 OTHER, please describe: _____

Which of these was the most important means of relief for this particular episode? _____

28. Sometimes an angina episode may cause you some inconvenience, expense, or other effect on your life. Which of the following possible effects of this angina episode bothered you? (Check all that apply)

- 1 MEDICAL TREATMENT EXPENSES.
- 2 LOST INCOME.
- 3 NON-MEDICAL EXPENSES (SUCH AS PAYING FOR SERVICES).
- 4 PAIN AND DISCOMFORT.
- 5 LESS ABILITY TO WORK AT A JOB (FOR REASONS OTHER THAN INCOME).
- 6 LESS ABILITY TO DO DESIRED ACTIVITIES (RECREATION, CHORES, ETC.).
- 7 CONCERN TO YOU ABOUT POTENTIAL HEART ATTACK OR BYPASS SURGERY.
- 8 CONCERN TO YOU ABOUT WORRY OR INCONVENIENCE TO FAMILY AND FRIENDS DUE TO YOUR HEALTH.
- 9 OTHER, please explain _____

Which was most bothersome to you? _____

29. If there was any actual monetary cost to you due to this episode, can you estimate how much it was? \$ _____

The interviewer will now ask a few questions about other angina episodes you have had. Before the interviewer calls, you may wish to think about the worst angina episode you have had and about the mildest episodes you have had.

31. This question is about how you think you would be affected if your heart condition were to become worse, causing you to have angina pain or discomfort more often than you do now. We are interested in finding out how much the different effects of such a change in your condition would bother you, once you had done what you could to minimize the effects.

Listed below are some effects on your life that might occur if you were to have angina more often. For the effect that would be most bothersome to you, circle the number 10. For the effect that would be least bothersome to you, circle the number 1. For the remaining effects on the list, please circle the number that best describes how bothersome it would be relative to these extremes. You may circle the same number for more than one effect if they would be equally bothersome to you.

<u>Effects you may experience if your angina worsened</u>	<u>Relative bothersomeness of the effect</u>									
	<u>Least Bothersome</u>					<u>Most Bothersome</u>				
a. More medical treatment expenses.	1	2	3	4	5	6	7	8	9	10
b. Less ability to earn income.	1	2	3	4	5	6	7	8	9	10
c. More non-medical expenses (such as paying for services).	1	2	3	4	5	6	7	8	9	10
d. More pain or discomfort.	1	2	3	4	5	6	7	8	9	10
e. Less ability to work at a job (for reasons other than income).	1	2	3	4	5	6	7	8	9	10
f. Less ability to do desired activities (recreation, chores, etc.).	1	2	3	4	5	6	7	8	9	10
g. More concern to you about potential heart attack or bypass surgery.	1	2	3	4	5	6	7	8	9	10
h. More concern to you about worry or inconvenience to family and friends due to your health.	1	2	3	4	5	6	7	8	9	10

32. Suppose your heart condition were to become worse so that with your current medical treatment and lifestyle your angina episodes would occur more often. Suppose also that a new medical treatment were available that could prevent the additional angina without causing undesirable side effects or requiring lifestyle changes.

If the treatment would prevent ____ additional angina episodes per month and if you had to pay the entire cost yourself, would you take the treatment if it cost \$_____ each month?

NO
YES

Would you take the treatment if it cost \$_____ each month?

NO
YES

Would you take the treatment if it cost \$_____ each month?

NO
YES

33. What is the most that you would pay for this treatment if it would prevent ____ additional angina episodes per month?

\$ _____ per month

IV. HEART DISEASE HISTORY

34. Has a doctor ever said you had a heart attack?

NO
YES

Please list dates starting with most recent (month and year is sufficient):

35. Has a doctor ever recommended you have coronary artery bypass surgery?

NO →

Has the doctor said why not?

YES →

Did you have the surgery?

NO →

Why not?

YES →

Please list dates (starting with most recent):

36. Have you ever had angioplasty to improve the blood flow to your heart tissue? (Angioplasty involves catheterization with a balloon catheter that expands narrowed coronary arteries.)

NO

YES →

Please list dates (starting with most recent):

Was blood flow improved?

NO
YES

37. Each time you have an angina episode, do you believe (Circle the best answer):

- 1 YOUR HEART MAY BE HARMED A SMALL AMOUNT AND PROBABLY DOES NOT HEAL?
- 2 YOUR HEART MAY BE HARMED A SMALL AMOUNT BUT PROBABLY DOES HEAL?
- 3 YOUR HEART IS PROBABLY NOT HARMED, THE ANGINA IS SIMPLY YOUR BODY'S WARNING TO SLOW DOWN?
- 4 OTHER (please explain) _____

38. Circle the number on the scale that best describes how often the statement has been true for you in the past few years.

- | | |
|---|---|
| a. I get as much exercise as my physical condition allows. | NEVER.....ALWAYS
1 2 3 4 5 6 7 |
| b. I exert myself physically until I begin to feel angina pain or discomfort. | NEVER.....ALWAYS
1 2 3 4 5 6 7 |
| c. I follow the diet recommendations of my doctor. | NEVER.....ALWAYS
1 2 3 4 5 6 7 |
| d. I watch my pulse rate during exercise or take my blood pressure at home. | NEVER.....ALWAYS
1 2 3 4 5 6 7 |
| e. I am under a lot of stress. | NEVER.....ALWAYS
1 2 3 4 5 6 7 |

V. PERCEPTIONS ABOUT AIR POLLUTION

39. How do you usually tell when air pollution is high? (Circle all that apply)

- 1 DON'T USUALLY NOTICE AIR POLLUTION
- 2 SEE OR HEAR REPORTS IN THE NEWSPAPER, TV OR RADIO
- 3 SEE IT IN THE AIR
- 4 FEEL IT AFFECTING MY EYES OR LUNGS
- 5 SMELL IT
- 6 OTHER (please describe) _____

40. How often do you think there is enough air pollution in the areas where you live or work to affect your health or the health of others?

- 1 NEVER
- 2 LESS THAN 7 DAYS PER YEAR
- 3 7 TO 14 DAYS PER YEAR
- 4 14 TO 30 DAYS PER YEAR
- 5 30 TO 60 DAYS PER YEAR
- 6 MORE THAN 60 DAYS PER YEAR

41. (If you think air pollution sometimes aggravates your angina) On days when you are concerned that air pollution might affect your angina, what do you usually do? (Circle all that apply)

- 1 NOTHING DIFFERENT, KEEP TO MY USUAL ROUTINE
- 2 SPEND LESS TIME OUTDOORS
- 3 EXERCISE LESS
- 4 GO TO A LESS POLLUTED AREA OR PART OF TOWN
- 5 OTHER (please specify) _____

42. Please indicate the level of air pollution you think is usually associated with each of the following activities or locations.

	<u>Low Pollution</u>			<u>High Pollution</u>	
a. Driving at rush hour.	1	2	3	4	5
b. Driving on city streets in normal traffic.	1	2	3	4	5
c. Driving on freeways in normal traffic.	1	2	3	4	5
d. Walking on city streets.	1	2	3	4	5
e. Outdoors, near your home.	1	2	3	4	5
f. Outdoors, in parks or other public places.	1	2	3	4	5
g. Indoors, in restaurants, stores, or other public places.	1	2	3	4	5
h. Indoors, in your home.	1	2	3	4	5

VI. ADDITIONAL BACKGROUND QUESTIONS

43. Please indicate the category that represents your household's current annual income, including any disability payments.

1 LESS THAN \$ 4,999	7 \$30,000 - \$34,999
2 \$ 5,000 - \$ 9,999	8 \$35,000 - \$39,999
3 \$10,000 - \$14,999	9 \$40,000 - \$44,999
4 \$15,000 - \$19,999	10 \$45,000 - \$49,999
5 \$20,000 - \$24,999	11 \$50,000 - \$59,999
6 \$25,000 - \$29,999	12 \$60,000 OR MORE

The interviewer will now ask a few additional background questions.

DATE _____
SUBJECT _____
INTERVIEWER _____

INTERVIEWER VERSION

CORONARY HEART DISEASE STUDY
QUESTIONNAIRE

I. CURRENT ANGINA STATUS

SUB.
P.#

- 1 1. Have you ever had angina related pain, discomfort, heaviness, or pressure in your chest (not caused by a cold or by an accident or injury)?
- 1 NO
2 YES
- 1 2. Do you (or did you) get this feeling when you walk uphill or hurry?
- 1 NO
2 YES
- 1 3. Do you (or did you) get this feeling when you walk at an ordinary pace on level ground?
- 1 NO
2 YES
- 1 4. Has a doctor ever said that you have angina?
- 1 NO
2 YES
- Coronary heart disease patients sometimes have pressure or heaviness in their chests even if they do not report it as angina pain. In the following questions, references to angina pain and discomfort are meant to include such episodes of pressure or heaviness.
- 1 5. Do you still have angina pain or discomfort sometimes, or do you no longer have it?
- 1 NO LONGER HAVE IT
2 STILL HAVE IT SOMETIMES

→ INTERVIEWER: GO TO ALT-6

(INTERVIEWER: THIS BLOCK OF QUESTIONS IS NOT ON THE SUBJECT'S VERSION, BUT SHOULD BE ASKED INSTEAD OF QUESTIONS 6-8 FOR THOSE WHO ANSWER 1 TO QUESTION 5)

ALT-6. If you no longer have angina pain or discomfort, did you formerly have angina pain or discomfort that has been stopped due to surgery, treatment, or due to some other reason?

- 1 NO —————→
2 YES —————↓

INTERVIEWER: STOP INTERVIEW AND DISCUSS

ALT-6a. When was the last time you experienced angina?

_____ years or months ago (Circle years or months)

ALT-6b. What do you think stopped the angina? (Circle all that apply)

- 1 BYPASS SURGERY
2 MEDICATION
3 LIFESTYLE ADJUSTMENTS
4 ANGIOPLASTY
5 OTHER (please explain) _____

ALT-6c. How often did you have angina when you used to have it? (Circle best answer)

- 1 NEVER OCCURRED
2 LESS THAN ONCE A MONTH
3 ABOUT ONCE A MONTH
4 ABOUT TWICE A MONTH
5 ABOUT ONCE A WEEK
6 ABOUT 2 OR 3 TIMES A WEEK
7 ABOUT ONCE A DAY
8 ABOUT TWICE A DAY
9 3 TIMES A DAY OR MORE

ALT-6d. How uncomfortable or severe was your angina when you used to have it? (Circle best answer)

- 1 NO DISCOMFORT
2 VERY MILD DISCOMFORT
3 MILD DISCOMFORT
4 MODERATE DISCOMFORT
5 MODERATELY SEVERE DISCOMFORT
6 SEVERE DISCOMFORT
7 VERY SEVERE DISCOMFORT

SKIP TO QUESTION 9 (SUBJECT PAGE NO. 3)

- 2 6. For each season, please check the box under the angina frequency level that best describes how often you usually have angina in that season.

<u>Season</u>	<u>Level of Frequency</u>								
	1 NEVER OCCURS	2 LESS THAN ONCE A MONTH	3 ABOUT ONCE A MONTH	4 ABOUT TWICE A MONTH	5 ABOUT ONCE A WEEK	6 ABOUT 2 OR 3 TIMES A WEEK	7 ABOUT ONCE A DAY	8 ABOUT TWICE A DAY	9 3 TIMES A DAY OR MORE
SUMMER (Jun-Aug)									
FALL (Sep-Nov)									
WINTER (Dec-Feb)									
SPRING (Mar-May)									

- 2 7. For each season, please check the box under the angina severity (discomfort) level that best describes how severe your angina tends to be in that season.

<u>Season</u>	<u>Level of Discomfort (Severity)</u>						
	1 NONE	2 VERY MILD	3 MILD	4 MODERATE	5 MODERATELY SEVERE	6 SEVERE	7 VERY SEVERE
SUMMER (Jun-Aug)							
FALL (Sep-Nov)							
WINTER (Dec-Feb)							
SPRING (Mar-May)							

- 2 8. During the past 12 months, how many days has angina pain or discomfort kept you resting on the couch or chair or in bed for most of the day?

_____ days

(INTERVIEWER: IF SUBJECT INDICATES RECALL TROUBLE
ASK ABOUT PAST 3 MONTHS: _____ DAYS)

II. ANGINA EPISODES: PREVENTION AND RESPONSE

Medical Care

- 3 9. Do you have medical insurance or participate in any program that pays part or all of your medical bills?

1 NO —————>

Why not? _____

2 YES —————>

9a. Circle all that apply:

- 1 PRIVATE MEDICAL INSURANCE
- 2 VA BENEFITS
- 3 MEDICARE
- 4 HEALTH MAINTENANCE PROGRAM
- 5 OTHER (please specify) _____

9b. What is the total monthly cost to you of this coverage (insurance premiums, membership fees)?

\$ _____

9c. What percentage (or dollar amount) of your medical expenses for office visits, hospital services, and prescription medication are covered under this (these) program(s)?

(INTERVIEWER-ASK ABOUT DEDUCTIBLES AND FIXED FEES, IF APPLICABLE, AND CLEARLY MARK RESPONSES.)

doctor office
visit..... _____

emergency room and
hospital services
(including surgery).. _____

prescription
medication..... _____

3 10. How far do you drive each way to see the doctor about your heart condition?

_____ miles

4 11. Do you go for regular checkups?

1 NO

2 YES

11a. How often do you go for checkups?

_____ (INTERVIEWER MARK IN TIMES PER YEAR)

11b. What is the average cost to you of a checkup?
(Do not include any amount paid by insurance.)

\$ _____

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE
CO. IS CHARGED? \$ _____)

4 12. How many times in the past 12 months have you visited the doctor's office because of angina or other heart problems (in addition to any regular checkups)?

_____ doctor's office visits

(If more than 0) What was the cost to you of your last office visit due to angina or other heart problems? (Do not include any amount paid by insurance.)

\$ _____

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. WAS
CHARGED? \$ _____)

- 4 13. Please list all the prescription medications you are presently taking for your heart condition. You may simply give the prescription information directly from the bottles.

<u>Medication Name</u>	<u>Dose</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

- 5 14. What is the average monthly cost to you of all the medications you take for your heart problem? (Do not include any amount paid by insurance.)

\$ _____

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. IS CHARGED? \$ _____)

- 5 15. Have you been to the emergency room in the past 12 months due to your angina or other heart problems?

1 NO

2 YES



15a. How many times? _____

15b. What was the cost to you of your last emergency room visit? (Do not include any amount paid by insurance.)

\$ _____

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. WAS CHARGED? \$ _____)

- 5 16. Have you stayed overnight in a hospital in the last 12 months because of angina or other heart problems?

1 NO

2 YES→

Please list (starting with most recent stay):

Dates	Length of Stay	Cause/Treatment	Cost to You
_____	_____ days	_____	\$ _____
_____	_____ days	_____	\$ _____
_____	_____ days	_____	\$ _____

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. WAS CHARGED? MARK ANSWERS AFTER COST TO YOU.)

- 5 17. In the past 12 months, have you had any other medical treatment or been in any exercise program (including use of exercise equipment in your home) for your heart condition?

1 NO

2 YES→

Please give type of treatment and annual cost to you (do not include any amount paid by insurance). If it involves a one-time only purchase such as exercise equipment, please give the amount spent in the past year:

<u>Treatment</u>	<u>Cost to You in the Past Year</u>
_____	\$ _____
_____	\$ _____
_____	\$ _____

Lifestyle Changes and Related Expenditures

- 6 18. Which of the following things do you think sometimes bring on or aggravate your angina? (Circle all that apply)
- 1 COLD TEMPERATURE
 - 2 STRESS OR ANXIETY
 - 3 EXCITEMENT
 - 4 PHYSICAL EXERTION (SUCH AS WALKING FAST OR HEAVY LIFTING)
 - 5 AIR POLLUTION
 - 6 CIGARETTE SMOKE
 - 7 MEALS (PAIN AFTER MEALS OR AFTER CERTAIN FOODS OR BEVERAGES)
 - 8 OTHERS (please describe) _____

Which do you think is the most important factor? _____

- 6 19. What kinds of changes do you make in your activities on days when for any reason you feel you are more likely to have an angina episode? (Circle all that apply)
- 1 MAKE NO CHANGES IN ACTIVITIES
 - 2 AVOID ACTIVE RECREATIONAL ACTIVITIES
 - 3 AVOID PHYSICAL EXERTION SUCH AS HOUSEWORK OR YARDWORK
 - 4 SLEEP OR REST MORE
 - 5 TAKE TIME OFF FROM WORK
 - 6 STAY HOME
 - 7 DO THE SAME ACTIVITIES, BUT AT A SLOWER PACE
 - 8 AVOID EMOTIONAL STRESS
 - 9 AVOID EXPOSURE TO HOT OR COLD WEATHER
 - 10 AVOID EXPOSURE TO AIR POLLUTION
 - 11 AVOID EXPOSURE TO CIGARETTE SMOKE
 - 12 OTHER (please specify) _____

6 20. In the past 12 months, have you hired any help for yard work, home or auto maintenance, or housework to reduce or prevent angina or other problems related to your heart condition?

1 NO

2 YES

(INTERVIEWER: SKIP TO ALT-20, INTERVIEWER PAGE 12. SUBJECT DOES NOT HAVE ALT-20, BUT SEQUENCE AND RESPONSE CHOICES ARE VERY SIMILAR TO QUESTION 20)

6

20a. Please give an example of the type of help you hire most often. Consider only work that you would prefer to do yourself rather than have someone else do.

6

20b. How often do you hire help for this purpose?

_____ times per year

7

20c. On average, how much does this cost you?

\$ _____ per year

7

20d. If you did this work yourself for a year, do you believe you would probably have more frequent angina?

1 NO

2 YES

If you did this work yourself, how many additional angina episodes per year do you think you would get, over what you now get?

_____ additional episodes per year

7

20e. If you did this work yourself for a year, do you think the severity of your angina episodes after doing this work would be worse or be about the same as your current other angina episodes?

- 1 ABOUT THE SAME
- 2 WORSE →

Using our 1 to 7 scale, how severe do you think your angina episodes after doing this work would be?

- 1 NO DISCOMFORT
- 2 VERY MILD DISCOMFORT
- 3 MILD DISCOMFORT
- 4 MODERATE DISCOMFORT
- 5 MODERATELY SEVERE DISCOMFORT
- 6 SEVERE DISCOMFORT
- 7 VERY SEVERE DISCOMFORT

7

20f. If you did this work yourself for a year, do you believe this might increase your chances of having a heart attack?

- 1 NO
- 2 YES →

If you did this work for a year, how much do you think this would add to your chances of having a heart attack during the year?

- 1 ADD A SMALL AMOUNT (ADD LESS THAN 5%)
- 2 ADD A MODERATE AMOUNT (ADD 5-10%)
- 3 ADD A MODERATELY LARGE AMOUNT (ADD 11-25%)
- 4 ADD A LARGE AMOUNT (ADD MORE THAN 25%)
- 5 OTHER (please explain) _____

8

20g. Do you hire this help for any other reasons, in addition to possible concern about angina and heart attack risks?

- 1 NO
- 2 YES →

Please explain:

(INTERVIEWER: CHECK HERE TO MAKE SURE THEY WOULD PREFER TO DO THE WORK THEMSELVES)

8

20h. Please list any other examples of help you hire due to your heart condition. Please describe the type of help, for example help with housework or home maintenance, and estimate how many times in the past year you hired this help. Please do not include any help that you think you would hire even if you did not have any trouble with your heart.

<u>Type of Help</u>	<u>Times Hired</u>
_____	_____ in past year
_____	_____ in past year
_____	_____ in past year
_____	_____ in past year

8

20i. In the past year, have you purchased any special equipment or made structural changes in your home to reduce physical exertion that might aggravate your heart problem? Examples might be an electric garage door opener or the addition of a ground-floor bedroom.

1 NO

2 YES →

Please describe each expenditure and give the cost to you in the past year. Do not include any expenditures that you think you would have made even if you did not have any trouble with your heart.

<u>Type of Expenditure</u>	<u>Cost to You in Past Year</u>
_____	\$ _____
_____	\$ _____
_____	\$ _____

INTERVIEWER: SKIP TO QUESTION 21 (SUBJECT PAGE NO. 9) UNLESS ANSWER TO QUESTION 20 WAS NO.

ALT-20. In the past 12 months, have you purchased any special equipment or made structural changes in your home to reduce physical exertion that might aggravate your heart problem. Examples might be an electric garage door opener or the addition of a ground-floor bedroom.

1 NO

2 YES

SKIP TO QUESTION 21 (SUBJECT PAGE NO. 9)

ALT-20a. Please give an example of your largest purchase or expenditure of this type. Consider only purchases that you would not have made if you did not have any trouble with your heart.

ALT-20b. What was the cost to you of this purchase in the past year?

\$

ALT-20c. If you did the same work or activity for a year without using this equipment (or without making this change in your home), do you believe you would have more frequent angina?

1 NO

2 YES

If you did the same work or activity for a year without using this equipment or making these changes, how many additional angina episodes per year do you think you would get, over what you now get?

additional episodes per year

ALT-20d. If you did the same work or activity for a year without using this equipment (or without making this change in your home), do you believe the severity of any resulting angina episodes would be worse or be about the same as your current angina episodes?

- 1 ABOUT THE SAME
- 2 WORSE —————↓

Using our 1 to 7 scale, how severe do you think the resulting angina episodes would be?

(INTERVIEWER: ANSWER CHOICES ARE THE SAME AS UNDER QUESTION 20e--SUBJECT PAGE NO. 7)

- 1 NO DISCOMFORT
- 2 VERY MILD DISCOMFORT
- 3 MILD DISCOMFORT
- 4 MODERATE DISCOMFORT
- 5 MODERATELY SEVERE DISCOMFORT
- 6 SEVERE DISCOMFORT
- 7 VERY SEVERE DISCOMFORT

ALT-20e. If you did the same work or activity for a year without using this equipment (or without making this change in your home), do you believe this might increase your chances of having a heart attack?

- 1 NO
- 2 YES —————↓

Without using this equipment (or without making this change in your home) how much would this add to your chances of having a heart attack during the year?

(INTERVIEWER: ANSWER CHOICES ARE THE SAME AS UNDER QUESTION 20f--SUBJECT PAGE NO. 7)

- 1 ADD A SMALL AMOUNT (ADD LESS THAN 5%)
- 2 ADD A MODERATE AMOUNT (ADD 5-10%)
- 3 ADD A MODERATELY LARGE AMOUNT (ADD 11-25%)
- 4 ADD A LARGE AMOUNT (ADD MORE THAN 25%)
- 5 OTHER (please explain) _____

ALT-20f. Have you made this expenditure for any other reasons, in addition to possible concern about angina and heart attack risks?

1 NO

2 YES → Please explain:

ALT-20g. Please list any other examples of expenditures you have made in the past year for special equipment or structural changes in your home to reduce physical exertion due to your heart problem. Please describe each expenditure and give the cost to you in the past year. Do not include any expenditures that you would have made even if you did not have any trouble with your heart.

<u>Type of Expenditure</u>	<u>Cost to You in Past Year</u>
_____	\$ _____
_____	\$ _____
_____	\$ _____
_____	\$ _____

Employment

9 21. Are you employed?

- 1 NO
2 YES

INTERVIEWER: ASK ALT-21, INTERVIEWER PAGE 17.
IT IS NOT ON SUBJECT'S QUESTIONNAIRE

9

21a. What are your average total hours per week (all jobs)?

_____ hours per week

9

21b. What kind of work do you do (occupation)?

Job 1 _____

Job 2 _____

9

21c. How many days have you missed from work (all jobs) in the past year due to angina or other illness related to your heart

_____ days

9

21d. Do you have paid sick leave?

- 1 NO
2 YES

Does it cover all of the time you typically miss from work due to all types of illness?

- 1 NO
2 YES

Please estimate how many days you missed from work due to all types of illness in the past year that were not covered by sick leave.

_____ days

9

21e. Have you changed jobs in the past 5 years because of your heart condition?

- 1 NO
2 YES

Did the job change mean a reduction in income?

- 1 NO
2 YES

10

21f. Are you working fewer hours than you would like because of your heart condition?

1 NO

2 YES →

How many hours per week would you like to be working?

_____ hours per week

10

21g. Please indicate the category that represents how much you earn annually at your current job(s).

1 LESS THAN \$4,999

2 \$5,000 - \$9,999

3 \$10,000 - \$14,999

4 \$15,000 - \$19,999

5 \$20,000 - \$24,999

6 \$25,000 - \$29,999

7 \$30,000 - \$34,999

8 \$35,000 - \$39,999

9 \$40,000 - \$44,999

10 \$45,000 - \$49,999

11 \$50,000 - \$59,999

12 \$60,000 OR MORE

INTERVIEWER: ASK THE FOLLOWING ALTERNATIVE QUESTIONS IF SUBJECT IS NOT CURRENTLY EMPLOYED

ALT-21. If you are currently not employed, did you have to quit working at a paid job (or take an early retirement) in the past 5 years due to your heart problem?

- 1 NO
2 YES

SKIP TO QUESTION 22
(SUBJECT PAGE NO. 10)

ALT-21a. How long ago did you quit working?

_____ years ago

ALT-21b. What kind of work did you used to do (occupation)?

ALT-21c. Please indicate the category that represents how much you earned annually before you quit working.

(INTERVIEWER: ANSWER CHOICES ARE THE SAME AS UNDER QUESTION 21g--SUBJECT PAGE NO. 10)

- | | |
|-----------------------|------------------------|
| 1 LESS THAN \$4,999 | 7 \$30,000 - \$34,999 |
| 2 \$5,000 - \$9,999 | 8 \$35,000 - \$39,999 |
| 3 \$10,000 - \$14,999 | 9 \$40,000 - \$44,999 |
| 4 \$15,000 - \$19,999 | 10 \$45,000 - \$49,999 |
| 5 \$20,000 - \$24,999 | 11 \$50,000 - \$59,999 |
| 6 \$25,000 - \$29,999 | 12 \$60,000 OR MORE |

ALT-21d. Since you quit working, has your condition improved enough (due to bypass surgery or other treatment) that you believe you could return to work, but have been unable to return to work due to your health history?

- 1 NO
2 YES

III. IMPORTANCE OF CHANGES IN ANGINA

- 10 22. Please think of your most recent angina episode that you would say was typical. When did this occur?

(INTERVIEWER: IF EPISODE WAS WHEN THEY ANSWERED THE PHONE FOR THIS INTERVIEW, ASK THEM TO THINK OF ANOTHER RECENT EPISODE AND REPEAT QUESTION.)

- 10 23. Where were you?

- 10 24. What were you doing?

- 10 25. How long were you doing this activity?

_____ minutes

- 10 26. How long did the pain or discomfort last?

_____ minutes

- 11 27. What did you do after this typical angina episode began? (Check all that apply)

1 STOPPED FOR A WHILE AND RESTED. LATER RESUMED THE ACTIVITY.

How long did you rest before starting again? _____ mins.

2 STOPPED THE ACTIVITY ALTOGETHER.

3 CONTINUED AT THE SAME PACE.

4 SLOWED DOWN BUT DID NOT STOP.

5 TOOK NITROGLYCERIN OR OTHER MEDICATION.

6 OTHER, please describe: _____

Which of these was the most important means of relief for this particular episode? _____

11 28. Sometimes an angina episode may cause you some inconvenience, expense, or other effect on your life. Which of the following possible effects of this angina episode bothered you? (Check all that apply)

- 1 MEDICAL TREATMENT EXPENSES.
- 2 LOST INCOME.
- 3 NON-MEDICAL EXPENSES (SUCH AS PAYING FOR SERVICES).
- 4 PAIN AND DISCOMFORT.
- 5 LESS ABILITY TO WORK AT A JOB (FOR REASONS OTHER THAN INCOME).
- 6 LESS ABILITY TO DO DESIRED ACTIVITIES (RECREATION, CHORES, ETC.).
- 7 CONCERN TO YOU ABOUT POTENTIAL HEART ATTACK OR BYPASS SURGERY.
- 8 CONCERN TO YOU ABOUT WORRY OR INCONVENIENCE TO FAMILY AND FRIENDS DUE TO YOUR HEALTH.
- 9 OTHER, please explain _____

Which was most bothersome to you? _____

11 29. If there was any actual monetary cost to you due to this episode, can you estimate how much it was?

\$ _____

11 30a. If you could expect to have a similar typical angina episode tomorrow, but that it would be possible to avoid it by paying some amount of money, what is the most would you be willing to pay to avoid having this episode tomorrow?

\$ _____

(INTERVIEWER: IF SUBJECT RESPONDS \$0 OR REFUSES TO ANSWER, ASK THE FOLLOWING QUESTION, NOT ON SUBJECT'S VERSION. DO NOT PUSH FOR A DOLLAR ANSWER.)

Which of the following reasons best explains your answer to the previous question about how much you would pay to avoid a typical episode?

- 1 I DON'T BELIEVE I SHOULD HAVE TO PAY FOR SOMETHING LIKE THIS.
- 2 I CAN'T IMAGINE HOW AN ANGINA EPISODE COULD BE AVOIDED BY PAYING SOMETHING.
- 3 IT WOULD NOT BE WORTH ANYTHING TO ME TO AVOID ONE ANGINA EPISODE.
- 4 OTHER, please explain _____

(INTERVIEWER: IF SUBJECT REFUSED TO ANSWER 30a, DO NOT ASK 30b)

11 30b. If you could expect to have 2 such episodes in the next week, what is the most you would be willing to pay to avoid having both of them?

\$ _____

The interviewer will ask a few questions about other angina episodes you have had. Before the interviewer calls, you may wish to think about the worst angina episode you have had and about the mildest episodes you have had.

(INTERVIEWER: QUESTIONS 22b-28b CONCERN THE WORST EPISODE AND QUESTIONS 22c-28c CONCERN THE MILDEST EPISODE. THEY PARALLEL THE QUESTIONS FOR THE TYPICAL EPISODE. THEY ARE NOT ON SUBJECT'S VERSION.)

22b. Please think of the worst angina episode you have ever had. When did this occur?

23b. Where were you?

24b. What were you doing?

25b. How long were you doing this activity?

_____ minutes

26b. How long did the pain or discomfort last?

_____ minutes

27b. What did you do after this worst angina episode began? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 27, SUBJECT PAGE 11)

1 STOPPED FOR A WHILE AND RESTED. LATER RESUMED THE ACTIVITY.

How long did you rest before starting again? _____ mins.

2 STOPPED THE ACTIVITY ALTOGETHER.

3 CONTINUED AT THE SAME PACE.

4 SLOWED DOWN BUT DID NOT STOP.

5 TOOK NITROGLYCERIN OR OTHER MEDICATION.

6 OTHER, please describe: _____

Which of these was the most important means of relief for this particular episode? _____

28b. Sometimes an angina episode may cause you some inconvenience, expense, or other effect on your life. Which of the following possible effects of this worst angina episode bothered you? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 28, SUBJECT PAGE 11)

- 1 MEDICAL TREATMENT EXPENSES.
- 2 LOST INCOME.
- 3 NON-MEDICAL EXPENSES (SUCH AS PAYING FOR SERVICES).
- 4 PAIN AND DISCOMFORT.
- 5 LESS ABILITY TO WORK AT A JOB (FOR REASONS OTHER THAN INCOME).
- 6 LESS ABILITY TO DO DESIRED ACTIVITIES (RECREATION, CHORES, ETC.).
- 7 CONCERN TO YOU ABOUT POTENTIAL HEART ATTACK OR BYPASS SURGERY.
- 8 CONCERN TO YOU ABOUT WORRY OR INCONVENIENCE TO FAMILY AND FRIENDS DUE TO YOUR HEALTH.
- 9 OTHER, please explain _____

Which was most bothersome to you? _____

(INTERVIEWER: THIS MAY BE TOO DIFFICULT FOR THOSE WHO HAVEN'T HAD ANGINA FOR QUITE A WHILE. IF SO, SKIP AHEAD TO QUESTION 31, SUBJECT PAGE NO. 12.)

22c. Please think of a recent example of the mildest angina episodes you have. When did this occur?

23c. Where were you?

24c. What were you doing?

25c. How long were you doing this activity?

_____ minutes

26c. How long did the pain or discomfort last?

_____ minutes

27c. What did you do after this mild angina episode began? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 27,
SUBJECT PAGE 11)

- 1 STOPPED FOR A WHILE AND RESTED. LATER RESUMED THE ACTIVITY.
How long did you rest before starting again? _____ mins.
- 2 STOPPED THE ACTIVITY ALTOGETHER.
- 3 CONTINUED AT THE SAME PACE.
- 4 SLOWED DOWN BUT DID NOT STOP.
- 5 TOOK NITROGLYCERIN OR OTHER MEDICATION.
- 6 OTHER, please describe: _____

Which of these was the most important means of relief for this particular episode? _____

28c. Sometimes an angina episode may cause you some inconvenience, expense, or other effect on your life. Which of the following possible effects of this mild angina episode bothered you? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 28,
SUBJECT PAGE 11)

- 1 MEDICAL TREATMENT EXPENSES.
- 2 LOST INCOME.
- 3 NON-MEDICAL EXPENSES (SUCH AS PAYING FOR SERVICES).
- 4 PAIN AND DISCOMFORT.
- 5 LESS ABILITY TO WORK AT A JOB (FOR REASONS OTHER THAN INCOME).
- 6 LESS ABILITY TO DO DESIRED ACTIVITIES (RECREATION, CHORES, ETC.).
- 7 CONCERN TO YOU ABOUT POTENTIAL HEART ATTACK OR BYPASS SURGERY.
- 8 CONCERN TO YOU ABOUT WORRY OR INCONVENIENCE TO FAMILY AND FRIENDS DUE TO YOUR HEALTH.
- 9 OTHER, please explain _____

Which was most bothersome to you? _____

- 12 31. This question is about how you think you would be affected if your heart condition were to become worse, causing you to have angina pain or discomfort more often than you do now. We are interested in finding out how much the different effects of such a change in your condition would bother you, once you had done what you could to minimize the effects.

Listed below are some effects on your life that might occur if you were to have angina more often. For the effect that would be most bothersome to you, circle the number 10. For the effect that would be least bothersome to you, circle the number 1. For the remaining effects on the list, please circle the number that best describes how bothersome it would be relative to these extremes. You may circle the same number for more than one effect if they would be equally bothersome to you.

Effects you may experience if <u>your angina worsened</u>	Relative bothersomeness <u>of the effect</u>									
	<u>Least</u> <u>Bothersome</u>					<u>Most</u> <u>Bothersome</u>				
a. More medical treatment expenses.	1	2	3	4	5	6	7	8	9	10
b. Less ability to earn income.	1	2	3	4	5	6	7	8	9	10
c. More non-medical expenses (such as paying for services).	1	2	3	4	5	6	7	8	9	10
d. More pain or discomfort.	1	2	3	4	5	6	7	8	9	10
e. Less ability to work at a job (for reasons other than income).	1	2	3	4	5	6	7	8	9	10
f. Less ability to do desired activities (recreation, chores, or work).	1	2	3	4	5	6	7	8	9	10
g. More concern to you about potential heart attack or bypass surgery.	1	2	3	4	5	6	7	8	9	10
h. More concern to you about worry or inconvenience to family and friends due to your health.	1	2	3	4	5	6	7	8	9	10

- 13 32. Suppose your heart condition were to become worse so that with your current medical treatment and lifestyle your angina episodes would occur more often. Suppose also that a new medical treatment were available that could prevent the additional angina without causing undesirable side effects or requiring lifestyle changes.

If the treatment would prevent ____ additional angina episodes per month and if you had to pay the entire cost yourself, would you take the treatment if it cost \$ ____ each month?

- 1 NO
- 2 YES

Would you take the treatment if it cost \$ ____ each month?

- 1 NO
- 2 YES

Would you take the treatment if it cost \$ ____ each month?

- 1 NO
- 2 YES

- 13 33. What is the most that you would pay for this treatment if it would prevent ____ additional angina episodes per month?

\$ ____ per month

INTERVIEWER: IF ALL THE ANSWERS TO QUESTION 32 WERE NO,
OR THE ANSWER TO QUESTION 33 WAS \$0,
OR REFUSED TO ANSWER

ASK THE FOLLOWING QUESTION (NOT ON SUBJECT'S VERSION)

Which of the following reasons best explains your answer to the previous questions about how much you would pay for such a treatment?

- 1 I DON'T BELIEVE I SHOULD HAVE TO PAY FOR A NEW TREATMENT.
- 2 I DON'T BELIEVE THERE COULD BE ANY SUCH TREATMENT.
- 3 IT WOULD NOT BE WORTH PAYING ANYTHING FOR PREVENTING THAT MUCH ANGINA
- 4 OTHER (PLEASE EXPLAIN) _____

IV. HEART DISEASE HISTORY

13 34. Has a doctor ever said you had a heart attack?

1 NO

2 YES →

Please list dates starting with most recent (month and year is sufficient):

14 35. Has a doctor ever recommended you have coronary artery bypass surgery?

1 NO →

Has the doctor said why not?

2 YES →

Did you have the surgery?

1 NO → Why not?

2 YES → Please list dates (starting with most recent):

- 14 36. Have you ever had angioplasty to improve the blood flow to your heart tissue? (Angioplasty involves catheterization with a balloon catheter that expands narrowed coronary arteries.)

1 NO

2 YES →

Please list dates (starting with most recent):

Was blood flow improved?

1 NO

2 YES

- 14 37. Each time you have an angina episode, do you believe (Circle the best answer):

- 1 YOUR HEART MAY BE HARMED A SMALL AMOUNT AND PROBABLY DOES NOT HEAL?
- 2 YOUR HEART MAY BE HARMED A SMALL AMOUNT BUT PROBABLY DOES HEAL?
- 3 YOUR HEART IS PROBABLY NOT HARMED, THE ANGINA IS SIMPLY YOUR BODY'S WARNING TO SLOW DOWN?
- 4 OTHER (please explain) _____

- 15 38. Circle the number on the scale that best describes how often the statement has been true for you in the past few years.

a. I get as much exercise as my physical condition allows. NEVER.....ALWAYS
1 2 3 4 5 6 7

b. I exert myself physically until I begin to feel angina pain or discomfort. NEVER.....ALWAYS
1 2 3 4 5 6 7

c. I follow the diet recommendations of my doctor. NEVER.....ALWAYS
1 2 3 4 5 6 7

d. I watch my pulse rate during exercise or take my blood pressure at home. NEVER.....ALWAYS
1 2 3 4 5 6 7

e. I am under a lot of stress. NEVER.....ALWAYS
1 2 3 4 5 6 7

V. PERCEPTIONS ABOUT AIR POLLUTION

15 39. How do you usually tell when air pollution is high? (Circle all that apply)

- 1 DON'T USUALLY NOTICE AIR POLLUTION
- 2 SEE OR HEAR REPORTS IN THE NEWSPAPER, TV OR RADIO
- 3 SEE IT IN THE AIR
- 4 FEEL IT AFFECTING MY EYES OR LUNGS
- 5 SMELL IT
- 6 OTHER (please describe) _____

15 40. How often do you think there is enough air pollution in the areas where you live or work to affect your health or the health of others?

- 1 NEVER
- 2 LESS THAN 7 DAYS PER YEAR
- 3 7 TO 14 DAYS PER YEAR
- 4 14 TO 30 DAYS PER YEAR
- 5 30 TO 60 DAYS PER YEAR
- 6 MORE THAN 60 DAYS PER YEAR

15 41. (If you think air pollution sometimes aggravates your angina) On days when you are concerned that air pollution might affect your angina, what do you usually do? (Circle all that apply)

- 1 NOTHING DIFFERENT, KEEP TO MY USUAL ROUTINE
- 2 SPEND LESS TIME OUTDOORS
- 3 EXERCISE LESS
- 4 GO TO A LESS POLLUTED AREA OR PART OF TOWN
- 5 OTHER (please specify) _____
- 9 not applicable

in each of the following activities or locations:

Low
Pollution

High
Pollution

hour.	1	2	3	4	5
streets in normal traffic.	1	2	3	4	5
ways in normal traffic.	1	2	3	4	5
streets.	1	2	3	4	5
our home.	1	2	3	4	5
cs or other public places.	1	2	3	4	5
aurants, stores, or other	1	2	3	4	5
home.	1	2	3	4	5

ROUND QUESTIONS

he category that represents your household's
985) income, including any disability payments.

99	7	\$30,000 - \$34,999
9	8	\$35,000 - \$39,999
999	9	\$40,000 - \$44,999
999	10	\$45,000 - \$49,999
999	11	\$50,000 - \$59,999
999	12	\$60,000 OR MORE

few additional background questions.

G QUESTIONS DO NOT APPEAR ON THE SUBJECT'S

e last year of school that you completed.

10	9th GRADE
11	10th GRADE
12	11th GRADE
13	12th GRADE
14	FIRST YEAR OF COLLEGE
15	SECOND YEAR OF COLLEGE
16	THIRD YEAR OF COLLEGE
17	FOURTH YEAR OF COLLEGE
18	GRADUATE STUDIES

PERSONS

in your household?

inches

54. What is your national or ancestral origin?

- 1 WHITE, CAUCASIAN
- 2 ASIAN
- 3 HISPANIC
- 4 BLACK, AFRO-AMERICAN
- 5 OTHER (specify) _____

ANY ADDITIONAL COMMENTS?

DATE _____
SUBJECT _____
INTERVIEWER _____

SUPPLEMENTARY QUESTIONS ON CO EXPOSURE
CORONARY HEART DISEASE STUDY

Now that we are at the end of the questionnaire I'd like to ask you a few questions about factors of your lifestyle that may influence your exposure to an air pollutant, carbon monoxide.

1. Do you usually travel by auto, bus or foot?

- 1 personal auto
- 2 car pool
- 3 bus
- 4 walking
- 5 motorcycle
- 6 other

2. Do you travel to and from work or any other place at least three (3) times per week?

- 1 NO
- 2 YES

2a. How much time do you spend
traveling one way?

_____ minutes

3. How many hours do you spend in heavy traffic while traveling each week?

_____ hrs.

4. Are you frequently around running autos or gasoline powered engines on the job or at home (e.g., auto repair work at home)?

- 1 NO
- 2 YES

5. Do you regularly use lawn equipment powered by gasoline engines?

- 1 NO
- 2 YES

6. Is a garage attached to your home or within the building in which you live?

- 1 NO
- 2 YES _____

Are autos parked in the garage?

- 1 NO
- 2 YES

7. Do you have natural gas fuel appliances in your home?

- 1 NO —————>

INTERVIEWER PROBE: IS YOUR HOME ALL ELECTRIC?

- 1 NO
- 2 YES

- 2 YES

8. Do you use any of the following gas fueled appliances in your home?

- 1 gas heater
- 2 gas cooking stove or range
- 3 gas cooking oven
- 4 gas water heater
- 5 gas clothes dryer
- 6 gas or kerosene space heater
- 7 other gas appliance
- 8 other (please specify) _____

9. To your knowledge is each of these appliances vented to the outside?

- 1 NO
- 2 YES

10. Does your home have a fireplace?

- 1 NO
- 2 YES _____

INTERVIEWER PROBE: HOW MANY TIMES
PER MONTH DO YOU USE YOUR FIREPLACE
DURING THE WINTERTIME?

11. If you have a kitchen exhaust fan do you use it when cooking?

- 1 No, or almost never
- 2 Yes, at times
- 3 Yes, always
- 9 Not applicable

12. If you have a kitchen window, do you open it when cooking?

- 1 No, or almost never
- 2 Yes, at times
- 3 Yes, always
- 9 Not applicable

13. Do you have energy-saving insulation or weather stripping installed in your home?

- 1 NO
- 2 YES

14. What main type of heating system do you use in your home?
(Circle best answer.)

- 1 Central warm air furnace with ducts to individual rooms
- 2 Wall furnace
- 3 Floor furnace
- 4 Portable electric room heater (circulating or radiant)
- 5 Oil or kerosene space heaters
- 6 Fireplace or woodburning stove
- 7 Solar
- 8 No heating equipment, or other
- 9 Do not know

15. Do you notice drafts in your home?

- 1 No, never
- 2 Yes, but rarely
- 3 Yes, often (each day)

16. Is your home located near (within three (3) blocks) any of the following? (Circle all that apply.)

- 1 Busy roadway or intersection
- 2 Auto or truck maintenance area or garage
- 3 Site of open burning
- 4 Manufacturing plant or industry with heavy smoke emission or furnaces
- 5 Electricity or steam plant
- 6 Other (please specify) _____

17. How often are you around other who smoke?

- 1 Rarely
- 2 Frequently _____

Where?	1 on the job
	2 at home
	3 other (please specify)

INTERVIEWER: IF ANSWER TO QUESTION 48 WAS YES (PAGE 29 INTERVIEWER VERSION) ASK THE FOLLOWING QUESTION.

18. If smokers are present at home, how many?

Number of smokers _____

Approximate number of packs smoked within the home by all smokers during a typical week's time.

Appendix 3

**ECONOMIC ASPECTS OF RISK POSED BY CARBON
MONOXIDE**

CODEBOOK

**PROGRAM IN SOCIAL ECOLOGY
UNIVERSITY OF CALIFORNIA, IRVINE**

**EPA COOPERATIVE AGREEMENT
JULY 1986**

Revised December, 1986

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GENERAL CODING GUIDELINES

GENERAL CODES APPLIED TO ALL QUESTIONS

- 99 = Subject declined to answer.
- 9 = Missing data (e.g., interviewer omitted question).
- 5 = Subject did not know or could not remember.

If all responses within a question are blank, the question was not asked (e.g., line of questioning branched away).

OTHER CODING GUIDELINES

1. Rounding of values -- when the response was a range of values (e.g., time, money), the midpoint of the given range was coded. For example, if length of activity was given as "30-45 minutes", it was coded as 38 minutes. If the duration of angina pain was given as "2-3", it was rounded up to the nearest minute.
2. If the value given was less than 1, a default value of "1" was assigned.
3. Comments of the research subject and the interviewer are organized by question number and are recorded separately.
4. The "1 = No, 2 = Yes" and other numbered responses on the Interviewer Version of the questionnaire were preserved in the coding.

The subsequent section of the codebook contains the "Interviewer Version" of the questionnaire. In turn the coding scheme is presented with column number fields indicated and, as appropriate, coding information unique to each question. Medication, occupation, medical treatment, expenditure, activity, and microenvironment codes follow in later sections in the same numerical sequence as presented in the questionnaire.

Frequency + Means: First 50 Interviews
Missing Value Revision 11/24/86

SW

DATE _____

SUBJECT _____

INTERVIEWER VERSION

INTERVIEWER _____

CORONARY HEART DISEASE STUDY

QUESTIONNAIRE

I. CURRENT ANGINA STATUS

SUB.

P.#

1 1. Have you ever had angina related pain, discomfort, heaviness, or pressure in your chest (not caused by a cold or by an accident or injury)?

0 1 NO
50 2 YES

1 2. Do you (or did you) get this feeling when you walk uphill or hurry?

1 1 NO
49 2 YES

1 3. Do you (or did you) get this feeling when you walk at an ordinary pace on level ground?

20 1 NO
30 2 YES

1 4. Has a doctor ever said that you have angina?

3 1 NO
47 2 YES

Coronary heart disease patients sometimes have pressure or heaviness in their chests even if they do not report it as angina pain. In the following questions, references to angina pain and discomfort are meant to include such episodes of pressure or heaviness.

1 5. Do you still have angina pain or discomfort sometimes, or do you no longer have it?

7 1 NO LONGER HAVE IT
43 2 STILL HAVE IT SOMETIMES

INTERVIEWER: GO TO ALT-6

7 Subjects branched to previous angina experience.

(INTERVIEWER: THIS BLOCK OF QUESTIONS IS NOT ON THE SUBJECT'S VERSION, BUT SHOULD BE ASKED INSTEAD OF QUESTIONS 6-8 FOR THOSE WHO ANSWER 1 TO QUESTION 5)

ALT-6. If you no longer have angina pain or discomfort, did you formerly have angina pain or discomfort that has been stopped due to surgery, treatment, or due to some other reason?

☐ 1 NO ☐ 2 YES

INTERVIEWER: STOP INTERVIEW AND DISCUSS

ALT-6a. When was the last time you experienced angina?

10.9 years or months ago (Circle years or months)
(Range = 2-24 mo)

ALT-6b. What do you think stopped the angina? (Circle all that apply)

- ☒ 1 BYPASS SURGERY
☐ 2 MEDICATION
☐ 3 LIFESTYLE ADJUSTMENTS
☐ 4 ANGIOPLASTY
☒ 5 OTHER (please explain) _____

ALT-6c. How often did you have angina when you used to have it? (Circle best answer)

- ☒ 1 NEVER OCCURRED
☐ 2 LESS THAN ONCE A MONTH
☐ 3 ABOUT ONCE A MONTH
☐ 4 ABOUT TWICE A MONTH
☐ 5 ABOUT ONCE A WEEK
☒ 6 ABOUT 2 OR 3 TIMES A WEEK
☐ 7 ABOUT ONCE A DAY
☐ 8 ABOUT TWICE A DAY
☒ 9 3 TIMES A DAY OR MORE

ALT-6d. How uncomfortable or severe was your angina when you used to have it? (Circle best answer)

- ☒ 1 NO DISCOMFORT
☐ 2 VERY MILD DISCOMFORT
☒ 3 MILD DISCOMFORT
☐ 4 MODERATE DISCOMFORT
☒ 5 MODERATELY SEVERE DISCOMFORT
☐ 6 SEVERE DISCOMFORT
☐ 7 VERY SEVERE DISCOMFORT

SKIP TO QUESTION 9 (SUBJECT PAGE NO. 3)

43 Subjects entered this branch.

- 2 6. For each season, please check the box under the angina frequency level that best describes how often you usually have angina in that season.

Season

Level of Frequency

MEAN		1 NEVER OCCURS	2 LESS THAN ONCE A MONTH	3 ABOUT ONCE A MONTH	4 ABOUT TWICE A MONTH	5 ABOUT ONCE A WEEK	6 ABOUT 2 OR 3 TIMES A WEEK	7 ABOUT ONCE A DAY	8 ABOUT TWICE A DAY	9 3 TIMES A DAY OR MORE	
5.0	SUMMER (Jun-Aug)	3	4	3	8	4	10	5	2	3	1 missing or N/A
5.1	FALL (Sep-Nov)	1	5	6	4	6	9	5	3	3	1 missing or N/A
5.1	WINTER (Dec-Feb)	0	7	7	4	4	8	5	2	5	1 missing or N/A
4.9	SPRING (Mar-May)	2	7	4	7	3	8	4	3	4	1 missing or N/A

- 2 7. For each season, please check the box under the angina severity (discomfort) level that best describes how severe your angina tends to be in that season.

Season

Level of Discomfort (Severity)

MEAN		1 NONE	2 VERY MILD	3 MILD	4 MODERATE	5 MODERATELY SEVERE	6 SEVERE	7 VERY SEVERE
3.6	SUMMER (Jun-Aug)	2	6	10	14	9	2	0
3.7	FALL (Sep-Nov)	1	5	11	16	9	1	0
3.9	WINTER (Dec-Feb)	0	5	13	12	9	3	1
3.5	SPRING (Mar-May)	2	7	11	17	4	2	0

- 2 8. During the past 12 months, how many days has angina pain or discomfort kept you resting on the couch or chair or in bed for most of the day?

mean 15.35 days

(INTERVIEWER: IF SUBJECT INDICATES RECALL TROUBLE
ASK ABOUT PAST 3 MONTHS: _____ DAYS)

(Range = 0-365 days)

28 subjects = 1

II. ANGINA EPISODES: PREVENTION AND RESPONSE

Medical Care

3 9. Do you have medical insurance or participate in any program that pays part or all of your medical bills?

0 1 NO → Why not? _____

50 2 YES ↓

9a. Circle all that apply:

- 15 1 PRIVATE MEDICAL INSURANCE
- 39 2 VA BENEFITS
- 22 3 MEDICARE
- 3 4 HEALTH MAINTENANCE PROGRAM
- 0 5 OTHER (please specify) _____
- 7 6 MEDICAL

9b. What is the total monthly cost to you of this coverage (insurance premiums, membership fees)?

\$ 17.09 mean 23 Subjects = 0
1 Refused
Range = \$0 - \$84

9c. What percentage (or dollar amount) of your medical expenses for office visits, hospital services, and prescription medication are covered under this (these) program(s)?

(INTERVIEWER-ASK ABOUT DEDUCTIBLES AND FIXED FEES, IF APPLICABLE, AND CLEARLY MARK RESPONSES.)

doctor office
 visit..... 98.72 % Range 65% - 100%
44 = 100%; 2 missing; 1 refused

emergency room and
 hospital services
 (including surgery).. 99.48% Range 80% - 100%
46 = 100%; 1 missing; 1 refused

prescription
 medication..... 97.34 % Range 50% - 100%
42 Subjects = 100%
2 " = missing
1 " = refused

Deductible 2 subjects \$50 + \$1500

3 10. How far do you drive each way to see the doctor about your heart condition?

mean 13.68 miles Range = 1-45 miles

4 11. Do you go for regular checkups?

6 1 NO
44 2 YES

↓ 44 Subjects branched

11a. How often do you go for checkups?

mean 4.96 (INTERVIEWER MARK IN TIMES PER YEAR)
(Range = 1-17 per year)

11b. What is the average cost to you of a checkup?
(Do not include any amount paid by insurance.)

mean \$ 7.21 35 subjects = \$0.
Range = \$0 - \$80.

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. IS CHARGED? \$ *35) * 1 subject = \$35.00
2 didn't know
47 no answer

4 12. How many times in the past 12 months have you visited the doctor's office because of angina or other heart problems (in addition to any regular checkups)?

mean 2.24 doctor's office visits

25 Subjects = 0
Range = 0-18

25 Subjects
branched
into this
group.

(If more than 0) What was the cost to you of your last office visit due to angina or other heart problems? (Do not include any amount paid by insurance.)

\$ * 205 * 1 Subject = \$205
2 Subjects = Don't know
20 Subjects = 0

2 Subjects = missing
or N/A

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. WAS CHARGED? \$ *477) * 1 Subject \$477
1 Don't know

- | Medication Name | # of Dosages
per 50 mg | Dose |
|-----------------|---------------------------|------|
|-----------------|---------------------------|------|

5 14. What is the average monthly cost to you of all the medications you take for your heart problem? (Do not include any amount paid by insurance.) *35 Subunits = \$0*

35 Subjects = \$0
1 Subject = Don't Know
Range = \$1 - \$120.

5 15. Have you been to the emergency room in the past 12 months due to your angina or other heart problems?

13 Subjects
branched

15a. How many times? 1.69 mean Range = 1-5

15b. What was the cost to you of your last emergency room visit? (Do not include any amount paid by insurance.)

S O

12 Subjects	= $\frac{1}{2}$
1 "	= Don't Know

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. WAS CHARGED? \$ * 77) 1 Subject = \$77

- 5 16. Have you stayed overnight in a hospital in the last 12 months because of angina or other heart problems?

35 1 NO

15 2 YES →

Please list (starting with most recent stay):

Dates	Length of Stay	Cause/Treatment	Cost to You	Cost to Insur
(15 subjects)	2-21 days	(Range \$380-1000) 8.2 mean (days) 12 = \$0; 1 = Don't know	→ 98.57 mean	\$40K me 15K, 45K, .
(1 subject)	21 days		\$ Don't know	
	days		\$	

(INTERVIEWER PROBE: DO YOU KNOW HOW MUCH YOUR INSURANCE CO. WAS CHARGED? MARK ANSWERS AFTER COST TO YOU.)

- 5 17. In the past 12 months, have you had any other medical treatment or been in any exercise program (including use of exercise equipment in your home) for your heart condition?

40 1 NO

10 2 YES →

Please give type of treatment and annual cost to you (do not include any amount paid by insurance). If it involves a one-time only purchase such as exercise equipment, please give the amount spent in the past year:

Treatment	Cost to You in the Past Year
10 Subjects	\$ 108. ⁰⁰ mean (Range = \$0 - \$400)
3 Subjects	\$ 16. ⁰⁰ mean (Range = \$0 - \$48)
0	\$

Lifestyle Changes and Related Expenditures

- 6 18. Which of the following things do you think sometimes bring on or aggravate your angina? (Circle all that apply)

- 22 1 COLD TEMPERATURE
42 2 STRESS OR ANXIETY
24 3 EXCITEMENT
42 4 PHYSICAL EXERTION (SUCH AS WALKING FAST OR HEAVY LIFTING)
19 5 AIR POLLUTION
10 6 CIGARETTE SMOKE
15 7 MEALS (PAIN AFTER MEALS OR AFTER CERTAIN FOODS OR BEVERAGES)
6 8 OTHERS (please describe) _____

Which do you think is the most important factor?

1 = 2 subjects
2 = 21 "
4 = 23 "
5 = 2 "
7 = 1 "

1 missin
or N/A

- 6 19. What kinds of changes do you make in your activities on days when for any reason you feel you are more likely to have an angina episode? (Circle all that apply)

- 9 1 MAKE NO CHANGES IN ACTIVITIES
15 2 AVOID ACTIVE RECREATIONAL ACTIVITIES
27 3 AVOID PHYSICAL EXERTION SUCH AS HOUSEWORK OR YARDWORK
23 4 SLEEP OR REST MORE
5 5 TAKE TIME OFF FROM WORK
20 6 STAY HOME
17 7 DO THE SAME ACTIVITIES, BUT AT A SLOWER PACE
22 8 AVOID EMOTIONAL STRESS
14 9 AVOID EXPOSURE TO HOT OR COLD WEATHER
13 10 AVOID EXPOSURE TO AIR POLLUTION
9 11 AVOID EXPOSURE TO CIGARETTE SMOKE
6 12 OTHER (please specify) _____

6 20. In the past 12 months, have you hired any help for yard work, home or auto maintenance, or housework to reduce or prevent angina or other problems related to your heart condition?

31 1 NO
19 2 YES

(INTERVIEWER: SKIP TO ALT-20, INTERVIEWER PAGE 12. SUBJECT DOES NOT HAVE ALT-20, BUT SEQUENCE AND RESPONSE CHOICES ARE VERY SIMILAR TO QUESTION 20)

6 20a. Please give an example of the type of help you hire most often. Consider only work that you would prefer to do yourself rather than have someone else do.

19 subjects branched to this question*

6 20b. How often do you hire help for this purpose?

mean 19.16 times per year Range = 1-52 times per yr

7 20c. On average, how much does this cost you?

mean \$ 637.79 per year Range = \$84 - \$2700. per yr.

7 20d. If you did this work yourself for a year, do you believe you would probably have more frequent angina?

1 1 NO
18 2 YES

If you did this work yourself, how many additional angina episodes per year do you think you would get, over what you now get?

mean 33.429 additional episodes per year
(Range 3-100)

\$19.10/episode

3 Subjects = don't know
1 Subject = ∞
1 Subject = missing

* Code	Freq.	Job
011	1	Main job
128	1	work around house
139	7	Yardwork
161	2	Household repairs
163	2	Routine car care
167	6	Care maintenance

19 subjects are in this branch

7

20e. If you did this work yourself for a year, do you think the severity of your angina episodes after doing this work would be worse or be about the same as your current other angina episodes?

2 1 ABOUT THE SAME
16 2 WORSE

1 Subject = Don't know

Using our 1 to 7 scale, how severe do you think your angina episodes after doing this work would be?

- 0 1 NO DISCOMFORT
- 0 2 VERY MILD DISCOMFORT
- 0 3 MILD DISCOMFORT
- 3 4 MODERATE DISCOMFORT
- 2 5 MODERATELY SEVERE DISCOMFORT
- 5 6 SEVERE DISCOMFORT
- 6 7 VERY SEVERE DISCOMFORT

7

20f. If you did this work yourself for a year, do you believe this might increase your chances of having a heart attack?

1 1 NO
17 2 YES →

1 Subject = Don't know

If you did this work for a year, how much do you think this would add to your chances of having a heart attack during the year?

- 2 1 ADD A SMALL AMOUNT (ADD LESS THAN 5%)
- 1 2 ADD A MODERATE AMOUNT (ADD 5-10%)
- 2 3 ADD A MODERATELY LARGE AMOUNT (ADD 11-25%)
- 11 4 ADD A LARGE AMOUNT (ADD MORE THAN 25%)
- 1 5 OTHER (please explain) _____

8

20g. Do you hire this help for any other reasons, in addition to possible concern about angina and heart attack risks?

15 1 NO
4 2 YES →

Please explain:

(INTERVIEWER: CHECK HERE TO MAKE SURE THEY WOULD PREFER TO DO THE WORK THEMSELVES)

19 subjects in this branch

8

20h. Please list any other examples of help you hire due to your heart condition. Please describe the type of help, for example help with housework or home maintenance, and estimate how many times in the past year you hired this help. Please do not include any help that you think you would hire even if you did not have any trouble with your heart.

Type of Help

Times Hired

12 Subjects

Range = 1-150 times/yr mean 26.1 in past year

7 Subjects

Range = 1-12 times/yr mean 4.29 in past year

3 "

Range = 1-6 times/yr mean 3.67 in past year

1 "

Range = 3 times/yr mean 3.0 in past year

8

20i. In the past year, have you purchased any special equipment or made structural changes in your home to reduce physical exertion that might aggravate your heart problem? Examples might be an electric garage door opener or the addition of a ground-floor bedroom.

15 1 NO

4 2 YES →

Please describe each expenditure and give the cost to you in the past year. Do not include any expenditures that you think you would have made even if you did not have any trouble with your heart.

Type of Expenditure
Code

Cost to You
in Past Year

4 subjects

104, 108, 110, 120

mean \$ 2,882.⁵⁰

Range = \$200-\$10

2 subjects

109, 131

mean \$ 34.⁵⁰

Range = \$28-40

1 subject

132

mean \$ 1,003.⁰⁰

31 Subjects branched to this question from Q20.

INTERVIEWER: SKIP TO QUESTION 21 (SUBJECT PAGE NO. 9) UNLESS ANSWER TO QUESTION 20 WAS NO.

ALT-20. In the past 12 months, have you purchased any special equipment or made structural changes in your home to reduce physical exertion that might aggravate your heart problem. Examples might be an electric garage door opener or the addition of a ground-floor bedroom.

29 1 NO → SKIP TO QUESTION 21 (SUBJECT PAGE NO. 9)
2 2 YES ↓

2 Subjects branched to answer Alt. Q 20

ALT-20a. Please give an example of your largest purchase or expenditure of this type. Consider only purchases that you would not have made if you did not have any trouble with your heart.

101, 111 (lawn mower, mattress)

ALT-20b. What was the cost to you of this purchase in the past year?

mean \$270.⁰⁰ (Range \$140 - 400)

ALT-20c. If you did the same work or activity for a year without using this equipment (or without making this change in your home), do you believe you would have more frequent angina?

1 NO
2 YES →

If you did the same work or activity for a year without using this equipment or making these changes, how many additional angina episodes per year do you think you would get, over what you now get?

mean 14.5 additional episodes per year Range = 3-26 episodes/y

2 subjects branched to this question.

ALT-20d. If you did the same work or activity for a year without using this equipment (or without making this change in your home), do you believe the severity of any resulting angina episodes would be worse or be about the same as your current angina episodes?

- ✓ 1 ABOUT THE SAME
2 2 WORSE ————— ↓

Using our 1 to 7 scale, how severe do you think the resulting angina episodes would be?

(INTERVIEWER: ANSWER CHOICES ARE THE SAME AS UNDER QUESTION 20e—SUBJECT PAGE NO. 7)

- ✓ 1 NO DISCOMFORT
✓ 2 VERY MILD DISCOMFORT
✓ 3 MILD DISCOMFORT
/ 4 MODERATE DISCOMFORT
✓ 5 MODERATELY SEVERE DISCOMFORT
/ 6 SEVERE DISCOMFORT
✓ 7 VERY SEVERE DISCOMFORT

ALT-20e. If you did the same work or activity for a year without using this equipment (or without making this change in your home), do you believe this might increase your chances of having a heart attack?

- ✓ 1 NO
2 2 YES ————— ↓

Without using this equipment (or without making this change in your home) how much would this add to your chances of having a heart attack during the year?

(INTERVIEWER: ANSWER CHOICES ARE THE SAME AS UNDER QUESTION 20f--SUBJECT PAGE NO. 7)

- ✓ 1 ADD A SMALL AMOUNT (ADD LESS THAN 5%)
/ 2 ADD A MODERATE AMOUNT (ADD 5-10%)
✓ 3 ADD A MODERATELY LARGE AMOUNT (ADD 11-25%)
/ 4 ADD A LARGE AMOUNT (ADD MORE THAN 25%)
✓ 5 OTHER (please explain) _____

ALT-20f. Have you made this expenditure for any other reasons, in addition to possible concern about angina and heart attack risks?

☒ 1 NO

☒ 2 YES → Please explain:

ALT-20g. Please list any other examples of expenditures you have made in the past year for special equipment or structural changes in your home to reduce physical exertion due to your heart problem. Please describe each expenditure and give the cost to you in the past year. Do not include any expenditures that you would have made even if you did not have any trouble with your heart.

<u>Type of Expenditure</u>	<u>Cost to You in Past Year</u>
<u>107, 120</u>	<u>mean \$ 5850. Range = \$700 - \$11K</u>
<u>112</u>	<u>mean \$ 350.</u>
<u>— 0 —</u>	<u>\$ —</u>
<u>— 0 —</u>	<u>\$ —</u>

Employment

9 21. Are you employed?

35 1 NO
15 2 YES

INTERVIEWER: ASK ALT-21, INTERVIEWER PAGE 17.
IT IS NOT ON SUBJECT'S QUESTIONNAIRE

↓ 15 branched to this question

9 21a. What are your average total hours per week (all jobs)?

mean 35 hours per week Range 10-70 hrs/week

9 21b. What kind of work do you do (occupation)?

Job 1 _____

Job 2 _____

9 21c. How many days have you missed from work (all jobs) in the past year due to angina or other illness related to your heart

mean 4.13 days Range 0-20 days/yr. 9 Subjects = 0

9 21d. Do you have paid sick leave?

// 1 NO

4 2 YES →

Does it cover all of the time you typically miss from work due to all types of illness?

2

1 NO →

2

2 YES

Please estimate how many days you missed from work due to all types of illness in the past year that were not covered by sick leave.

5.5

mean

_____ days Range 3-8*

9 21e. Have you changed jobs in the past 5 years because of your heart condition?

14 1 NO

1 2 YES →

Did the job change mean a reduction in income?

0 1 NO

1 2 YES

* 1 Subject stated 0 days specifically.

15 branched to this question

10

21f. Are you working fewer hours than you would like because of your heart condition?

9 1 NO

6 2 YES →

How many hours per week would you like to be working?

mean 39.6 hours per week Range 25-49

10

21g. Please indicate the category that represents how much you earn annually at your current job(s).

4 1 LESS THAN \$4,999

1 7 \$30,000 - \$34,999

3 2 \$5,000 - \$9,999

2 8 \$35,000 - \$39,999

0 3 \$10,000 - \$14,999

0 9 \$40,000 - \$44,999

0 4 \$15,000 - \$19,999

0 10 \$45,000 - \$49,999

2 5 \$20,000 - \$24,999

0 11 \$50,000 - \$59,999

0 6 \$25,000 - \$29,999

1 12 \$60,000 OR MORE

2 Refused to answer
0

mean = \$19,231

35 Subjects branched into this question.

INTERVIEWER: ASK THE FOLLOWING ALTERNATIVE QUESTIONS IF SUBJECT IS NOT CURRENTLY EMPLOYED

ALT-21. If you are currently not employed, did you have to quit working at a paid job (or take an early retirement) in the past 5 years due to your heart problem?

22 1 NO

13 2 YES

→ SKIP TO QUESTION 22
(SUBJECT PAGE NO. 10)

13 branched to this series

ALT-21a. How long ago did you quit working?

2.77 years ago

Range = 1-4 yrs

ALT-21b. What kind of work did you used to do (occupation)?

ALT-21c. Please indicate the category that represents how much you earned annually before you quit working.

(INTERVIEWER: ANSWER CHOICES ARE THE SAME AS UNDER QUESTION 21g—SUBJECT PAGE NO. 10)

/ 1 LESS THAN \$4,999	3 7 \$30,000 - \$34,999
/ 2 \$5,000 - \$9,999	/ 8 \$35,000 - \$39,999
/ 3 \$10,000 - \$14,999	/ 9 \$40,000 - \$44,999
/ 4 \$15,000 - \$19,999	/ 10 \$45,000 - \$49,999
Ø 5 \$20,000 - \$24,999	/ 11 \$50,000 - \$59,999
Ø 6 \$25,000 - \$29,999	2 12 \$60,000 OR MORE

mean = \$34,615

ALT-21d. Since you quit working, has your condition improved enough (due to bypass surgery or other treatment) that you believe you could return to work, but have been unable to return to work due to your health history?

9 1 NO

4 2 YES

III. IMPORTANCE OF CHANGES IN ANGINA

- 10 22. Please think of your most recent angina episode that you would say was typical. When did this occur?

mean 108.14 days ago. (Range 1-1,275 days)

(INTERVIEWER: IF EPISODE WAS WHEN THEY ANSWERED THE PHONE FOR THIS INTERVIEW, ASK THEM TO THINK OF ANOTHER RECENT EPISODE AND REPEAT QUESTION.)

- 10 23. Where were you?

- 10 24. What were you doing?

- 10 25. How long were you doing this activity?

mean 33.75 minutes (Range 1-360 min) 2 missing or don't rem

- 10 26. How long did the pain or discomfort last?

mean 31.92 minutes (Range 1-999 min) 1 don't remember

- 11 27. What did you do after this typical angina episode began? (Check all that apply)

28 1 STOPPED FOR A WHILE AND RESTED. LATER RESUMED THE ACTIVITY.

How long did you rest before starting again? _____ mins. 26.93 mean

11 2 STOPPED THE ACTIVITY ALTOGETHER.

Range 1-300 min

1 3 CONTINUED AT THE SAME PACE.

4 4 SLOWED DOWN BUT DID NOT STOP.

31 5 TOOK NITROGLYCERIN OR OTHER MEDICATION.

7 6 OTHER, please describe: _____

1 7 HOSPITAL

Which of these was the most important means of relief for this particular episode? _____

Code # of Sub

1 _____ 15

2 _____ 4

3 _____ 1

4 _____ 4

-18- 5 _____ 20

2 Don't know

- 11 28. Sometimes an angina episode may cause you some inconvenience, expense, or other effect on your life. Which of the following possible effects of this angina episode bothered you? (Check all that apply)

- 4 1 MEDICAL TREATMENT EXPENSES.
 10 2 LOST INCOME.
 4 3 NON-MEDICAL EXPENSES (SUCH AS PAYING FOR SERVICES).
 33 4 PAIN AND DISCOMFORT.
 15 5 LESS ABILITY TO WORK AT A JOB (FOR REASONS OTHER THAN INCOME).
 32 6 LESS ABILITY TO DO DESIRED ACTIVITIES (RECREATION, CHORES, ETC.).
 18 7 CONCERN TO YOU ABOUT POTENTIAL HEART ATTACK OR BYPASS SURGERY.
 24 8 CONCERN TO YOU ABOUT WORRY OR INCONVENIENCE TO FAMILY AND FRIENDS DUE TO YOUR HEALTH.
 9 9 OTHER, please explain _____

2 10 None

Which was most bothersome to you? _____

2 = 2 subject

4 = 17 "

5 = 3 "

6 = 9 "

7 = 7 "

8 = 5 subjects

9 = 6 subjects

1 missing or Don't know

- 11 29. If there was any actual monetary cost to you due to this episode, can you estimate how much it was?

\$ 2,001.12 mean \$0 = 48 subject
 \$5 = 1
 100K = 1

- 11 30a. If you could expect to have a similar typical angina episode tomorrow, but that it would be possible to avoid it by paying some amount of money, what is the most would you be willing to pay to avoid having this episode tomorrow?

mean \$ 1,952.38 Range \$0-\$60K 20 subject = \$
 2 = refused
 4 = \$

(N=37)

(INTERVIEWER: IF SUBJECT RESPONDS \$0 OR REFUSES TO ANSWER, ASK THE FOLLOWING QUESTION, NOT ON SUBJECT'S VERSION. DO NOT PUSH FOR A DOLLAR ANSWER.)

Which of the following reasons best explains your answer to the previous question about how much you would pay to avoid a typical episode?

- 4 1 I DON'T BELIEVE I SHOULD HAVE TO PAY FOR SOMETHING LIKE THIS.
 17 2 I CAN'T IMAGINE HOW AN ANGINA EPISODE COULD BE AVOIDED BY PAYING SOMETHING.
 5 3 IT WOULD NOT BE WORTH ANYTHING TO ME TO AVOID ONE ANGINA EPISODE.
 24 4 OTHER, please explain _____

(INTERVIEWER: IF SUBJECT REFUSED TO ANSWER 30a, DO NOT ASK 30b)

34 Subjects asked this question

- 11 30b. If you could expect to have such episodes in the next week, what is the most you would be willing to pay to avoid having both of them?

\$ 5,568.12 Range \$0-\$100K 8 subject = \$0
 2 subject = refused
 4 = \$

(N=24)

The interviewer will ask a few questions about other angina episodes you have had. Before the interviewer calls, you may wish to think about the worst angina episode you have had and about the mildest episodes you have had.

(INTERVIEWER: QUESTIONS 22b-28b CONCERN THE WORST EPISODE AND QUESTIONS 22c-28c CONCERN THE MILDEST EPISODE. THEY PARALLEL THE QUESTIONS FOR THE TYPICAL EPISODE. THEY ARE NOT ON SUBJECT'S VERSION.)

22b. Please think of the worst angina episode you have ever had. When did this occur?

1,171 mean
N = 47

Range = 1-9999

23b. Where were you?

24b. What were you doing?

25b. How long were you doing this activity?

110.5 minutes Range 1-960

26b. How long did the pain or discomfort last?

142.94 minutes Range 1-999

27b. What did you do after this worst angina episode began? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 27, SUBJECT PAGE 11)

- 7 1 STOPPED FOR A WHILE AND RESTED. LATER RESUMED THE ACTIVITY. *Range 10-60*
How long did you rest before starting again? _____ mins.
19 2 STOPPED THE ACTIVITY ALTOGETHER.
0 3 CONTINUED AT THE SAME PACE.
2 4 SLOWED DOWN BUT DID NOT STOP.
21 5 TOOK NITROGLYCERIN OR OTHER MEDICATION.
6 6 OTHER, please describe: _____
20 7 HOSPITAL

Which of these was the most important means of relief for this particular episode? _____

1 = 3 subjects
2 = 8 "
4 = 2 "
5 = 11 subjects
6 = 3 subjects
7 = 19 "

28b. Sometimes an angina episode may cause you some inconvenience, expense, or other effect on your life. Which of the following possible effects of this worst angina episode bothered you? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 28, SUBJECT PAGE 11)

8	1	MEDICAL TREATMENT EXPENSES.	
6	2	LOST INCOME.	
2	3	NON-MEDICAL EXPENSES (SUCH AS PAYING FOR SERVICES).	
32	4	PAIN AND DISCOMFORT.	
10	5	LESS ABILITY TO WORK AT A JOB (FOR REASONS OTHER THAN INCOME).	
16	6	LESS ABILITY TO DO DESIRED ACTIVITIES (RECREATION, CHORES, ETC.).	
23	7	CONCERN TO YOU ABOUT POTENTIAL HEART ATTACK OR BYPASS SURGERY.	
18	8	CONCERN TO YOU ABOUT WORRY OR INCONVENIENCE TO FAMILY AND FRIENDS DUE TO YOUR HEALTH.	
9	9	OTHER, please explain _____	(2 = 2 subjects 4 = 17 " ")
0	10	NONE _____	5 = 2 " 6 = 1 subject

Which was most bothersome to you? _____	(7 = 13 subjects 8 = 5 subjects 9 = 4 subjects)
---	---

(INTERVIEWER: THIS MAY BE TOO DIFFICULT FOR THOSE WHO HAVEN'T HAD ANGINA FOR QUITE A WHILE. IF SO, SKIP AHEAD TO QUESTION 31, SUBJECT PAGE NO. 12.)

22c. Please think of a recent example of the mildest angina episodes you have. When did this occur?

mean = 56 days Range 1-1095 23 subjects = missing or N/A
(N=27)

23c. Where were you?

24c. What were you doing?

25c. How long were you doing this activity?

mean 69.68 minutes Range 1-480 min

26c. How long did the pain or discomfort last?

mean 6.1 minutes Range 1-60 min 14 subjects = missing or N/A

27c. What did you do after this mild angina episode began? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 27,
SUBJECT PAGE 11)

- 15 1 STOPPED FOR A WHILE AND RESTED. LATER RESUMED THE ACTIVITY. *Range 1-6*
How long did you rest before starting again? 11 67 mins.
6 2 STOPPED THE ACTIVITY ALTOGETHER.
4 3 CONTINUED AT THE SAME PACE.
9 4 SLOWED DOWN BUT DID NOT STOP.
17 5 TOOK NITROGLYCERIN OR OTHER MEDICATION.
6 6 OTHER, please describe: _____
0 7 HOSPITAL _____

Which of these was the most important means of relief for this particular episode? _____

*1 = 7 subjects 5 = 14 subjects
2 = 5 " 6 = 3 subject
3 = 2 "
4 = 8 "*

28c. Sometimes an angina episode may cause you some inconvenience, expense, or other effect on your life. Which of the following possible effects of this mild angina episode bothered you? (Check all that apply)

(INTERVIEWER: RESPONSES ARE THE SAME AS FOR QUESTION 28,
SUBJECT PAGE 11)

- 0 1 MEDICAL TREATMENT EXPENSES.
2 2 LOST INCOME.
1 3 NON-MEDICAL EXPENSES (SUCH AS PAYING FOR SERVICES).
19 4 PAIN AND DISCOMFORT.
4 5 LESS ABILITY TO WORK AT A JOB (FOR REASONS OTHER THAN INCOME).
16 6 LESS ABILITY TO DO DESIRED ACTIVITIES (RECREATION, CHORES, ETC.).
4 7 CONCERN TO YOU ABOUT POTENTIAL HEART ATTACK OR BYPASS SURGERY.
7 8 CONCERN TO YOU ABOUT WORRY OR INCONVENIENCE TO FAMILY AND FRIENDS DUE TO YOUR HEALTH.
10 9 OTHER, please explain _____
5 10 NONE

Which was most bothersome to you? _____

*4 = 12 subjects
5 = 3 "
6 = 6 "
7 = 2 "
8 = 4 "
9 = 9 "*

- 12 31. This question is about how you think you would be affected if your heart condition were to become worse, causing you to have angina pain or discomfort more often than you do now. We are interested in finding out how much the different effects of such a change in your condition would bother you, once you had done what you could to minimize the effects.

Listed below are some effects on your life that might occur if you were to have angina more often. For the effect that would be most bothersome to you, circle the number 10. For the effect that would be least bothersome to you, circle the number 1. For the remaining effects on the list, please circle the number that best describes how bothersome it would be relative to these extremes. You may circle the same number for more than one effect if they would be equally bothersome to you.

Effects you may experience if <u>your angina worsened</u>	Relative bothersomeness <u>of the effect</u>										<u>Not APPLI</u>	<u>MEAN</u>
	<u>Least Bothersome</u>					<u>Most Bothersome</u>						
a. More medical treatment expenses.	1 27	2 2	3 2	4 1	5 5	6 2	7 3	8 1	9 3	10 3	1	3.35
b. Less ability to earn income.	1 18	2 2	3 1	4 1	5 2	6 1	7 2	8 1	9 5	10 5	12	4.26
c. More non-medical expenses (such as paying for services).	1 18	2 3	3 4	4 3	5 4	6 4	7 4	8 4	9 3	10 2	1	4.06
d. More pain or discomfort.	1 1	2 0	3 3	4 1	5 5	6 6	7 4	8 3	9 5	10 22		7.84
e. Less ability to work at a job (for reasons other than income).	1 6	2 1	3 1	4 2	5 2	6 5	7 2	8 5	9 4	10 11	11	6.64
f. Less ability to do desired activities (recreation, chores, or work).	1 1	2 1	3 0	4 0	5 5	6 6	7 3	8 7	9 8	10 19		8.06
g. More concern to you about potential heart attack or bypass surgery.	1 3	2 1	3 6	4 3	5 3	6 5	7 1	8 3	9 5	10 20		7.12
h. More concern to you about worry or inconvenience to family and friends due to your health.	1 5	2 0	3 4	4 0	5 3	6 1	7 2	8 10	9 9	10 16		7.46

- 13 32. Suppose your heart condition were to become worse so that with your current medical treatment and lifestyle your angina episodes would occur more often. Suppose also that a new medical treatment were available that could prevent the additional angina without causing undesirable side effects or requiring lifestyle changes.

If the treatment would prevent ____ additional angina episodes per month and if you had to pay the entire cost yourself, would you take the treatment if it cost \$ ____ each month?

6 1 NO
42 2 YES

1 Refused;
1 Don't know

Would you take the treatment if it cost \$ ____ each month?

// 1 NO
31 2 YES

1 Don't know

Would you take the treatment if it cost \$ ____ each month?

// 1 NO
20 2 YES

1 Don't know

- 13 33. What is the most that you would pay for this treatment if it would prevent ____ additional angina episodes per month?

\$ 215.50 per month

Range \$0-2000
1 subject = \$0

1 Refused
7 2
1 Don't know
1 Non-zero amt.

INTERVIEWER: IF ALL THE ANSWERS TO QUESTION 32 WERE NO,
OR THE ANSWER TO QUESTION 33 WAS \$0,
OR REFUSED TO ANSWER

ASK THE FOLLOWING QUESTION (NOT ON SUBJECT'S VERSION)

Which of the following reasons best explains your answer to the previous questions about how much you would pay for such a treatment?

- Ø 1 I DON'T BELIEVE I SHOULD HAVE TO PAY FOR A NEW TREATMENT.
Ø 2 I DON'T BELIEVE THERE COULD BE ANY SUCH TREATMENT.
3 3 IT WOULD NOT BE WORTH PAYING ANYTHING FOR PREVENTING THAT MUCH ANGINA
7 4 OTHER (PLEASE EXPLAIN) _____

IV. HEART DISEASE HISTORY

13 34. Has a doctor ever said you had a heart attack?

16 1 NO

34 2 YES →

Please list dates starting with most recent (month and year is sufficient):

'86 = 3 subject

'85 = 4 subject

'84 = 11 subject

'83 = 5 subject

'82 = 4 subject

'81 = 2 " "

'80 = 1

'79 = 2

Most recent MI dates

#2 MI from yr '58-85

#3 MI " " '68-84

#4 MI " " '70-84

#5 MI " " '69-82

14 35. Has a doctor ever recommended you have coronary artery bypass surgery?

17 1 NO →

Has the doctor said why not?

33 2 YES →

Did you have the surgery?

101 NO →

Why not?

23 2 YES →

Please list dates (starting with most recent):

1970-1986

1972-1979

- 14 36. Have you ever had angioplasty to improve the blood flow to your heart tissue? (Angioplasty involves catheterization with a balloon catheter that expands narrowed coronary arteries.)

39 1 NO

11 2 YES →

Please list dates (starting with most recent):

1976-1986

1984

Was blood flow improved?

4 1 NO

1 Don't know

6 2 YES

- 14 37. Each time you have an angina episode, do you believe (Circle the best answer):

9 1 YOUR HEART MAY BE HARMED A SMALL AMOUNT AND PROBABLY DOES NOT HEAL?

9 2 YOUR HEART MAY BE HARMED A SMALL AMOUNT BUT PROBABLY DOES HEAL?

30 3 YOUR HEART IS PROBABLY NOT HARMED, THE ANGINA IS SIMPLY YOUR BODY'S WARNING TO SLOW DOWN?

2 4 OTHER (please explain) _____

- 15 38. Circle the number on the scale that best describes how often the statement has been true for you in the past few years.

a. I get as much exercise as my physical condition allows. NEVER.....ALWAYS

1 2 3 4 5 6 7
3 3 10 10 13 6 5

ME

4.

b. I exert myself physically until I begin to feel angina pain or discomfort. NEVER.....ALWAYS

1 2 3 4 5 6 7
14 4 4 7 7 8 6

3

c. I follow the diet recommendations of my doctor. NEVER.....ALWAYS

1 2 3 4 5 6 7
4 1 7 6 11 12 9

4

d. I watch my pulse rate during exercise or take my blood pressure at home. NEVER.....ALWAYS

1 2 3 4 5 6 7
24 2 0 3 3 4 14

3.

e. I am under a lot of stress. NEVER.....ALWAYS

1 2 3 4 5 6 7
7 7 13 12 6 3 2

3

V. PERCEPTIONS ABOUT AIR POLLUTION

15 39. How do you usually tell when air pollution is high? (Circle all that apply)

- 7 1 DON'T USUALLY NOTICE AIR POLLUTION
- 22 2 SEE OR HEAR REPORTS IN THE NEWSPAPER, TV OR RADIO
- 20 3 SEE IT IN THE AIR
- 30 4 FEEL IT AFFECTING MY EYES OR LUNGS
- 12 5 SMELL IT
- 6 6 OTHER (please describe) _____

15 40. How often do you think there is enough air pollution in the areas where you live or work to affect your health or the health of others?

- 1 1 NEVER
- 5 2 LESS THAN 7 DAYS PER YEAR
- 10 3 7 TO 14 DAYS PER YEAR
- 10 4 14 TO 30 DAYS PER YEAR
- 8 5 30 TO 60 DAYS PER YEAR
- 15 6 MORE THAN 60 DAYS PER YEAR

15 41. (If you think air pollution sometimes aggravates your angina) On days when you are concerned that air pollution might affect your angina, what do you usually do? (Circle all that apply)

- 17 1 NOTHING DIFFERENT, KEEP TO MY USUAL ROUTINE
- 26 2 SPEND LESS TIME OUTDOORS
- 21 3 EXERCISE LESS
- 5 4 GO TO A LESS POLLUTED AREA OR PART OF TOWN
- 7 5 OTHER (please specify) _____

/ 9 not applicable

- 16 42. Please indicate the level of air pollution you think is usually associated with each of the following activities or locations.

	Low Pollution			High Pollution		<u>DON'T KNOW</u>
a. Driving at rush hour.	1 0	2 0	3 4	4 13	5 31	2
b. Driving on city streets in normal traffic.	1 1	2 4	3 28	4 10	5 6	1
c. Driving on freeways in normal traffic.	1 0	2 8	3 24	4 11	5 6	1
d. Walking on city streets.	1 1	2 11	3 16	4 16	5 5	1
e. Outdoors, near your home.	1 11	2 14	3 10	4 12	5 1	2
f. Outdoors, in parks or other public places.	1 10	2 18	3 13	4 6	5 1	2
g. Indoors, in restaurants, stores, or other public places.	1 18	2 15	3 11	4 4	5 1	1
h. Indoors, in your home.	1 28	2 18	3 3	4 0	5 0	1

VI. ADDITIONAL BACKGROUND QUESTIONS

- 16 43. Please indicate the category that represents your household's current annual (1985) income, including any disability payments.

1	1	LESS THAN \$4,999	2	7	\$30,000 - \$34,999
10	2	\$5,000 - \$9,999	5	8	\$35,000 - \$39,999
10	3	\$10,000 - \$14,999	2	9	\$40,000 - \$44,999
5	4	\$15,000 - \$19,999	0	10	\$45,000 - \$49,999
5	5	\$20,000 - \$24,999	1	11	\$50,000 - \$59,999
4	6	\$25,000 - \$29,999	2	12	\$60,000 OR MORE

3 Refused

mean \$22,021

The interviewer will ask a few additional background questions.

(INTERVIEWER: THE FOLLOWING QUESTIONS DO NOT APPEAR ON THE SUBJECT'S QUESTIONNAIRE)

44. Please indicate the last year of school that you completed.

0	1	NONE	2	10	9th GRADE
0	2	1st GRADE	1	11	10th GRADE
0	3	2nd GRADE	1	12	11th GRADE
1	4	3rd GRADE	10	13	12th GRADE
0	5	4th GRADE	4	14	FIRST YEAR OF COLLEGE
1	6	5th GRADE	8	15	SECOND YEAR OF COLLEGE
0	7	6th GRADE	4	16	THIRD YEAR OF COLLEGE
0	8	7th GRADE	6	17	FOURTH YEAR OF COLLEGE
2	9	8th GRADE	10	18	GRADUATE STUDIES

45. Is there a history of coronary heart disease in your family?

25 1 NO
24 2 YES

1 *Missing*

46. Do you smoke cigarettes?

45 1 NO

4 2 YES →

1 *Pipe*

Subjects branched into question
On average, how many packs do you smoke per week?
mean 6.25 packs Range 1-14

How many years have you smoked?

mean 35.5 years Range 18-50

47. (If NO to Q-46) Did you ever smoke cigarettes?

8 1 NO

34 2 YES →

4 *Pipe*

On average, how many packs did you smoke per week?

11.06 packs Range 1-28

How many years did you smoke?

25.81 years Range 6-50

48. Does anyone else in your household smoke?

41 1 NO

9 2 YES

49. What is your current marital status?

39 1 MARRIED

5 2 NEVER MARRIED

6 3 DIVORCED, SEPARATED, WIDOWED

50. What is your relationship in your household?

6 1 HEAD OF HOUSEHOLD LIVING ALONE

4 2 HEAD OF HOUSEHOLD LIVING WITH NON-RELATIVES

40 3 HEAD OF HOUSEHOLD WITH 2 OR MORE RELATED PERSONS

4 OTHER (specify) _____

51. Including yourself, how many individuals live in your household?

mean 2.42 persons Range 1-5

52. What is your height? _____ feet *mean 69.52 inches*

53. What is your weight? *mean 185.8 pounds*

54. What is your national or ancestral origin?

~~4~~3 1 WHITE, CAUCASIAN

~~0~~ 2 ASIAN

~~4~~ 3 HISPANIC

~~2~~ 4 BLACK, AFRO-AMERICAN

~~1~~ 5 OTHER (specify) _____

ANY ADDITIONAL COMMENTS?

DATE 11/24/86
SUBJECT _____
INTERVIEWER _____

49 subjects interviewed
1 Missing

SUPPLEMENTARY QUESTIONS ON CO EXPOSURE
CORONARY HEART DISEASE STUDY

Now that we are at the end of the questionnaire I'd like to ask you a few questions about factors of your lifestyle that may influence your exposure to an air pollutant, carbon monoxide.

1. Do you usually travel by auto, bus or foot?

48 1 personal auto
0 2 car pool
0 3 bus
1 4 walking
0 5 motorcycle
0 6 other

2. Do you travel to and from work or any other place at least three (3) times per week?

19 1 NO
30 2 YES

2a. How much time do you spend traveling one way?

25.4 minutes

3. How many hours do you spend in heavy traffic while traveling each week?

mean 1.25 hrs. Range 0-10
23 subjects = 0

4. Are you frequently around running autos or gasoline powered engines on the job or at home (e.g., auto repair work at home)?

33 1 NO
16 2 YES

5. Do you regularly use lawn equipment powered by gasoline engines?

33 1 NO
15 2 YES

1 Missing

6. Is a garage attached to your home or within the building in which you live?

22 1 NO
27 2 YES

↓
Are autos parked in the garage?

15 1 NO
12 2 YES

7. Do you have natural gas fuel appliances in your home?

4 1 NO →

INTERVIEWER PROBE: IS YOUR HOME ALL ELECTRIC?

1 NO
2 YES 2

45 2 YES

8. Do you use any of the following gas fueled appliances in your home?

37 1 gas heater
31 2 gas cooking stove or range
30 3 gas cooking oven
39 4 gas water heater
19 5 gas clothes dryer
4 6 gas or kerosene space heater
1 7 other gas appliance
2 8 other (please specify)

1 fireplace 1-gas log

9. To your knowledge is each of these appliances vented to the outside?

3 1 NO
45 2 YES

1 missing

10. Does your home have a fireplace?

23 1 NO
25 2 YES

INTERVIEWER PROBE: HOW MANY TIMES
PER MONTH DO YOU USE YOUR FIREPLACE
DURING THE WINTERTIME?

6.96 times Range. 0-30

// Subject = 0

11. If you have a kitchen exhaust fan do you use it when cooking?

13 1 No, or almost never
19 2 Yes, at times
15 3 Yes, always
2 9 Not applicable

12. If you have a kitchen window, do you open it when cooking?

8 1 No, or almost never
16 2 Yes, at times
22 3 Yes, always
3 9 Not applicable

13. Do you have energy-saving insulation or weather stripping installed in your home?

15 1 NO
33 2 YES
1 Don't Know

14. What main type of heating system do you use in your home?
(Circle best answer.)

30 1 Central warm air furnace with ducts to individual rooms
9 2 Wall furnace
4 3 Floor furnace
1 4 Portable electric room heater (circulating or radiant)
0 5 Oil or kerosene space heaters
0 6 Fireplace or woodburning stove
0 7 Solar
4 8 No heating equipment, or other
1 9 Do not know

15. Do you notice drafts in your home?

- 35 1 No, never
11 2 Yes, but rarely
3 3 Yes, often (each day)

16. Is your home located near any (within three blocks) of the following? (Circle all that apply.)

- 35 1 Busy roadway or intersection
2 Auto or truck maintenance area or garage
0 3 Site of open burning
1 4 Manufacturing plant or industry with heavy smoke emission or furnaces
0 5 Electricity or steam plant
1 6 Other (please specify) _____

17. How often are you around others who smoke?

- 33 1 Rarely
16 2 Frequently _____

Where? 1 on the job
2 at home
3 other (please specify) _____

INTERVIEWER: IF ANSWER TO QUESTION 48 (PAGE 29 INTERVIEWER VERSION) WAS YES, PLEASE ASK THE FOLLOWING QUESTION.

18. If smokers are present at home, how many?

Number of smokers 347

Approximate number of packs smoked within the home by all smokers during a typical week's time. *mean = 9.0*

Range 3-21

37 Subjects = 0
8 = 1
3 = 2
1 = 3

Structure for Database Files

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Structure for database : A:P\LOTQU1.dbf
Number of data records :      49
Date of last update   : 08/02/86

Field  Field name  Type      Width   Dec
-----
 1  DATE           Character  8
 2  SUBJECT        Character  5
 3  INTERVIEWER    Character  3
 4  CODED_BY       Character  3
 5  Q1_A_EVER      Character  2
 6  Q2_WLK_UP      Character  2
 7  Q3_WLK_LEV     Character  2
 8  Q4_DR_DY       Character  2
 9  Q5_A_CURR      Character  2
10  Q4A_A_FORK     Character  2
11  Q4A_COMMEN     Character 20
12  Q4A_WHEN       Character  3
13  Q4A8_CARE      Character  2
14  Q4A8_RX        Character  2
15  Q4A8_LIFE      Character  2
16  Q4A8_PTCA     Character  2
17  Q4A8_OTHER     Character  2
18  Q4A8_FREQ     Character  2
19  Q4A8_SEVER     Character  2
20  Q6_FREQSU      Character  2
21  Q6_FREEFA     Character  2
22  Q6_FREQWI     Character  2
23  Q6_FREQSP     Character  2
24  Q7_SEVERSU     Character  2
25  Q7_SEVERFA     Character  2
26  Q7_SEVERWI     Character  2
27  Q7_SEVERSP     Character  2
28  Q8_REST        Character  3
29  Q9_INS         Character  2
30  Q9_NOPEASN     Character  2
31  Q9A_PVT        Character  2
32  Q9A_VA         Character  2
33  Q9A_MCARE      Character  2
34  Q9A_HMO        Character  2
35  Q9A_OTHER      Character  2
36  Q9A_MEDCAL     Character  2
37  Q9B_FEE        Character  3
38  Q9C_DR_PC      Character  3
39  Q9C_ER_PC      Character  3
40  Q9C_RX_PC      Character  3
41  Q9C_YR_DEB     Character  4
42  Q10_MILES      Character  3
43  Q11_RESOKS     Character  2
44  Q11A_FREQ      Character  2
45  Q11B_COST      Character  4
46  Q11B_INS       Character  5
47  Q12_ANECFC     Character  2
48  Q12A_COST      Character  5
49  Q12A_INS       Character  6
50  Q13_RX1        Character  8
51  Q13_RX2        Character  3
52  Q13_RX3        Character  8
53  Q13_RX4        Character  8
54  Q13_RX5        Character  8
55  Q13_RX6        Character  3
56  Q13_RX7        Character  8
57  Q13_RX8        Character  8
58  Q14_RXCOST     Character  3
59  Q14A_RXINS     Character  4
60  Q15_ER         Character  2
61  Q15A_FREQ      Character  3
62  Q15B_ERCOS     Character  4
63  Q15B_ERINS     Character  5
64  Q16_ONHOSP     Character  2
65  Q16_HOS1       Character 17
66  Q16_HOS2       Character 17
67  Q16_HOS3       Character 17
68  Q17_MEDTRT     Character  2
69  Q17_TREAT1     Character  8
70  Q17_TREAT2     Character  8
71  Q17_TREAT3     Character  8
72  Q18_TEMP       Character  2
73  Q18_STRESS     Character  2
74  Q18_EXCITE     Character  2
75  Q18_EXERT      Character  2
76  Q18_POLL       Character  2
77  Q18_SMOKE      Character  2
78  Q18_HEAL       Character  2
79  Q18_OTHER      Character  2
80  Q18_RATE       Character  2
81  Q19_NOCHG      Character  2
82  Q19_NOFECA     Character  2
83  Q19_NOEXERT    Character  2
84  Q19_SLEEP      Character  2
85  Q19_NOWORK     Character  2
86  Q19_HOME       Character  2
87  Q19_SLOW       Character  2
88  Q19_STRESS     Character  2
89  Q19_WEATHR     Character  2
90  Q19_POLL       Character  2
91  Q19_SMOKE      Character  2
92  Q19_OTHER      Character  2
93  Q20_HELP       Character  2
94  Q20A_EXAMP     Character  3
95  Q20B_FREQ      Character  3
96  Q20C_COST      Character  4
97  Q20D_A_INC     Character  2
98  Q20D_ADDCP     Character  3
99  Q20E_SEVIN     Character  2
100 Q20E_AMTIN     Character  2
101 Q20F_MIND      Character  2
102 Q20F_MIAMT     Character  2
103 Q20G_REAS      Character  2
104 Q20H_HELP1     Character  3
105 Q20H_HELPX     Character  3
106 Q20H_HELP2     Character  3
107 Q20H_HELP3     Character  3
108 Q20H_HELP4     Character  3
109 Q20H_HELP5     Character  3
110 Q20H_HELP6     Character  3
111 Q20H_HELP7     Character  3
112 Q20I_EQUIP     Character  2
113 Q20I_BUY1      Character 15
114 Q20I_BUY100    Character  5
115 Q20I_BUY2      Character 15
116 Q20I_BUY200    Character  5
117 Q20I_BUY3      Character 15
118 Q20I_BUY300    Character  5
119 Q20A_BUY       Character  2
120 Q20A_EXAM      Character 15
** Total **                488

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Structure for database : A:\PILOTDB2.dbf

Number of data records : 50

Date of last update : 09/02/86

Field	Field name	Type	Width	Dec
1	SUBJECT	Character	5	
2	QA208_COST	Character	5	
3	QA208_AINC	Character	2	
4	QA208_FREQ	Character	3	
5	QA208_SEVR	Character	2	
6	QA208_AMT	Character	2	
7	QA208_INMI	Character	2	
8	QA208_AMT	Character	2	
9	QA208_REAS	Character	2	
10	QA208_COMM	Character	15	
11	QA208_BUY1	Character	15	
12	QA208_COST1	Character	5	
13	QA208_BUY2	Character	15	
14	QA208_COST2	Character	5	
15	QA208_BUY3	Character	15	
16	QA208_COST3	Character	5	
17	QA208_BUY4	Character	15	
18	QA208_COST4	Character	5	
19	Q21_EXPL	Character	2	
20	Q21A_HRSWK	Character	2	
21	Q21B_JOB1	Character	4	
22	Q21B_JOB2	Character	4	
23	Q21C_ABSNT	Character	3	
24	Q21D_SKLVE	Character	2	
25	Q21D_EXUF	Character	2	
26	Q21D_AMT	Character	3	
27	Q21E_CHGJB	Character	2	
28	Q21E_DECIN	Character	2	
29	Q21F_FEXHR	Character	2	
30	Q21F_HRLIK	Character	2	
31	Q21G_SALRY	Character	2	
32	QA21_QUIT	Character	2	
33	QA21A_WHEN	Character	2	
34	QA21B_JOB	Character	4	
35	QA21C_SAL	Character	3	
36	QA21D_RETU	Character	2	
37	QT22_WHEN	Character	4	
38	QT22_LCC	Character	3	
39	QT24_ACTVY	Character	3	
40	QT25_ACT_X	Character	3	
41	QT26_EPIS0	Character	3	
42	QT27_REST	Character	6	
43	QT27_STOP	Character	2	
44	QT27_SAME	Character	2	
45	QT27_SLOW	Character	2	
46	QT27_NTG	Character	2	
47	QT27_OTHER	Character	2	

48	QT27_HOSP	Character	2
49	QT27_RATE	Character	2
50	QT28_TREAT	Character	2
51	QT28_LOST	Character	2
52	QT28_EXPNS	Character	2
53	QT28_PAIN	Character	2
54	QT28_JOB	Character	2
55	QT28_ACT	Character	2
56	QT28_MI	Character	2
57	QT28_WORRY	Character	2
58	QT28_OTHER	Character	2
59	QT28_NONE	Character	2
60	QT28_RATE	Character	2
61	QT29_COST	Character	6
62	QT30A_AVD	Character	6
63	QT30A_REAS	Character	2
64	QT30A_COMM	Character	2
65	QT30B_2AVD	Character	8
66	QW22B_WHEN	Character	4
67	QW22B_LCC	Character	3
68	QW24B_ACT	Character	3
69	QW25B_ACTX	Character	3
70	QW26B_EPIS	Character	3
71	QW27B_REST	Character	6
72	QW27B_STOP	Character	2
73	QW27B_SAME	Character	2
74	QW27B_SLOW	Character	2
75	QW27B_NTG	Character	2
76	QW27B_OTHE	Character	2
77	QW27B_HOSP	Character	2
78	QW27B_RATE	Character	2
79	QW28B_TRET	Character	2
80	QW28B_LOST	Character	2
81	QW28B_EXPNS	Character	2
82	QW28B_PAIN	Character	2
83	QW28B_JOB	Character	2
84	QW28B_ACT	Character	2
85	QW28B_MI	Character	2
86	QW28B_WORR	Character	2
87	QW28B_OTHR	Character	2
88	QW28B_NONE	Character	2
89	QW28B_RATE	Character	2
90	QW29B_WHEN	Character	4
91	QW29B_LCC	Character	3
92	QW24E_ACT	Character	3
93	QW25C_ACTX	Character	3
94	QW26C_EPIS	Character	3
95	QW27C_REST	Character	6

96	QW27C_STOP	Character	
97	QW27C_SAME	Character	
98	QW27C_SLOW	Character	
99	QW27C_NTG	Character	
100	QW27C_OTHR	Character	
101	QW27C_HOSP	Character	
102	QW27C_RATE	Character	
103	QW28C_TRET	Character	
104	QW28C_LOST	Character	
105	QW28C_EXPNS	Character	
106	QW28C_PAIN	Character	
107	QW28C_JOB	Character	
108	QW28C_ACT	Character	
109	QW28C_MI	Character	
110	QW28C_WORR	Character	
111	QW28C_OTHR	Character	
112	QW28C_NONE	Character	
113	QW28C_RATE	Character	
114	Q31_MEDEXP	Character	
115	Q31_DECINC	Character	
116	Q31_OTHEXP	Character	
117	Q31_PAIN	Character	
118	Q31_DECJOB	Character	
119	Q31_DECACT	Character	
120	Q31_MI_INC	Character	
121	Q31_WORRY	Character	
122	Q32_I_CODE	Character	
123	Q32A_COST1	Character	
124	Q32A_COST2	Character	
125	Q32A_COST3	Character	

*** Total ***

Structure for database : A:PILOTG03.dbf

Number of data records : 50

Date of last update : 08/02/86

Field	Field name	Type	Width	Dec			
1	SUBJECT	Character	5		59	Q50_HEAD	Character 2
2	Q33_PAYTRT	Character	5		60	Q51_TOTAL	Character 2
3	Q33_WHY	Character	2		61	Q52_HEIGHT	Character 2
4	Q33_COMMEN	Character	20		62	Q53_WEIGHT	Character 3
5	Q34_MI_DX	Character	2		63	Q54_ANCEST	Character 2
6	Q34_MIDAT1	Character	2		64	COMMENTS	Character 2
7	Q34_MIDAT2	Character	2		65	S1_TRAVEL	Character 2
8	Q34_MIDAT3	Character	2		66	S2_3X_WK	Character 2
9	Q34_MIDAT4	Character	2		67	S2A_ANTTIM	Character 3
10	Q34_MIDAT5	Character	2		68	S3_HVYTRAF	Character 3
11	Q35_CAB6	Character	2		69	S4_PROXSAS	Character 2
12	Q35_REASNO	Character	15		70	S5_GASLAWN	Character 2
13	Q35A_SUR6	Character	2		71	S6_ATT6AR	Character 2
14	Q35A_REM6S	Character	15		72	S6_CARKSAR	Character 2
15	Q35_DATE1	Character	5		73	S7_GASAPPL	Character 2
16	Q35_DATE2	Character	5		74	S7A_ALLELE	Character 2
17	Q35_PTCA	Character	2		75	S8_HEATER	Character 2
18	Q36_DATE1	Character	5		76	S8_STOVE	Character 2
19	Q36_DATE2	Character	5		77	S8_OVEN	Character 2
20	Q36A_FLOW	Character	2		78	S8_WAT_HTR	Character 2
21	Q37_BELIEF	Character	2		79	S8_DRYER	Character 2
22	Q36_REYER	Character	2		80	S8_SPC_HTR	Character 2
23	Q38_RPAIN	Character	2		81	S8_QTHSAS	Character 2
24	Q38_RDICT	Character	2		82	S8_OTHER	Character 15
25	Q36_RBP	Character	2		83	S9_VENTED	Character 2
26	Q38_RSTR6	Character	2		84	S10_FIREPL	Character 2
27	Q38_DONT	Character	2		85	S10_FIRE_X	Character 3
28	Q38_HEAR	Character	2		86	S11_EXHFAN	Character 2
29	Q39_SEE	Character	2		87	S12_WINDOW	Character 2
30	Q39_FEEL	Character	2		88	S13_INSULT	Character 2
31	Q39_SMELL	Character	2		89	S14_HEATBY	Character 2
32	Q39_OTHER	Character	2		90	S15_DRAFTS	Character 2
33	Q40_ANTPOL	Character	2		91	S15_ROAD	Character 2
34	Q41_USUAL	Character	2		92	S16_MAINT	Character 2
35	Q41_NOCUTS	Character	2		93	S16_BURN	Character 2
36	Q41_LESEXR	Character	2		94	S16_INDUST	Character 2
37	Q41_GDAWAY	Character	2		95	S16_ELECT	Character 2
38	Q41_OTHER	Character	2		96	S16_OTHER	Character 2
39	Q41_NOTAPP	Character	2		97	S17_WRMKR	Character 2
40	Q42_LRUSH	Character	2		98	S17_WHERE	Character 2
41	Q42_LDRSTS	Character	2		99	S18_HOMESK	Character 2
42	Q42_LDAFWY	Character	2		100	S18_PPW	Character 2
43	Q42_LWLKST	Character	2		101	DATE_ENTER	Character 8
44	Q42_LOUTEI	Character	2		102	ENTER_BY	Character 3
45	Q42_LPARK	Character	2		** Total **		292
46	Q42_LPUBL	Character	2				
47	Q42_LHOME	Character	2				
48	Q43_35INCO	Character	3				
49	Q44_EDUC	Character	2				
50	Q45_CHDNIS	Character	2				
51	Q46_SMOKE	Character	2				
52	Q46_PPW	Character	2				
53	Q46_YRS	Character	2				
54	Q47_DIDSMK	Character	2				
55	Q47_PPW	Character	2				
56	Q47_YRSMIT	Character	2				
57	Q48_KESBWK	Character	2				
58	Q49_HARRY	Character	2				

CODING SCHEME

PILOTQU1.DBF

<u>QUESTION</u>	<u>VARIABLE NAME</u>	<u>COLUMN(S)</u>	<u>CHARACTER TYPE OR ASSIGNMENT</u>
Date of Interview	MONTH	1-2	Numeric
		3	/
	DAY	4-5	Numeric
		6	/
	YEAR	7-8	Numeric
Subject Identification	SUBJECT	9-13	Alphanumeric
Interviewer	INTVIEWR	14-16	Alphabetic
Coder	CODER	17-19	Alphabetic
Question 1	QIAEVER	20-21	1=NO 2=YES
Question 2	Q2WLKUP	22-23	1=NO 2=YES
Question 3	Q3WLKLEV	24-25	1=NO 2=YES
Question 4	Q4DRDX	26-27	1=NO 2=YES
Question 5	Q5ACUR	28-29	1=NO 2=YES
Question Alt-6	QA6AFORM	30-31	1=NO 2=YES
Question Alt-6 Why?	QA6COM	32-51	Alphabetic (Comment Field)
Question Alt-6a	QA6AWHEN	52-54	Numeric (No. of months ago)
Question Alt-6b	QA6BCABG	55-56	2=YES
	QA6BRX	57-58	2=YES
	QA6BLIFE	59-60	2=YES
	QA6BPTCA	61-62	2=YES
	QA6BOTH	63-64	2=YES
Question Alt-6c	QA6CFRQ	65-66	1-9
Question Alt-6d	QA6DSEV	67-68	1-7
Question 6	Q6FRQSU	69-70	1-9
	Q6FRQFA	71-72	1-9

	Q6FRQWI	73-74	1-9
	Q6FRQSP	75-76	1-9
Question 7	Q7SEVSU	77-78	1-7
	Q7SEVFA	79-80	1-7
	Q7SEVWI	81-82	1-7
	Q7SEVSP	83-84	1-7
Question 8	Q8REST	85-87	Numeric (No. of days in 12 months)
Question 9	Q9INS	88-89	1=NO 2=YES
Question 9 Why?	Q9NOREAS	90-91	2=COMMENT (See Listing)
Question 9a	Q9APVT	92-93	2=YES
	Q9AVA	94-95	2=YES
	Q9AMCARE	96-97	2=YES
	Q9AHMO	98-99	2=YES
	Q9AOTH	100-101	2=YES
	Q9AMCAL	102-103	2=YES
Question 9b	Q9BPREM	104-109	Numeric (Exact amount paid in dollars and cents)
Question 9c	Q9CDRPC	110-112	Numeric
	Q9CERPC	113-115	Numeric
	Q9CRXPC	116-118	Numeric
	Q9CYRDED	119-122	Numeric (Yearly deductible in whole dollars)
Question 10	Q10MILES	123-125	Numeric
Question 11	Q11REGCK	126-127	1=NO 2=YES
Question 11a	Q11AFRQ	128-129	Numeric
Question 11b	Q11BCST	130-133	Numeric (Whole dollars)
Question 11b Insurance	Q11BINS	134-138	Numeric (Whole dollars)
Question 12	Q12AFRQ	139-140	Numeric
Question 12a	Q12ACST	141-145	Numeric (Whole dollars)
Question 12a Insurance	Q12AINS	146-151	Numeric (Whole dollars)

Question 13	Q13RX1	152-154	Numeric (See Medication Codes)
		155	/
	Q13RX1MG	156-159	Numeric (Dose per day in whole mg)
	Q13RX2	160-162	Numeric
		163	/
	Q13RX2MG	164-167	Numeric
	Q13RX3	168-170	Numeric
		171	/
	Q13RX3MG	172-175	Numeric
	Q13RX4	176-178	Numeric
		179	/
	Q13RX4MG	180-183	Numeric
	Q13RX5	184-186	Numeric
		187	/
	Q13RX5MG	188-191	Numeric
	Q13RX6	192-194	Numeric
		195	/
	Q13RX6MG	196-199	Numeric
	Q13RX7	200-202	Numeric
		203	/
	Q13RX7MG	204-207	Numeric
	Q13RX8	208-210	Numeric
		211	/
	Q13RX8MG	212-215	Numeric
Question 14	Q14RXCST	216-218	Numeric (Whole dollars)
Question 14 Insurance	Q14RXINS	219-222	Numeric (Whole dollars)
Question 15	Q15ER	223-224	1=NO 2=YES
Question 15a	Q15ERFRQ	225-227	Numeric
Question 15b	Q15ERCST	228-231	Numeric (Whole dollars)
Question 15b Insurance	Q15ERINS	232-236	Numeric (Whole dollars)
Question 16	Q16OVRNI	237-238	1=NO 2=YES
Question 16 Hospitalization 1	Q16H1DAY	239-242	Numeric (Month and Year)
	Q16H1STY	243-245	Numeric (Stay in days)
	Q16H1DX	246-248	Numeric (Cause, see Q16 codes)
	Q16H1CST	249-253	Numeric (Cost in whole dollars)
	Q16H1INS	254-255	Numeric (Cost in 1,000 dollars)
	Q16H2DAY	256-259	Numeric

Hospitalization 2	Q16H2STY	260-262	Numeric
	Q162DX	263-265	Numeric
	Q16H2CST	266-270	Numeric
	Q16H2INS	271-272	Numeric
Hospitalization 3	Q16H3DAY	273-276	Numeric
	Q16H3STY	277-279	Numeric
	Q16H3DX	280-282	Numeric
	Q16H3CST	283-287	Numeric
	Q16H3INS	288-289	Numeric
Question 17	Q17MEDTR	290-291	1=NO 2=YES
Question 17	Q17T1	292-294	Numeric (Treatment, see Q17 Codes)
		295	/
	Q17T1CST	296-299	Numeric (Cost in whole dollars)
	Q17T2	300-302	Numeric
		303	/
	Q17T2CST	304-307	Numeric
	Q17T3	308-310	Numeric
		311	/
	Q17T3CST	312-315	Numeric
Question 18	Q18TEMP	316-317	2=YES
	Q18STR	318-319	2=YES
	Q18EXCIT	320-321	2=YES
	Q18EXR	322-323	2=YES
	Q18POL	324-325	2=YES
	Q18SMK	326-327	2=YES
	Q18MEALS	328-329	2=YES
	Q18OTH	330-331	2=YES
Question 19	Q18RATE	332-333	1-8
	Q19NOCHG	334-335	2=YES
	Q19NOREC	336-337	2=YES
	Q19NOEXR	338-339	2=YES
	Q19SLEEP	340-341	2=YES
	Q19OFFWK	342-343	2=YES
	Q19HOME	344-345	2=YES
	Q19SLOW	346-347	2=YES
	Q19NOSTR	348-349	2=YES
	Q19NOWTH	350-351	2=YES
	Q19NOPOL	352-353	2=YES
	Q19NOSMK	354-355	2=YES
Question 20	Q19NOOTH	356-357	2=YES
	Q20HIRE	358-359	1=NO 2=YES

Question 20a	Q20EXAMP	360-362	Numeric (See Activity Codes)
Question 20b	Q20BFRQ	363-365	Numeric
Question 20c	Q20CCST	366-369	Numeric (Cost in whole dollars)
Question 20d	Q20DMORE	370-371	1=NO 2=YES
Question 20d Additional	Q20DADD	372-374	Numeric
Question 20e	Q20ESEV	375-376	1=NO 2=YES
Question 20e	Q20ESEV7	377-378	1-7
Question 20f	Q20FMI	379-380	1=NO 2=YES
Question 20f	Q20FMIPC	381-382	1-5
Question 20g	Q20GREAS	383-384	1=NO 2=YES
Question 20h	Q20H1	385-387	Numeric (See Activity Codes)
	Q20H1FRQ	388-390	Numeric
	Q20H2	391-393	Numeric
	Q20H2FRQ	394-396	Numeric
	Q20H3	397-399	Numeric
	Q20H3FRQ	400-402	Numeric
	Q20H4	403-405	Numeric
Question 20i	Q20H4FRQ	406-408	Numeric
	Q20IEQP	409-410	1=NO 2=YES
	Q20IEQP1	411-425	Numeric (Purchase, see Q20i Codes)
	Q20I1CST	426-430	Numeric (Cost in whole dollars)
	Q20IEQP2	431-445	Numeric
	Q20I2CST	446-450	Numeric
	Q20IEQP3	451-465	Numeric
Question Alt-20	Q20I3CST	466-470	Numeric
	QA20EQP	471-472	Numeric
Question Alt-20a	QA20AEX	473-487	Numeric (See Activity Codes)

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<u>QUESTION</u>	<u>VARIABLE NAME</u>	<u>COLUMN(S)</u>	<u>CHARACTER TYPE OR ASSIGNMENT</u>
Subject identification	SUBJECT	1-5	Alphanumeric
Question Alt-20b	QA20BCST	6-10	Numeric
Question Alt-20c	QA20CINC	11-12	1=NO 2=YES
Question Alt-20c	QA20CADD	13-15	Numeric
Question Alt-20d	QA20DSEV	16-17	1-2
Question Alt-20d	QA20DSV7	18-19	1-7
Question Alt-20e	QA20EMI	20-21	1=NO 2=YES
Question Alt-20e	QA20EMIR	22-23	1-5
Question Alt-20f	QA20FRQA	24-25	1=NO 2=YES
Question Alt-20f	QA20FCOM	26-40	Alphabetic (Comment Field)
Question Alt-20g	QA20GEQP	41-55	Numeric (Purchase, see Q20i Codes)
	QA20G1CS	56-60	Numeric (Cost in whole dollars)
	QA20GE2	61-75	Numeric
	QA20G2CS	76-80	Numeric
	QA20GE3	81-95	Numeric
	QA20G3CS	96-100	Numeric
	QA20GE4	101-115	Numeric
	QA20G4CS	116-120	Numeric
Question 21	Q21EMPLY	121-122	1=NO 2=YES
Question 21a	Q21AHR5	123-124	Numeric
Question 21b	Q21BOCC1	125-128	Numeric
	Q21BOCC2	129-132	Numeric
Question 21c	Q21CMISS	133-135	Numeric
Question 21d	Q21DSKLV	136-137	1=NO 2=YES
	Q21DCOVR	138-139	1=NO 2=YES
	Q21DDAYS	140-142	Numeric
Question 21e	Q21ECGJB	143-144	1=NO 2=YES

	Q21EREDC	145-146	1=NO 2=YES
Question 21f	Q21FFEWR	147-148	1=NO 2=YES
	Q21FLIKE	149-150	Numeric
Question 21g	Q21GINCM	151-153	1-12
Question Alt-21	QA21QUIT	154-155	1=NO 2=YES
Question Alt-21a	QA21AAGO	156-157	Numeric
Question Alt-21b	QA21BOCC	158-161	Numeric (See Occupation Codes)
Question Alt-21c	QA21CINC	162-164	1-12
Question Alt-21d	QA21DRET	165-166	1=NO 2=YES
Question 22	Q22WHEN	167-170	Numeric (Days ago)
Question 23	Q23LOC	171-173	Numeric (See Microenvironment Codes)
Question 24	Q24ACT	174-176	Numeric (See Activity Codes)
Question 25	Q25TIM	177-179	Numeric
Question 26	Q26DUR	180-182	Numeric
Question 27	Q27REST	183-184	2=YES
		185	/
	Q27MIN	186-188	Numeric
	Q27STOP	189-190	2=YES
	Q27SAME	191-192	2=YES
	Q27SLOW	193-194	2=YES
	Q27NTG	195-196	2=YES
	Q27OTH	197-198	2=YES
	Q27HOSP	199-200	2=YES (Sought relief at hospital)
	Q27RATE	201-202	1-7
Question 28	Q28MED	203-204	2=YES
	Q28LOST	205-206	2=YES
	Q28EXP	207-208	2=YES
	Q28PAIN	209-210	2=YES
	Q28JOB	211-212	2=YES
	Q28ACT	213-214	2=YES
	Q28MI	215-216	2=YES
	Q28WOR	217-218	2=YES
	Q28OTH	219-220	2=YES

	Q28RATE	223-224	1-10
Question 29	Q29CST	225-230	Numeric (Cost in whole dollars)
Question 30a	Q30AAVD1	231-238	Numeric (Payment in whole dollars)
	Q30AREAS	239-240	1-4
	Q30ACOM	241-242	1-4 (See Q30a Codes)
Question 30b	Q30BAVD2	243-250	Numeric (Payment in whole dollars)
Question 22b	Q22BWHEN	251-254	Numeric (Days ago)
Question 23b	Q23BLOC	255-257	Numeric (See Microenvironment Codes)
Question 24b	Q24BACT	258-260	Numeric (See Activity Codes)
Question 25b	Q25BTIM	261-263	Numeric
Question 26b	Q26BDUR	264-266	Numeric
Question 27b	Q27BREST	267-268	2=YES
		269	/
	Q27BMIN	270-272	Numeric
	Q27BSTOP	273-274	2=YES
	Q27BSAME	275-276	2=YES
	Q27BSLOW	277-278	2=YES
	Q27BNTG	279-280	2=YES
	Q27BOTH	281-282	2=YES
	Q27BHOSP	283-284	2=YES (Sought relief at hospital)
	Q27BRATE	285-286	1-7
Question 28b	Q28BMED	287-288	2=YES
	Q28BLOST	289-290	2=YES
	Q28BEXP	291-292	2=YES
	Q28BPAIN	293-294	2=YES
	Q28BJOB	295-296	2=YES
	Q28BACT	297-298	2=YES
	Q28BMI	299-300	2=YES
	Q28BWOR	301-302	2=YES
	Q28BOTH	303-304	2=YES
	Q28BNONE	305-306	2=YES
	Q28BRATE	307-308	1-10
Question 22c	Q22CWHEN	309-312	Numeric (Days ago)

Question 23c	Q23CLOC	313-315	Numeric (See Microenvironment Codes)
Question 24c	Q24CACT	316-318	Numeric (See Activity Codes)
Question 25c	Q25CTIM	319-321	Numeric
Question 26c	Q25CDUR	322-324	Numeric
Question 27c	Q27CREST	325-326	2=YES
		327	/
	Q27CMIN	328-330	2=YES
	Q27CSTOP	331-332	2=YES
	Q27CSAME	333-334	2=YES
	Q27CSLOW	335-336	2=YES
	Q27CNTG	337-338	2=YES
	Q27COTH	339-340	2=YES
	Q27CHOSP	341-342	2=YES (Sought relief at hospital)
	Q27CRATE	343-344	1-7
Question 28c	Q28CMED	345-346	2=YES
	Q28CLOST	347-348	2=YES
	Q28CEXP	349-350	2=YES
	Q28CPAIN	351-352	2=YES
	Q28CJOB	353-354	2=YES
	Q28CACT	355-356	2=YES
	Q28CMI	357-358	2=YES
	Q28CWOR	359-360	2=YES
	Q28COTH	361-362	2=YES
	Q28CNONE	363-364	2=YES
	Q28CRATE	365-366	1-10
Question 31	Q31AMED	367-368	1-10
	Q31BINC	369-370	1-11 (11 = Subject believed not applicable; e.g., retired)
	Q31CEXP	371-372	1-10
	Q31DPAIN	373-374	1-10
	Q31EJOB	375-376	1-11 (11 = Subject believed not applicable; e.g., retired)
	Q31FACT	377-378	1-10
	Q31GMI	379-380	1-10
	Q31HWOR	381-382	1-10
Question 32	Q32TREAT	383-385	Numeric (See Treatment Codes)
	Q32ONE	386-388	1=NO 2=YES
	Q32TWO	389-390	1=NO 2=YES

Q32THREE 391-392 1=NO 2=YES

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<u>QUESTION</u>	<u>VARIABLE NAME</u>	<u>COLUMN(S)</u>	<u>CHARACTER TYPE OR ASSIGNMENT</u>
Subject Identification	SUBJECT	1-5	Alphanumeric
Question 33	Q33PAY	6-10	Numeric (Payment in dollars)
	Q33REAS	11-12	1-4
	Q33COM	13-32	1-4 (See Q30a Codes)
Question 34	Q34MIDX	33-34	1=NO 2=YES
	Q34MI1YR	35-36	Numeric (Year of most recent MI)
	Q34MI2YR	37-38	Numeric
	Q34MI3YR	39-40	Numeric
	Q34MI4YR	41-42	Numeric
	Q34MI5YR	43-44	Numeric
Question 35	Q35NCABG	45-46	1=NO 2=YES
	Q35DRNO	47-61	Numeric (See Q35 Codes)
	Q35YCABG	62-63	1=NO 2=YES
	Q35NREAS	64-78	Numeric (See Q35 Codes)
	Q35BG1MO	79-80	Numeric (Month of 1st CABG)
		81	/
	Q35BG1YR	82-83	Numeric (Year of 1st CABG)
	Q35BG2MO	84-85	Numeric (Month of 2nd CABG)
		86	/
	Q35BG2YR	87-88	Numeric (Year of 2nd CABG)
Question 36	Q36PTCA	89-90	1=NO 2=YES
	Q36A1MO	91-92	Numeric (Month of 1st PTCA)
		93	/
	Q36A1YR	94-95	Numeric (Year of 1st PTCA)
	Q36A2MO	96-97	Numeric (Month of 2nd PTCA)
		98	/
	Q36A2YR	99-100	Numeric (Year of 2nd PTCA)
	Q36FLOW	101-102	1=NO 2=YES
Question 37	Q37BELIF	103-104	1-4
Question 38	Q38AEXER	105-106	1-7
	Q38BPAIN	107-108	1-7
	Q38CDIET	109-110	1-7
	Q38DPULS	111-112	1-7

	Q38ESTR	113-114	1-7
Question 39	Q39DONT	115-116	2=YES
	Q39HEAR	117-118	2=YES
	Q39SEE	119-120	2=YES
	Q39FEEL	121-122	2=YES
	Q39SMELL	123-124	2=YES
	Q39OTH	125-126	2=YES
Question 40	Q40AFFCT	127-128	1-6
Question 41	Q41USUAL	129-130	2=YES
	Q41NOOUT	131-132	2=YES
	Q41NOEXR	133-134	2=YES
	Q41GOAWY	135-136	2=YES
	Q41OTH	137-138	2=YES
	Q41NOTAP	139-140	2=YES
Question 42	Q42ARUSH	141-142	1-5
	Q42BCITY	143-144	1-5
	Q42CFRWY	145-146	1-5
	Q42DWALK	147-148	1-5
	Q42EOHOM	149-150	1-5
	Q42FPARK	151-152	1-5
	Q42GiNPP	153-154	1-5
	Q42HIHOM	155-156	1-5
Question 43	Q43HHINC	157-159	1-12
Question 44	Q44EDUC	160-161	1-18
Question 45	Q45CHDFM	162-163	1=NO 2=YES
Question 46	Q46CSMK	164-165	1=NO 2=YES
	Q46CPPW	166-167	Numeric
	Q46CYR	168-169	Numeric
Question 47	Q47FSMK	170-171	1=NO 2=YES 3= PIPE OR CIGAR
	Q47FPPW	172-173	Numeric
	Q47FYR	174-175	Numeric
Question 48	Q48HHSMK	176-177	1=NO 2=YES
Question 49	Q49MARRY	178-179	1-3
Question 50	Q50HEAD	180-181	1-4
Question 51	Q51HHNUM	182-183	Numeric

Question 52	Q52HT	184-185	Numeric (Height in inches)
Question 53	Q53WT	186-188	Numeric (Weight in pounds)
Question 54	Q54RACE	189-190	Numeric
Comments?	COM	191-192	1=NO 2=YES (See Listing)

Supplementary Questions

Question 1	S1TRAVEL	193-194	1-6
Question 2	S2COMUTE	195-196	1=NO 2=YES
Question 2a	S2AMIN	197-199	Numeric
Question 3	S3TRAFHR	200-202	Numeric
Question 4	S4ENGINE	203-204	1=NO 2=YES
Question 5	S5LAWNEQ	205-206	1=NO 2=YES
Question 6	S6GARATT	207-208	1=NO 2=YES
	S6GARPK	209-210	1=NO 2=YES
Question 7	S7NATGAS	211-212	1=NO 2=YES
	S7ALLELE	213-214	1=NO 2=YES
Question 8	S8GASFUR	215-216	2=YES
	S8GASRNG	217-218	2=YES
	S8GASOVN	219-220	2=YES
	S8GASWH	221-222	2=YES
	S8GASDRY	223-224	2=YES
	S8GASSPC	225-226	2=YES
	S8GASOTH	227-228	2=YES
	S8OTH	229-243	Alphabetic (Comment Field)
Question 9	S9VENT	244-245	1=NO 2=YES
Question 10	S10FP	246-247	1=NO 2=YES
	S10FPFRQ	248-250	Numeric
Question 11	S11KFAN	251-252	1-3, 9
Question 12	S12KWIN	253-254	1-3, 9
Question 13	S13INSUL	255-256	1=NO 2=YES

Question 14	S14FUR	257-258	1-9
Question 15	S15DRAFT	259-260	1=NO 2=YES
Question 16	S16ROAD	261-262	2=YES
	S16MAINT	263-264	2=YES
	S16BURN	265-266	2=YES
	S16INDST	267-268	2=YES
	S16STEAM	269-270	2=YES
	S16OTH	271-272	2=YES
Question 17	S17OSMK	273-274	1-2
	S17OSMKW	275-276	1-3
Question 18	S18HSMK	277-278	Numeric
	S18HSMKP	279-280	Numeric
Input Date	INMO	281-282	Numeric
		283	/
	INDAY	284-285	Numeric
		286	/
	INYR	287-288	Numeric
Entry Person	INPUT	289-291	Alphabetic

QUESTION 13 - MEDICATION CODES

Experimental Drugs, unspecified	050
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Nitrates, Oral

Nitrate capsules, unspecified	100
Nitroglycerin tablets	101
Isordil	102
Isosorbide dinitrate	103
Nitro-bid capsules	104
Cardilate	105
Peritrate	106
Persantine (Dipyridamole)	107
Sorbitrate	108
_____	109
_____	110

Nitrates, Transdermal

Nitrate ointment, unspecified	150
Nitropatch	151
Nitro-bid ointment	152
Nitrol	153
Nitrong	155
Nitrostat	156
_____	157
_____	158

Calcium Channel Blockers, oral

Calcium channel blockers, unspecified	200
Calan (Verapamil)	201
Cardizem (Diltiazem)	202
Procardia (Nifedipine)	203
Isoptin (Verapamil)	204
_____	205
_____	206

Beta-Blockers, oral

Beta blockers, unspecified	300
Corgard (Nadolol)	301
Corzide (Nadolol)	302
Inderol (Propranolol)	303
Inderide (Propranolol)	304
Lopressor (Metoprolol tartrate)	305
Tenormin (Atenolol)	306
Viskin (Pindolol)	307
_____	308
_____	309
_____	310

Quinidine, oral	
Quinidine sulfate, unspecified	400
Quinadez (quinidine)	401
Cardioquin (quinidine)	402
_____	403
_____	404
_____	405
 Digoxin and Digitalis, oral	
Digoxin, digitalis, unspecified	500
Lanoxin (Digoxin)	501
Lanoxicaps (Digoxin)	502
Crystodigin (Digitalis glycoside)	503
_____	504
_____	505
 Procainamide, oral	
Procainamide hydrochloride, unspecified	600
Pronestyl (Procainamide)	601
_____	602
_____	603
 Anti-hypertensives, oral	
Anti-hypertensives, unspecified	700
Hydrochlorothiazide, unspecified	701
Aldactizide	702
Aldactone	702
Catapres (Clonidine)	703
Hydrodiuril	705
Hygroton	706
Minipress (Prazosin)	707
Minizide (Prazosin)	708
Nitropress	709
Tenormin	710
Dyazide	711
Hydropress	712
Hydroxyzine hydrochloride	713
_____	714
_____	715
Capoten (Captopril)	750
 Blood Thinning and Anti-coagulant Medications	
Persantine (Dipyridamole)	797
Coumadin, oral (Warfarin sodium)	798
Aspirin	799

Diuretics, oral	
Diuretic, unspecified	800
Furosemide, unspecified	801
Lasix (Furosemide)	802
Maxzide (K sparing, with hydrochlorothiazide)	803
Spironolactone	805
Potassium replacement	806
_____	807
_____	808

Cholesterol Lowering Drugs	
Cholesterol lowering medications, unspecified	850
Colestid	851
Permacol	852
Probucol	853
_____	854
_____	855

Insulin and Blood Glucose Lowering Drugs	
Insulin, specified	900
Diabenase	950
Micronase	952
Orinase	953
Tolinase	954
Insulin, Regular (Lente, Ultralente)	955
Insulin, NPH	957
Chloropropamide	958
Penday	959
_____	960

Tranquilizers, oral	
Tranquilizers, unspecified	
(Valium, Xanax, Meprobamate)	960

QUESTION 16 - HOSPITALIZATION CODES

Heart Illness

Heart ailment, unspecified	100
Severe or recurrent angina	101
Severe or recurrent arrhythmia	102
Acute myocardial infarction	103
Cardiac failure (cardiac insufficiency)	104
Pericarditis	105
_____	106
_____	107
_____	108
_____	109

Heart Tests or Treatment

Heart testing or treatment, unspecified	110
Treadmill stress test	111
Angiogram	112
Angioplasty (PTCA)	113
Coronary artery bypass graft surgery (CABG)	114
_____	115
_____	116
_____	117

QUESTION 17 - ITEMIZED EXPENDITURES FOR HEALTH OR FITNESS
PROGRAM CODES

Exercise or fitness program expenses	
Exercise program expenses, unspecified	100
Walking/jogging shoes and clothing	101
Weights/dumbbells	102
Bicycle	103
Exercycle	104
Health club or spa membership and use fees	105
Medical rehabilitation program expenses	
Medical rehabilitation program	106
_____	107
_____	108
_____	109
_____	110

QUESTIONS 20i AND ALT-20a - EQUIPMENT OR STRUCTURAL
EXPENDITURE CODES

New appliances, unspecified	100
Power yardcare equipment	101
Kitchen appliances	102
Power home maintenance equipment	103
Garage door opener	104
Cart/wheelbarrow	105
Air conditioner	106
Clothes washer and/or dryer	107
Structural changes to home (e.g., railings, ramps)	108
Cart to carry items (e.g., groceries, trash cans)	109
 New furniture, unspecified	 110
Bed	111
Chair	112
_____	113
_____	114
_____	115
 New Automobile	 120

QUESTIONS 21b AND ALT-21b - OCCUPATION CODES

Three-digit classification scheme obtained from Robert Friis, University of California, Medical Center. Source information and citation is unknown.

OCCUPATIONAL CLASSIFICATION

(The single letter or 3-digit number in the left margin is the code symbol for the occupation category; "n.e.c." means not elsewhere classified)

PROFESSIONAL, TECHNICAL, AND KINDRED WORKERS

000	Accountants and auditors
010	Actors and actresses
012	Airplane pilots and navigators
013	Architects
014	Artists and art teachers
015	Athletes
020	Authors
021	Chemists
022	Chiropractors
023	Clergymen
	College presidents, professors, and instructors (n.e.c.)
030	College presidents and deans
031	Professors and instructors, agricultural sciences
032	Professors and instructors, biological sciences
034	Professors and instructors, chemistry
035	Professors and instructors, economics
040	Professors and instructors, engineering
041	Professors and instructors, geology and geophysics
042	Professors and instructors, mathematics
043	Professors and instructors, medical sciences
045	Professors and instructors, physics
050	Professors and instructors, psychology
051	Professors and instructors, statistics
052	Professors and instructors, natural sciences (n.e.c.)
053	Professors and instructors, social sciences (n.e.c.)
054	Professors and instructors, nonscientific subjects
060	Professors and instructors, subject not specified
070	Dancers and dancing teachers
071	Dentists
072	Designers
073	Dietitians and nutritionists
074	Draftsmen
075	Editors and reporters
080	Engineers, aeronautical
081	Engineers, chemical
082	Engineers, civil
083	Engineers, electrical
084	Engineers, industrial
085	Engineers, mechanical
090	Engineers, metallurgical, and metallurgists
091	Engineers, mining
092	Engineers, sales
093	Engineers (n.e.c.)
101	Entertainers (n.e.c.)
102	Farm and home management advisers
103	Foresters and conservationists
104	Funeral directors and embalmers
105	Lawyers and judges
111	Librarians
120	Musicians and music teachers

PROFESSIONAL, TECHNICAL, AND KINDRED WORKERS--Con.

	Natural scientists (n.e.c.)
130	Agricultural scientists
131	Biological scientists
134	Geologists and geophysicists
135	Mathematicians
140	Physicists
145	Miscellaneous natural scientists
150	Nurses, professional
151	Nurses, student professional
152	Optometrists
153	Osteopaths
154	Personnel and labor relations workers
160	Pharmacists
161	Photographers
162	Physicians and surgeons
163	Public relations men and publicity writers
164	Radio operators
165	Recreation and group workers
170	Religious workers
171	Social and welfare workers, except group
	Social scientists
172	Economists
173	Psychologists
174	Statisticians and actuaries
175	Miscellaneous social scientists
180	Sports instructors and officials
181	Surveyors
182	Teachers, elementary schools
183	Teachers, secondary schools
184	Teachers (n.e.c.)
185	Technicians, medical and dental
190	Technicians, electrical and electronic
191	Technicians, other engineering and physical sciences
192	Technicians (n.e.c.)
193	Therapists and healers (n.e.c.)
194	Veterinarians
195	Professional, technical, and kindred workers (n.e.c.)

FARMERS AND FARM MANAGERS

220	Farmers (owners and tenants)
222	Farm managers

MANAGERS, OFFICIALS, AND PROPRIETORS, EXCEPT FARM

250	Buyers and department heads, store
251	Buyers and shippers, farm products
252	Conductors, railroad
253	Credit men
254	Floor men and floor managers, store
260	Inspectors, public administration
262	Managers and superintendents, building
265	Officers, pilots, pursers, and engineers, ship
270	Officials and administrators (n.e.c.), public administration
275	Officials, lodge, society, union, etc.
280	Postmasters
285	Purchasing agents and buyers (n.e.c.)
299	Managers, officials, and proprietors (n.e.c.)

CLERICAL AND KINDRED WORKERS

301 Agents (n.e.c.)
302 Attendants and assistants, library
303 Attendants, physician's and dentist's office
304 Baggage men, transportation
305 Bank tellers
310 Bookkeepers
312 Cashiers
313 Collectors, bill and account
314 Dispatchers and starters, vehicle
315 Express messengers and railway mail clerks
320 File clerks
321 Insurance adjusters, examiners, and investigators
323 Mail carriers
324 Messengers and office boys
325 Office machine operators (computer operator)
333 Payroll and timekeeping clerks
340 Postal clerks
341 Receptionists
342 Secretaries
343 Shipping and receiving clerks
345 Stenographers
350 Stock clerks and storekeepers
351 Telegraph messengers
352 Telegraph operators
353 Telephone operators
354 Ticket, station, and express agents
360 Typists
369 Clerical and kindred workers (n.e.c.)

SALES WORKERS

380 Advertising agents and salesmen
381 Auctioneers
382 Demonstrators
383 Hicksters and peddlers
385 Insurance agents, brokers, and underwriters
390 Newsboys
393 Real estate agents and brokers
395 Stock and bond salesman
399 Salesmen and sales clerks (n.e.c.)

CRAFTSMEN, FOREMEN, AND KINDRED WORKERS

401 Bakers
402 Blacksmiths
403 Boilermakers
404 Bookbinders
405 Brickmasons, stonemasons, and tile setters
410 Cabinetmakers
412 Carpenters
413 Cement and concrete finishers
414 Compositors and typesetters
415 Cranemen, derrickmen, and hoistmen
420 Decorators and window dressers
421 Electricians
423 Electrotypers and stereotypers

CRAFTSMEN, FOREMEN, AND KINDRED WORKERS--Con.

424 Engravers, except photoengravers
 425 Excavating, grading, and road machinery operators
 430 Foremen (n.e.c.)
 431 Forgemen and hammermen
 432 Furriers
 434 Glaziers
 435 Heat treaters, annealers, and temperers
 444 Inspectors, scalers, and graders, log and lumber
 450 Inspectors (n.e.c.)
 451 Jewelers, watchmakers, goldsmiths, and silversmiths
 452 Job setters, metal
 453 Linemen and servicemen, telegraph, telephone, and power
 454 Locomotive engineers
 460 Locomotive firemen
 461 Locom fixers
 465 Machinists
 470 Mechanics and repairmen, air conditioning, heating, and refrigeration
 471 Mechanics and repairmen, airplane
 472 Mechanics and repairmen, automobile
 473 Mechanics and repairmen, office machine
 474 Mechanics and repairmen, radio and television
 475 Mechanics and repairmen, railroad and car shop
 480 Mechanics and repairmen (n.e.c.)
 490 Millers, grain, flour, feed, etc.
 491 Millwrights
 492 Molders, metal
 493 Motion picture projectionists
 494 Opticians, and lens grinders and polishers
 495 Painters, construction and maintenance
 501 Paperhangers
 502 Pattern and model makers, except paper
 503 Photoengravers and lithographers
 504 Piano and organ tuners and repairmen
 505 Plasterers
 510 Plumbers and pipe fitters
 512 Pressmen and plate printers, printing
 513 Rollers and roll hands, metal
 514 Roofers and slaters
 515 Shoemakers and repairers, except factory
 520 Stationary engineers
 521 Stone cutters and stone carvers
 523 Structural metal workers
 524 Tailors and tailoresses
 525 Tinsmiths, coppersmiths, and sheet metal workers
 530 Toolmakers, and die makers and setters
 535 Upholsterers
 545 Craftsmen and kindred workers (n.e.c.)
 555 Members of the armed forces

OPERATIVES AND KINDRED WORKERS²

601 Apprentice auto mechanics
 602 Apprentice bricklayers and masons
 603 Apprentice carpenters
 604 Apprentice electricians
 605 Apprentice machinists and toolmakers
 610 Apprentice mechanics, except auto

OPERATIVES AND KINDRED WORKERS--Con.

612	Apprentice plumbers and pipe fitters
613	Apprentices, building trades (n.e.c.)
614	Apprentices, metalworking trades (n.e.c.)
615	Apprentices, printing trades
620	Apprentices, other specified trades
621	Apprentices, trade not specified
630	Asbestos and insulation workers
631	Assemblers
632	Attendants, auto service and parking
634	Blasters and powdermen
635	Boatmen, canalmen, and lock keepers
640	Brakemen, railroad
641	Bus drivers
642	Chainmen, rodmen, and axmen, surveying
643	Checkers, examiners, and inspectors, manufacturing
645	Conductors, bus and street railway
650	Deliverymen and routemen
651	Dressmakers and seamstresses, except factory
652	Dyers
653	Files, grinders, and polishers, metal
654	Fruit, nut, and vegetable graders and packers, except factory
670	Furnacemen, smeltermen, and pourers
671	Graders and sorters, manufacturing
672	Heaters, metal
673	Knitters, loopers, and toppers, textile
674	Laundry and dry cleaning operatives
675	Meat cutters, except slaughter and packing house
680	Milliners
685	Mine operatives and laborers (n.e.c.)
690	Motorman, mine, factory, logging camp, etc.
691	Motormen, street, subway, and elevated railway
692	Oilers and greasers, except auto
693	Packers and wrappers (n.e.c.)
694	Painters, except construction and maintenance
695	Photographic process workers
701	Power station operators
703	Sailors and deck hands
704	Sawyers
705	Sewers and stitchers, manufacturing
710	Spinners, textile
712	Stationary firemen
713	Switchmen, railroad
714	Taxicab drivers and chauffeurs
715	Truck and tractor drivers
720	Weavers, textile
721	Welders and flame-cutters
729	Operatives and kindred workers (n.e.c.)

PRIVATE HOUSEHOLD WORKERS

801	Baby sitters, private household
802	Housekeepers, private household
803	Laundresses, private household
809	Private household workers (n.e.c.)

SERVICE WORKERS, EXCEPT PRIVATE HOUSEHOLD

810	Attendants, hospital and other institutions
812	Attendants, professional and personal service (n.e.c.)
813	Attendants, recreation and amusement
814	Barbers
815	Bartenders
820	Bootblacks
821	Boarding and lodging house keepers
823	Chambermaids and maids, except private household
824	Charwomen and cleaners
825	Cooks, except private household
830	Counter and fountain workers
831	Elevator operators
843	Hairdressers and cosmetologists
832	Housekeepers and stewards, except private household
834	Janitors and sextons
835	Kitchen workers (n.e.c.), except private household
840	Midwives
841	Porters
842	Practical nurses
	Protective service workers
850	Firemen, fire protection
851	Guards, watchmen, and doorkeepers
852	Marshals and constables
853	Policemen and detectives
854	Sheriffs and bailiffs
860	Watchmen (crossing) and bridge tenders
874	Ushers, recreation and amusement
875	Waiters and waitresses
890	Service workers, except private household (n.e.c.)

FARM LABORERS AND FOREMEN

901	Farm foreman
902	Farm laborers, wage workers
903	Farm laborers, unpaid family workers
905	Farm service laborers, self-employed

LABORERS, EXCEPT FARM AND MINE¹

960	Carpenters' helpers, except logging and mining
962	Fishermen and oystermen
963	Garage laborers, and car washers and greasers
964	Gardeners, except farm, and groundskeepers
965	Longshoremen and stevedores
970	Lumbermen, raftmen, and woodchoppers
971	Teamsters
972	Truck drivers' helpers
973	Warehousemen (n.e.c.)
979	Laborers (n.e.c.)

995	OCCUPATION NOT REPORTED
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¹ Mine laborers are included in the major group "Operatives and kindred workers."

QUESTIONS 23, 23b, and 23c - MICROENVIRONMENT CODES

Indoors, unspecified	100
Indoors, home, unspecified	110
Family room, den	111
Kitchen	112
Dining room or area	113
Living room	114
Bedroom	115
Bathroom	116
Laundry room, utility room, workshop	117
Garage (or enclosed carport)	118
Other room	119
Indoors, work, unspecified	120
Office (Clerical or administrative)	121
Work area (e.g., assemblyline, shop, warehouse)	122
Lunch room or break area	123
Rest room or locker room	124
_____	125
_____	126
_____	127
Indoors, public places, unspecified	130
Restaurant	131
Store, post office, barbershop	132
Shopping mall	133
Office	134
Church	135
School	136
Bar or night club	137
Health care facility (e.g., hospital, doctor's office)	138
Auditorium	139
Dance hall	140
Bowling alley	141
Indoor gymnasium or swimming facility	142
Public garage (enclosed parking structure)	143
Service station or auto repair facility	144
Other repair shop	145
Home of a friend	146
Meeting hall or lodge, clubhouse	147

Hotel or motel room	148
Library	149
Court	150
_____	151
_____	152
_____	153
_____	154
_____	155
 Outdoors, unspecified	 200
Around the house (e.g., yard, patio outside house, within building areas but not in own unit)	210
Within ten yards of active roadway	211
Parking lot or non-enclosed carport	212
Service station or motor vehicle repair service	213
Park, golf course, or other outdoor recreation area (e.g., beach, tennis courts)	214
Restaurant patio	216
Restaurant, drive-in area	217
Sports arena, stadium, amphitheater	218
Bike path	219
Outdoor store (e.g., lumber yard, nursery)	220
_____	221
_____	222
_____	223
_____	224
_____	225
Outdoor work location	230
Truck yard	231
 In Transit, unspecified	 300
Personal Automobile	310
Truck	311
Bus	312
Motorcycle	313
Walking	314
Bicycle	315
Jogging or brisk walk for exercise	316
SOHC van (Used to transport subjects to and from UCI)	317
Motor home	318
Diesel truck	320
_____	321
_____	322
_____	323

QUESTION 24. QUESTION 24b. and QUESTION 24c - ACTIVITY CODES

Three-digit classification scheme obtained from John Robinson, University of Maryland. The coding system was developed at the University of Michigan, Survey Research Center, and is an extension of the two-digit scheme used in the Multinational Time-Budget Research Project (Szalai, 1972).

August 1, 1985

ACTIVITY CODES FOR HOUSEHOLD TIME DIARIES

** 2 asterisks next to an activity code indicates
the code is to be used in coding children's
diaries only.

00: NO ACTIVITY
000 No Activity Reported

WORK AND OTHER INCOME PRODUCING ACTIVITIES

01: WORK

011 Main job: activities at the main job, travel which is part of the job, and overtime; "working", "at work".

012 Work at home; work activities for pay done in the home when home is the main workplace. (Include travel as 011.)
i.e.- Self-employed people running a business out of the home.

013 Additional work home; additional job (i.e. consulting, cottage industry)

014 Work at home for no pay, work connected with main job.

015 Other work at home - general

016 Reading (work brought home)
(formerly 944*)

02: UNEMPLOYMENT

022 Job search; looking for work, including visits to employment agencies, phone calls to prospective employers, answering want ads.

023 Unemployment benefits; applying for or collecting unemployment compensation.

024 Welfare; food stamps; applying for or collecting welfare food stamps.

05: SECOND JOB

059 Other paid work; second job; paid work activities which are not part of the main job (use this code when R clearly indicates a second job or "other" job); paid work for those not having main job; garage sales, rental property.

(CHILD DEFINITION) Part-time jobs when R is full-time student.

06: EATING

068 Eating while working; smoking, drinking coffee as a secondary activity while working (at work place)

069 Lunch at workplace; lunch eaten at work, cafeteria lunchroom when "where" = work (lunch at a restaurant, code 449; lunch at home, code 439)

07: ACTIVITIES AT WORK

078 Activities before or after work; activities at the workplace before starting or after stopping work; include - "conversations," other work. Do not code secondary activities with this primary activity.

079 Other work related

08: BREAKS

089 Coffee breaks and other breaks at the workplace; breaks during non-work during work hours at the workplace; "took a break"; "had coffee: (as a primary activity). Do not code secondary activities with this primary activity.

09: TRAVEL RELATED TO WORK ACTIVITIES

097 Travel related to job search, unemployment benefits, welfare, food stamp, waiting for related travel.

098 Interrupted travel to work; travel to and from workplace when R's trips to and from work were both interrupted by stops; waiting for related travel.

099 Travel to and from workplace, including time spent waiting for transportation.

HOUSEHOLD ACTIVITIES

10: FOOD

- 108 Meal preparation; cooking, fixing lunches
- 109 Serving food, setting table, putting groceries away, unloading car after grocery shopping.

11: CLEANUP

- 118 Doing dishes, rinsing dishes, loading dishwasher
- 119 Meal cleanup, clearing table, unloading dishwasher

12: CLEANING

- 128 Miscellaneous "work around house"; NA if indoor or outdoor
- 129 Routine indoor cleaning and chores, picking up, dusting, making beds, washing windows, vacuuming, "cleaning," "fall/spring cleaning," "housework".

13: OUTDOOR CLEANING

- 139 Routine outdoor cleaning and chores; yard work, raking leaves mowing grass, garbage removal, snow shoveling, putting on storm windows, cleaning garage, cutting wood.

14: CLOTHES CARE

- 148 Washing clothes
- 149 Other clothes care

16: REPAIRS

- 161 Indoor repairs, maintenance, fixing, furnace, plumbing, painting a room.
- 162 Outdoor repairs; maintenance, exterior; fixing repairs outdoors, painting the house, fixing the roof, repairing the driveway (patching).
- 163 Routine car care; necessary repairs and routine care to cars; tune up.

- 164 Home improvements; additions to and remodeling done to the house garage; new roof.
- 165 Repairing appliances
- 166 Repairing furniture
- 167 Car maintenance; changed oil, changed tires, washed cars; heavier maintenance "worked on car" except when clearly as hobby -- (code 832)
- 168 Improvements to grounds around house; repaved driveway

17: PLANT CARE

- 171 Gardening; flower or vegetable gardening; spading, weeding, composting, picking, "worked in garden".
- 173 Care of house plants

18: PET CARE

- 188 Play with animals
(formerly 844*)
- 189 Care of household pets

19: OTHER HOUSEHOLD

- 191 Other indoor chores; NA whether cleaning or repair
- 192 Other outdoor chores; "worked outside," "puttering in garage"
- 193 Household paperwork; paying bills, balancing the check-book, making lists, getting mail, working on the budget
- 194 ** Watching another person do typically female household tasks (108, 109, 118, 119, 148, 149)
- 195 ** Watching another person do typically male household tasks
- 196 ** Watching another person do household tasks, not listed above
- 197 Other household chores; (no travel), picking up things at home, e.g., "picked up deposit slips" (related travel to purpose)

CHILD CARE

20: BABY CARE

209 Baby care; care to children age 4 and under

21: CHILD CARE

218 Child care; mixed ages or NA ages of children

219 Care to children ages 5 - 17

22: HELPING/TEACHING

221 Helping/teaching children learn, fix, make things;
helping son bake cookies; helping daughter fix bike

222 Helping kids with homework or supervising homework

23: TALKING/READING

236 Giving child orders or instructions; asking them to help; telling
them to behave

237 Disciplining child; yelling at kids, spanking children

238 Reading to child

239 Conversations with household children only; listening to children

24: INDOOR PLAYING

248 ** Playing with babies aged 0-2; "playing with baby," indoors or
outdoors

249 Indoor playing with kids; other indoor activities with children
including games ("playing" unless obviously outdoor games)

25: OUTDOOR PLAYING

258 Leading outdoor activities; coaching, non-organizational activities

259 Outdoor playing with kids; including sports, walks, biking with,
other outdoor games

26: MEDICAL CARE - CHILD

269 Medical care at home or outside home; activities associated with children's health; "took son to doctor", "gave daughter medicine"

27: OTHER CHILD CARE

277 Co-ordinating child's social or instructional non-school activities (travel related code 298)

278 Babysitting (unpaid) or child care outside R's home or to children not residing in HH

279 Other child care, including phone conversations relating to child care other than medical

29: TRAVEL RELATED TO CHILD CARE

298 Travel related to non-school activities

299 Other travel related to child care

OBTAINING GOODS AND SERVICES

30: EVERYDAY SHOPPING

- 301 Shopping for food
- 302 Other shopping; including for clothing, small appliances;
at drug stores, hardware stores, department stores, "downtown"
or "uptown", shopping center, buying gas, window shopping

31: DURABLE/HOUSE SHOP

- 311 Shopping for durable goods; shopping for large appliances, cars
furniture
- 312 Shopping for house or apartment; activities connected by buying,
selling, renting, looking for house, apartment, including phone
calls; showing house, including traveling around looking at real
estate property (for own use)

32: PERSONAL CARE SERVICES

- 320 Phone calling for goods
- 321 Phone calling for services
- 329 Personal care services; beauty, barber shop; hairdressers

33: MEDICAL APPOINTMENTS

- 339 Medical care for self

34: GOVT/FINANCIAL SERVICES

- 341 Financial services; activities related to taking care of financial
business; going to the bank, paying utility bills (not by mail)
going to accountant, tax office, loan agency, insurance office
- 342 Other government services; post office, driver's license, sporting
licenses, marriage licenses, police station

35: REPAIR SERVICES

- 351 Auto services; repair and other auto services including waiting
for such services

- 352 Clothes repair and cleaning; cleaners, laundromat, tailor
- 353 Appliance repair; including furnace, water heater, electric or battery operated appliances; including watching repair person
- 354 Household repair services; including furniture; other repair services NA type; including watching repair person

36: LIBRARY

- 360 Time spent at library
- 361 Travel to/from library
- 369 ** Getting gifts or money from adult, e.g. got lunch money

37: OTHER SERVICES

- 377 Other professional services; lawyer, counseling (therapy)
- 379 Other services; "going to the dump"

38: ERRANDS

- 389 Running errands; NA whether for goods or services; borrowing goods

39: TRAVEL RELATED TO GOODS AND SERVICES

- 399 Travel related to obtaining goods

PERSONAL NEEDS AND CARE

40: WASHING/DRESSING

- 408 Bathing; washing, showering
- 409 Personal Hygiene; getting dressed, packing and unpacking clothes, going to the bathroom

41: MEDICAL CARE

- 411 Medical care at home to self
- 412 Medical care to adults in HH

42: HELP AND CARE

- 421 Non-medical care to adults in HH; routine non-medical care to adults in household; "got my wife up," "ran a bath for my husband"
- 422 Help to relatives not in HH; helping caring for, providing for needs of relatives; (except travel) helping move, bringing food, assisting in emergencies, doing housework for relatives; visiting when sick
- 423 Help to neighbors, friends
- 424 Help and to others, NA relationship to R; (same as 422 for others)

43: MEALS AT HOME

- 439 Meals at home; including coffee, drinking, smoking, food from a restaurant eaten at home, "breakfast," "lunch"

44: MEALS OUT

- 448 Meals at friend's home; eaten at a friend's home (inc. coffee, drinking, smoking)
- 449 Meals at restaurants

45: NIGHT SLEEP

- 458 Longest sleep of the day; including in bed but not asleep (formerly 459*)

459 Beginning of longest sleep of next night, night sleep
(formerly 460*)

46: NAPS/SLEEP

469 Naps and resting

48: N.A. ACTIVITIES

481 Time gap of more than 10 minutes

482 Personal/private; "none of your business"

483 Sex, making out

484 Affection between household members: giving and getting hugs
kisses, sitting on laps

485 Interview/ questionnaire; completing time diaries
(formerly 978*)

487 ** At babysitters before and after school or if child does not
attend school. (NOTE: all secondary activities should be coded
when this is a primary activity).

488 ** Receiving child care; child is passive recipient of personal
care; e.g. "Mom braided my hair"

489 Other personal care activities; watching personal care activities

49: TRAVEL RELATED TO PERSONAL CARE

498: Travel related to helping, related to codes 421, 422, 423,
424, including travel which is the helping activity; waiting
for related travel

499 Other personal travel

EDUCATION AND PROFESSIONAL TRAINING

50: STUDENTS' CLASSES

- 500 Television-based education
- 509 Student attending classes full-time; includes daycare, nursery school for children not in school

51: OTHER CLASSES

- 519 Other classes, courses, lectures, academic or professional;
R not a full time student or NA whether a student; being tutored

54: HOMEWORK

- 548 Reading (class related)
(formerly 945*)
- 549 Homework, studying, research

56: OTHER EDUCATION

- 568 ** At day care/nursery before or after school only (NOTE: all secondary activities should be coded when this is a primary activity)
- 569 Other education

59: TRAVEL RELATED TO EDUCATION

- 597 ** Travel directly from home to school
- 598 ** Travel directly from school to home

(NOTE: 597 and 598 are child codes only)
- 599 Other school-related travel; waited for related travel; travel to school not originating from home

ORGANIZATIONAL ACTIVITIES

60: PROFESSIONAL/UNION ORGANIZATIONS

- 601 Meetings of professional/union groups
- 602 Other activities, professional/union group including social activities and meals

61: SPECIAL INTEREST IDENTITY ORGANIZATIONS

Includes groups based on sex, race, national origin; NOW, NAACP, Polish-American Society, neighborhood, block organizations, CR groups, senior citizens, Weight Watchers, etc

- 611 Meetings of identity organization
- 612 Other activities, identity organizations and special interest groups, including social activities and meals

62: POLITICAL PARTY AND CIVIC PARTICIPATION

- 621 Meetings political/citizen organizations; including city council
- 622 Other activities, political/citizen organizations, including social activities, voting, jury duty, helping with election, and meals

63: VOLUNTEER/HELPING ORGANIZATIONS

Hospital volunteer group, United Fund, Red Cross, Big Brother/Sister

- 631 Attending meetings of volunteer, helping organizations
- 632 Officer work; work as an officer of volunteer, helping organizations, R must indicate he/she is an officer to be coded here
- 633 Fund raising activities as a member of volunteer helping organization, collecting money, planning a collection drive
- 634 Direct voluntary help as a member of volunteer group; visiting bringing food, driving
- 635 Other volunteer activities, including social events and meals

64: RELIGIOUS PRACTICE

- 641 Meetings of religious helping groups; ladies aid circle, missionary society, Knights of Columbus
- 642 Other activities of religious helping groups listed in 641 including social activities and meals
- 643 Meetings, other church groups; attending meetings of church groups which are not primarily helping oriented or NA if helping oriented
- 644 Other activities, other church groups; other activities as a member of church groups which are not helping oriented or NA if helping, including social activities and meals; choir practice; bible class

65: RELIGIOUS PRACTICE

- 651 Attending services of a church or synagogue, including participating in the service; ushering, singing in choir, leading youth group, going to church, funerals
- 652 Individual practice, or religious practice carried out in a small group; praying, meditating, Bible study group (not at church), visiting graves

66: FRATERNAL ORGANIZATIONS

Moose, VFW, Kiwanis, Lions, Civitan, Chamber of Commerce, Shriners
American Legion

- 661 Meetings fraternal organizations
- 662 Other activities as a member of a fraternal organization including social activities and helping activities and meals

67: CHILD/YOUTH/FAMILY ORGANIZATIONS

- 671 Meetings, family/youth/child organizations
- 672 Other activities as a member of child/youth/family organizations including social activities and meals

68: OTHER ORGANIZATIONS

- 688 ** Meetings practices for team sports
(formerly 883* and 884*)
- 689 Other organizations; any activities as a member of an organization not fitting into above categories; (meetings and other activities included here)

69: TRAVEL RELATED TO ORGANIZATIONAL ACTIVITY

- 698 Travel related to organizational activities as a member of a volunteer organization; including travel which is the helping activity, waiting for related travel
- 699 Travel related to all other organizational activities; waiting for related travel

ENTERTAINMENT/SOCIAL ACTIVITIES

70: SPORT EVENTS

- 708 Watch other people do active leisure activities
(formerly 882*)
- 709 Attending sports events

71: MISCELLANEOUS EVENTS

- 719 Miscellaneous spectacles, events; circus, fairs, rock concerts,
accidents

72: MOVIES

- 729 Attending movies; "went to the show"

73: THEATRE

- 739 Theatre, opera, concert, ballet

74: MUSEUMS

- 749 Attending museums, zoos, art galleries, exhibitions

75: VISITING

- 752 Visiting with others; socializing with people other than R's
own HH members either at R's home or another home (visiting
on the phone, code 965); talking/chatting in the context of
receiving a visit or paying a visit

76: PARTIES

- 768 Picnicking (* new code)
- 769 Party, reception, wedding

77: BARS/LOUNGES

- 771 At bar, cocktail lounge, nightclub; socializing or hoping to
socialize at bar, lounge
- 772 Dancing

78: OTHER EVENTS

789 Other events, of socializing that do not fit above

79: TRAVEL RELATED TO EVENTS/SOCIAL ACTIVITIES

799 Related travel; waiting for related travel

SPORTS AND ACTIVE LEISURE

80: ACTIVE SPORTS

- 800 Lessons in sports ; (formerly 885*)
swimming, golf, tennis, skating, roller skating (codes 801 - 807,
811 - 817, 821 - 826)
- 801 Football, basketball, baseball, volleyball, hockey, soccer,
field hockey
- 802 Tennis, squash, racquetball, paddleball
- 803 Golf, miniature golf
- 804 Swimming, waterskiing
- 805 Skiing, ice skating, sledding, roller skating
- 806 Bowling, pool, ping pong, pinball
- 807 Frisbee, catch
- 808 Exercises, yoga, weightlifting
- 809 Judo, boxing, wrestling

81: OUTDOORS

- 811 Hunting
- 812 Fishing
- 813 Boating, sailing, canoeing
- 814 Camping, at the beach
- 815 Snowmobiling, dune-buggies
- 816 Gliding, ballooning, flying
- 817 Excursions, pleasure drives (no destination), rides
with the family

82: WALKING/BIKING

- 821 Walking for pleasure
- 822 Hiking

- 823 Jogging, running
- 824 Bicycling
- 825 Motorcycling
- 826 Horseback riding

83: HOBBIES

- 831 Photography
- 832 Working on cars -- not necessary to their running; customizing, painting
- 833 Working on leisure time equipment repair (repairing the boat, "sorting out fishing tackle")
- 834 Collections, scrapbooks
- 835 Carpentry, woodworking
- 836 Making movies (formerly 925*)

84: DOMESTIC CRAFTS

- 841 Preserving foodstuffs (cleaning, pickling)
- 842 Knitting, needle-work, weaving, crocheting (including classes), crewel, embroidery, quilting, quilling, macrame
- 843 Sewing

85: ART/ LITERATURE

- 851 Sculpture, painting, potting, drawing
- 852 Literature, poetry, writing (not letters), writing a diary

86: MUSIC/DRAMA/DANCE

- 860 Other lessons; (formerly 888*)
(831-835, 841-844, 851-852, 871-888)
- 861 Playing a musical instrument, (include practicing), whistling
- 862 Singing
- 863 Acting (rehearsal for play)

- 864 Non-social dancing; ballet, modern dance, body movement
- 865 Gymnastics
- 866 Pretend, dress-up
- 867 Lessons in music, dance, gym, judo, singing, body movement
(formerly 886*, and 887*)
(808-809, 864-865, 861-863)
- 869 Other active leisure; "hanging around"
(formerly 889*)

87: GAMES

- 871 Playing card games (bridge, poker)
- 872 Playing board games (Monopoly, Yahtzee, Bingo, Dominoes, Trivial Pursuit)
- 873 Playing social games (scavenger hunts), "played games"-- NA kind
- 874 Puzzles
- 875 Played with toys
- 876 Played outdoors
- 877 Played indoors

88: COMPUTER USE

- 884 Using computer - general
(formerly 894*)
- 885 Computer use for education
(formerly 895*)
- 886 Computer games - child
(formerly 896*)
- 887 Computer games - adult
(formerly 897*)
- 888 Other computer use; (formerly 898*)
- 889 Other active leisure

89: TRAVEL RELATED TO ACTIVE LEISURE

- 899 Related travel

PASSIVE LEISURE

90: RADIO USE

900 Radio transmitting/CB radio
(formerly 910*)

909 Radio use

91: TV USE

914 VCR/Home Movies
(formerly 920*)

918 Cable TV

919 TV viewing

92: RECORDS/TAPES

926 Recording music (formerly 930*)

927 Records

928 Tapes

929 Records, tapes, stereo, listening to music, listening to
others playing a musical instrument

93: READ BOOKS

939 Reading books for pleasure

94: READING MAGAZINES/NA

941 Reading magazines, reviews, pamphlets

942 Reading NA what; or other

943 ** Being read to

95: READING NEWSPAPER

959 Reading newspaper (formerly 949*)

96: CONVERSATIONS

- 960 ** Receiving instructions
(formerly 967*)
- 961 ** Being disciplined; (formerly 966*)
- 962 Other talking/ arguing with non-HH members
(formerly 962* & 964*)
- 963 Conversations/arguing with HH members
(formerly 965* & 963*)
- 964 Local calls placed
(formerly 957*)
- 965 Local calls received
(formerly 958*)
- 966 Long distance call placed
(formerly 959*)
- 967 Long distance call received
(formerly 960*)
- 968 Telephone use for organizational activities
- 969 Other phone conversations (formerly 961*)

97: LETTERS

- 977 Typing; (formerly 980*)
- 979 Letters, (reading or writing) reading mail

98: OTHER PASSIVE LEISURE

- 981 Relaxing
- 982 Thinking, planning, reflecting
- 983 Doing nothing
- 984 Activities of others reported
- 989 Other passive leisure; smoking dope, pestering, teasing,
joking around, messing around, laughing

99: TRAVEL RELATED TO PASSIVE LEISURE

- 997 ** Waiting in car for adult

- 998 ** Travel of child with adult when not clear whether child participated in adult's purpose of trip--e.g. went to bank (with parent) and waited in car; code travel portion 998
- 999 Related travel; waiting for related travel

EXAMPLES OF ACTIVITIES IN "OTHER" CATEGORIES

079 OTHER WORK RELATED

Foster parent activities

197 OTHER HOUSEHOLD

Wrapping presents
Checked refrigerator for shopping list
Unpacked gifts from shower
Packing/Unpacking car
"Settle in" after trip
Hook up boat to car
Showed wife car (R was fixing)
Packing to move
Moved boxes
Looking/searching for things at home (inside or out)

279 OTHER CHILD CARE

Waited for son to get hair cut
Picked up nephew at sister's house
"Played with kids" (R's children from previous marriage
not living with R)
Called babysitter

379 OTHER SERVICES

Left clothing at Goodwill
Unloaded furniture (just purchased)
Returned books (at library)
Brought clothes in from car (after laundromat)
Delivered some stuff to a friend
Waited for father to pick up meat
Waited for stores to open
Put away things from swap meet
Sat in car waiting for rain to stop before shopping
Waiting for others while they're shopping
Showing Mom what I bought

489 OTHER PERSONAL

Waiting to hear from daughter
Stopped at home, NA what for
Getting hysterical

Breaking up a fight (not child care related)
Waited for wife to get up
Waiting for dinner at brother's home
Waiting for plane (meeting someone at airport)
Laughing
Crying
Moaning -- head hurt

569 OTHER EDUCATION

Watched a film
In discussion group

689 OTHER ORGANIZATION

Attending "Club House coffee klatch"
Waited for church activities to begin
"Meeting" NA kind
Cleanup after banquet
Checked into swap meet -- selling and looking

789 OTHER SOCIAL, ENTERTAINMENT

Waiting for movies, other events
Opening presents (at a party)
Looking at gifts
Decorating for party
Tour of a home (friends or otherwise)
Waiting for date
Preparing for a shower (baby shower)
Unloaded uniforms (for parade)

889 OTHER ACTIVE LEISURE

Fed birds, bird watching
Astrology
Swinging
At park
Showing slides
Showing sketches
Hung around airport (NA reason)
Picked up fishing gear
Inspecting motorcycle
Arranging flowers
Worked on model airplane
Picked up softball equipment
Registered to play golf
Toured a village or lodge

989 OTHER PASSIVE LEISURE

Lying in the sun
Listening to birds
Looking at slides
Stopped at excavating place
Looking at pictures
Walked around outside
Waiting for a call
Watched plane leave
Girl watching/boy watching
Watching boats
Wasted time
Inside and outside of the house

**QUESTION 30a QUESTION 30b AND QUESTION 33b - DOLLAR AMOUNTS
WILLING TO PAY**

If the subject answered that they would be willing to pay an "infinite amount" or "pay with everything I have", then the dollar amount in Q30AAVD1, Q30BAVD2, and Q33PAY was coded "all 9's", e.g. 99999999. If the subject answered they would pay something but did not know how much, the dollar amount was coded "-1".

**QUESTION 30a AND QUESTION 33 - ADDITIONAL COMMENTS OFFERED
BY SUBJECT CODES**

- 1 = Subject answered \$0.00 and stated "could not afford anything".
- 2 = Subject answered "would pay what could afford on limited income" and usually offered a dollar amount.
- 3 = Subject answered large dollar amount and stated "would pay with everything I have".
- 4 = Other comment.

QUESTION 32 - WILLINGNESS-TO-PAY TREATMENT CODES

<u>TREATMENTS</u>	<u>EPISODES</u>	<u>DOLLAR AMOUNTS</u>		
1	4	5	50	200
2	8	5	50	200
3	4	10	25	50
4	8	10	25	50
5	4	25	50	100
6	8	25	50	100
7	4	50	100	200
8	8	50	100	200
9	4	100	200	400
10	8	100	200	400
21	4	10	50	200
22	8	10	50	200
23	4	25	100	300
24	8	25	100	300
25	4	50	200	400
26	8	50	200	400
27	4	100	500	1000
28	8	100	500	1000

Treatments 1-10 were randomly assigned to the twenty subjects in the first mailing of questionnaires in early April 1986. After completing 15 of the 20 interviews, ERC and UCI reviewed the success of the dollar amounts in bracketing the range of observed responses, and a revised treatment schedule was formulated on May 8, 1986. The revised schedule, Treatments 21-28, was used for the remainder of the subject pool.

An additional adjustment was made at the time of this revision. It was decided that Questions 30a and 30b should be asked out of sequence, after completion of Questions 32 and 33. A third digit was added to the Treatment Code to indicate this change of sequence. If Questions 30a and 30b were asked in sequence after completing the line of inquiry on the "typical recent" angina episode, the third digit of the treatment code was assigned a "1". If Questions 30a and 30b were asked after the willingness-to-pay Questions 32 and 33, then the third digit of the treatment code was assigned a "2".

For example, Treatment Code 242 represents Treatment 24 (8 episodes; \$25, \$100, and \$300) and Questions 30a and 30b were asked after completing Questions 32 and 33. (Note that this change in sequence was instituted immediately and several individuals in the first treatment schedule were interviewed using the adjusted sequence of waiting to ask Questions 30a and 30b.)

QUESTION 35 - REASON FOR DOCTOR NOT RECOMMENDING CABG CODES

- 1 = In physician's opinion, the subject was not a candidate because of the low chance of surviving the CABG surgery (e.g., "not a good candidate for surgery").
- 2 = Physician recommended alternative medical treatment or angioplasty.
- 3 = Other (including "never talked about it")

QUESTION 35a - REASON FOR NO CABG SURGERY AFTER POSITIVE DOCTOR'S RECOMMENDATION CODES

- 1 = In subject's opinion, CABG surgery was too great at risk.
- 2 = Subject chose alternative medical treatment or angioplasty.
- 3 = Subject refused CABG surgery (e.g., believed "not necessary" or "too expensive").
- 4 = Other

EPA CHD COMMENTS
QUESTION 1

001HA 2 YEARS AGO
083JS EXERCISE, LIFTING ARMS ABOVE WAIST
042JT HEAVINESS IN CHEST
022CE NALOX, MYLANTA, GAS, ALWAYS RELIEVES DISCOMFORT. NITRO
ALSO WORKS. PAUSES & RESTS & TAKES MYLANTA.

QUESTION 2

108JA SOMETIMES
001HA 2 YEARS AGO, UPSTAIRS, WORKING IN YARD, STOP & CATCH
BREATH
083JS SHORTNESS OF BREATH TOO

QUESTION 3

023WF BUT MILD
107JS NOT CURRENTLY
039HK RARELY
052HR OCCASIONALLY
012JB SOMETIMES
025JF SOMETIMES
043VL USUALLY EXERTION
050EP PULSE RATE SLOWS DOWN, WEAK, BEND OVER
001HA LAST TMST AT VA. MIGHT HAVE TO HAVE BYPASS. HAD
ANGIOGRAM, SPENT 2 WEEKS IN HOSPITAL
083JS CAN ONLY REMEMBER 3 OR 4 TIMES. TOOK NITRO RIGHT AWAY.
042JT EVEN BICYCLE DOES NOT BRING ON NOW.

QUESTION 4

023WF WHEN FIRST STARTED SUBJECT BELIEVED IT WAS INDIGESTION--
1973, ST MARY'S
043VL SOMETIMES
042JT BEFORE CABG SURGERY

QUESTION 5

091IM LAST EPISODE WAS ABOUT 1 YEAR AGO
050EP HEADACHE. SHOULDER DOWN THE ARM
001HA RECENTLY HAD LUNG TROUBLE, LUNG PROBLEM, FLUID IN LUNGS;
MEDICATION, DIGOXIN, 2 MONTHS, CONTINUE TO HAVE LUNG
PAIN

QUESTION ALT-6A

107JB 10 MONTHS--6/17/85
BACK TO 8 HOUR DAY AS SOON AS CAME HOME

QUESTION ALT-6B

091IM OTHER=RETIREMENT
050EP OTHER=JUST STOPPED
001HA "I DON'T KNOW, I'M NOT A DOCTOR"
052JT UPON EXERCISE. ANY EXERTION

QUESTION ALT-6D

091IM AFFECTED BREATHING -- PRESSURE--LAY DOWN, REST 30-45 MIN
HAD NITRO MED

QUESTION 6

082JM HAVE IT EACH EVENING, AFTER DINNER WHEN MOVING CARS
043VL "THE SEASONS DON'T DO ANYTHING FOR ME"
025JF IN SPRING GET OUT TO THE HIGH DESERT
015RC ANSWERS PERTAIN TO TIME SINCE SURGERY OCT '83
084EB DIFFICULT TO JUDGE BECAUSE VISIT MINNESOTA DURING WINTER
FOR WHILE. COLD & HEAT MAKES WORSE & MORE FREQUENT
100WC MORE FREQUENT IN SUMMER & SPRING
102JB HAPPENS SIX TIMES PER DAY
005CB SOMETIMES 3-4 TIMES PER MONTH. SOMETIMES NOT AT ALL.
DON'T NOTICE SEASONAL DIFFERENCE BUT DOES NOTICE
EXERCISE AND EMOTIONAL TIE
108JA INTERVIEWER NOTE: SUBJECT DOES NOT PAY ATTENTION,
CANNOT ANSWER
023WF SIT MORE THAN WORK, HEAVINESS & CHEST PAIN OCCUR IN
MORNING AFTER HAVING BEEN UP ABOUT 1 HR. INTERVIEWER
NOTE: SMOKER, DRINKS COFFEE BEFORE CIGARETTE.
107JB BEFORE SURGERY, COLD TEMPERATURE CAUSED ANGINA 3-4 TIMES
PER DAY
03PHK DURING WINTER 6-7 TIMES PER DAY
003GB BEFORE SURGERY HAD ANGINA ABOUT TWICE A MONTH IN
SUMMER
017LC MORE FREQUENT & SEVERE IN WINTER DUE TO COLD
001HA HAPPENS DURING WORK OR WALKING USUALLY
030RH ABOUT SAME ALL THROUGH YEAR
094PG SOME DIFFERENCE IN FREQUENCY
067SW PROBLEMS LATELY, JUST GOT BACK FROM VA
08TJB IN SUMMER, HEAT

QUESTION 7

080WR WHEN IN COLORADO ALTITUDE CAUSED PAIN IN CHEST WHICH
WOULD RADIATE TO THE THROAT. TOOK NITRO AND STOP
ACTIVITY TO RELIEVE. WAS WORSE THEN
100WC ALSO MORE SEVERE PAIN IN SUMMER AND SPRING
012JB WORSE ANGINA BETWEEN 3-7PM
005CB ALL EPISODES BY SEASON ARE MODERATE
075TS ANGINA LASTS FOR A FEW SECONDS (4-5 SECONDS)
030RH ALWAYS VERY MILD
094PB NO DIFFERENCE IN SEVERITY
033JB SUMMER IS CLOSER TO 6 THAN FALL AND WINTER
008JB WINTER HAS SOB, TAKE MORE NITRO
062JT MORE RELATED TO ACTIVITY, SENSITIVE TO EXERTION MORE
THAN SEASON
022CE TIREDNESS, HAVE NOT OUTRIGHT PAIN, BUT DOES GET "TIRED
FEELING" & "HEAVY FEELING" AND MUST SIT DOWN.

QUESTION 8

100WC ABOUT 1 DAY EACH WEEK, MY ARMS ARE NUMB, FEEL
LIGHTEADED AND HAVE CHEST PAIN. "TAKE NITRO, LAY DOWN,
GO TO SLEEP FOR SEVERAL HOURS. I'M OUT."
108JA 8 DAYS ALL RECENTLY
052HR 12 DAYS AT LEAST. LAST WEEK 1 DAY, WERE DOWN MOST OF
DAY
091IMO ZERO (0) DAYS EVEN WHEN HAD CHEST PAIN
107JB "MAY KEEP ME DOWN FOR 15-30 MINUTES, SEVERAL TIMES
DURING THE DAY, BUT DON'T LOSE AN ENTIRE DAY. I FACE
MYSELF. BEFORE SURGERY IN JUNE, 1985, WAS DOWN
EVERYDAY."
003GB 1 DAY, LAST SUMMER BEFORE SURGERY
017LC NORMALLY SPEND EVERYDAY INDOORS IN CHAIR
001HA "NOT EVEN WHEN I USED TO HAVE IT, NEVER HAD TO STAY
DOWN."
008JB STAND UP. LAYING DOWN OR SITTING PAIN WORSE, RADIATES
TO LEG & ARMS.
062JT BEFORE SURGERY NEVER LOST TIME FOR WORK OR ACTIVITIES.
TOOK A NITRO & RESUMED. NEVER LET IT GET HIM DOWN
MENTALLY.
022CE USUALLY REST FOR 30 MINUTES & GET UP AND RESUME
ACTIVITY

QUESTION 9A

024AF USED VA BENEFITS FOR HEART. USE FHP FOR OTHER ILLNESSES AND FOR WIFE
 084EB HAS MEDICARE BUT USES VA. WOULD PREFER MAYO CLINIC TO DO PTCA BUT DON'T THINK VA WOULD PAY
 009DB PRIVATE MEDICAL INSURANCE FROM AARP
 100WC ANSWERED MEDICARE BUT NOT OLD ENOUGH. RECODED AS MEDICAL
 021RE PRIVATE MEDICAL INSURANCE FROM AARP
 019LD HAVEN'T USED VA IN 5 MONTHS. WENT TO KAISER IN JANUARY, CHECKING INTO VA TOMORROW FOR ERECTION PROBLEMS
 023WF PRIVATE MEDICAL INSURANCE FROM AARP
 033RP PRIVATE MEDICAL INSURANCE FROM AARP
 107JB USE VA BENEFITS WHEN NECESSARY BUT THAT IS SELDOM
 MAINLY USE MEDICARE AND BLUE CROSS SUPPLEMENTARY (PRIVATE MEDICAL INSURANCE FROM BLUE CROSS SUPP.)
 003GB INTERVIEWER NOTE: INTERVIEWERS KNOW FROM PAST RESEARCH WITH SUBJECT THAT HE MAKES USE OF VA SERVICES WHICH PROVIDE 100% COVERAGE FOR HEART CONDITION
 046EM HEALTH MAINTENANCE PROGRAM FROM HORIZON INSURANCE. HIS DOCTOR BELONGS TO THIS GROUP, SO HE JOINED
 007FB PRIVATE MEDICAL INSURANCE IS METROPOLITAN AND MAXICARE
 083JB USES VA FOR HEART CONDITION
 062JT HOAG MEMORIAL HOSPITAL BILL WAS \$5000, \$2900 ANGIO-- SURGEON; \$800 BLOOD SUGAR CONSULTATION-ENDOCRINOLOGIST

QUESTION 9C

057RS FIRST \$1500 IN EACH YEAR MUST PAY HIMSELF FOR DR. OFFICE VISITS, OR EMERGENCY ROOM AND HOSPITAL SERVICES
 024AF "COULD GET ASPIRIN AT VA HOSPITAL BUT IT IS TOO STRONG FOR ME, SO I BUY MY OWN."
 009DB MEDICARE AND PRIVATE INSURANCE PAYS ALL OF MOST THINGS. MEDICARE 80%, AARP 20%. "OCCASIONALLY SOME ITEMS OR PORTIONS OF ITEMS ARE NOT COVERED AND I HAVE TO PAY FROM POCKET. IT IS VARIABLE, A DISGUSTING PROCESS."
 100WC "FOR DR. OFFICE VISIT, COVERED TO THE FIRST \$35. FOR EMERGENCY ROOM AND HOSPITAL, I HAVE 100% COVERAGE. PRESCRIPTIONS ARE 80% COVERAGE. IF NEEDED, HAVE 100% COVERAGE BY VA."
 021RE DOESN'T USE VA OFTEN
 106CA PRESCRIPTIONS COST \$15/MONTH, FLAT FEE
 013LD \$2.50 PER PRESCRIPTION
 006WB PETITIONED HMO TO USE UCIMC AND WAS GRANTED THAT LOCATION. MUST REQUEST TREATMENT FIRST TO BE COVERED OR PAY TOTAL COST HIMSELF. RECEIVES PRESCRIPTIONS FROM UCIMC PHARMACY BUT HAS NOT BEEN BILLED FOR ANY PRESCRIPTIONS YET. IF DUPLICATE, UNNECESSARY, OR SUPPLEMENTARY PROCEDURES ARE PERFORMED, COVERAGE CHANGES

033RH A WHILE AGO HAD TO PAY FULL COST OF PRESCRIPTIONS, NOW
JUST STARTING AARP
107JB \$7.00 PER REFILL
064DT PRESCRIPTION MEDS PROVIDED FREE OF CHARGE WHILE ON 20
WEEK EXPERIMENTAL PROGRAM CONDUCTED BY PFISER
103RM ACTUALLY HAS 100% COVERAGE AT VA BUT DOES NOT ALWAYS
USE
046EM SUBJECT PAYS \$2 FOR EACH DR. OFFICE VISIT AND EACH
PRESCRIPTION. HEALTH MAINTENANCE PROGRAM FROM HORIZON
007FB EMPLOYER PAYS FOR ALL COVERAGE

QUESTION 11

024AF SUBJECT IS CURRENTLY ON EXPERIMENTAL TREATMENT. SEEMS
TO BE A LITTLE MORE ACTIVE. TAKES CODED MEDICATIONS.
TOOK OFF ALL PREVIOUS MEDS AND NOW ON PROGRAM WHERE
NEITHER HE NOR HIS PERSONAL PHYSICIAN KNOW
MEDICATIONS (DOUBLE-BLIND)
084EB WHEN MEDS ARE CHANGED GO AN EXTRA TIME
009DB SUPPOSED TO GO TWO TIMES PER YEAR
021RE DR. INCLUDES ANY MEDS DISPENSED AT THAT TIME IN THE
\$20.00 PER VISIT
018LD STARTED KAISER (LOCATED IN FONTANA) IN JANUARY
051JR NO COST FOR A CHECKUP EXCEPT THAT OF TRAVEL/MILEAGE
030RH "ONCE THEY FOUND OUT THAT I DO NOT TAKE THEIR MEDICATION
THEN I WAS OFF THEIR PROGRAM -- HEART IS NOW ONLY
CHECKED AS PART OF A PHYSICAL EXAM ONCE EACH YEAR."
LAST REGULAR EXAM WAS IN AUGUST 1985, NO LONGER GOES TO
HEART CLINIC
046EM PAYS A \$2 FLAT FEE FOR EACH CHECKUP
008JB PCC EVERY SIX MONTHS
062JT NOT FOR HEART, BUT FOR DIABETES 3 TIMES/YR
022DE ONCE PER WEEK NOW; ONCE EVERY SIX WEEKS BEFORE COUMADIN

QUESTION 12

084EB FOR A CHECK ON HOW MEDS ARE REGULATING
009DB STILL TRYING TO SETTLE. STILL GETTING BILLS, BUT WON'T
PAY UNTIL HAVE BATTLED INSURANCE CO. AND MEDICARE
100WC "THE LAST OFFICE VISIT COST \$497; DON'T KNOW MY PART
YET, BUT IN THE PAST INSURANCE HAS PAID ALL."
005CB "NO VISITS IN PAST 12 MONTHS, BUT AM GOING TOMORROW FOR
ANGINA -- MADE APPOINTMENT."
052HR ONE VISIT WAS FOR ANGIOPLASTY AND ONE WAS FOR ANGINA -
SPENT SEVERAL DAYS IN HOSPITAL
006WB HAVE NOT RECEIVED BILL YET
037CK SHORTNESS OF BREATH PROBLEMS; BELIEVED TO BE RELATED TO
HEART
001HA TURNED OUT TO BE LUNG PAIN AND NOT THE HEART
000WH PRESCRIPTIONS RAN OUT AND HAD TO HAVE CHECKUP BEFORE
PRESCRIPTION RENEWAL

QUESTION 15

103RM NEXT TO LAST EMERGENCY ROOM COST WAS \$1214 (COMMUNITY
HOSPITAL), BUT THE LAST WAS \$0 (VA)
088EP "I DO NOT KNOW THE COST OF MY LAST EMERGENCY ROOM VISIT;
BUT KNOW IN THE FUTURE MY INSURANCE COMPANY WILL BE
CHARGED \$77 PER EMERGENCY ROOM VISIT."

QUESTION 16

083JS IF HANDLE RIGHT DON'T HAVE PROBLEMS AND CAN AVOID
SEVERE PAIN. "HAVE LEARNED ABOUT HOW MUCH I CAN DO."
062JT HOME--CALISTHENICS & STRETCHING, RIDING BIKE

QUESTION 17

080WR PERSONAL PROGRAM OF WALKING FOR EXERCISE. WALKS TO
IMPROVE HEART CONDITION AND REMAIN FIT
057RS "BICYCLE IS THE ONLY THING I HAVE PURCHASED."
024AF WALKS 2 MILES EACH DAY VERY SLOWLY
084EB "EXERCISE BIKE PROVIDED -- DO OCCASIONALLY, BUT NOT LIKE
I SHOULD."
018LD HAD MANY TESTS BECAUSE TRANSFERRING SELF TO KAISER
RATHER THAN USE LONG BEACH VA. WANTS TO GET RECORDS
TRANSFERRED. HAD UPPER GI, 2 ECG'S, ECHOGRAM ALL AGAIN
AT KAISER
052HR JUST WALKING
006WB SUBJECT ALSO INCURRED \$250 INITIATION FEE PAID 18 MOS.
AGO AT LOCAL HEALTH CLUB/SPA
023WF SUBJECT DID HAVE THERAPY FOR LEG AND BACK INJURIES
SUSTAINED IN AUTO ACCIDENT
033RH SUBJECT DID PURCHASE AN EXERCYCLE FOR \$100 2-3 YEARS
AGO
107JB SUBJECT ALREADY HAD EXERCISE BIKE; IT WAS PURCHASED
SEVERAL YEARS AGO. PURCHASED NO SHOES OR CLOTHING.
WALKS 3 MILES DAILY IN EARLY MORNING. DOES SOMETIMES
RIDE THE EXERCYCLE
079LB BOUGHT EXERCYCLE LONGER THAN 12 MONTHS AGO
039HK WENT TO SEE ABOUT HAVING BALLOON INSERTED IN STOMACH TO
HELP LOSE WEIGHT. NOT ABLE TO BECAUSE OF FAST STOMACH
AND INTESTINAL SURGERY. NO COST. WOULD HAVE HAD TO PAY
IF HAD BEEN ABLE TO HAVE THE SURGERY
051JR SUBJECT CITES COST OF CLOTHING, SHOES, AND DRIVING TO
AREA WHERE CAN WALK
032WH SUBJECT WAS TOLD TO WALK AND WAS GIVEN EXERCISES TO DO

QUESTION 18

080WR OTHER=ALTITUDE
015RC PRIMARY FACTOR IS EXERTION, SECONDARY IS STRESS AND ANXIETY
084EB OTHER=HIGH ALTITUDE AND HIGH HUMIDITY. LAST SUMMER BUSSED THROUGH DENVER. HIGH ALTITUDES, HAD TO HYPERVENTILATE. HOT HUMID WEATHER---HARD. ALSO NOTICED AIR POLLUTION TO BE MORE OF A FACTOR IN THE LAST YEAR OR SO.
100WC POST-INTERVIEW COMMENTS: "AIR POLLUTION DOES BOTHER ME AT TIMES BUT AROUND MY HOUSE IN SAN JUAN CAPISTRANO WE JUST DON'T HAVE IT (AIR POLLUTION). BUT IT DOES BOTHER ME AND IT CAN BRING ON ANGINA. I DON'T GO TO L.A., THEREFORE I DO NOT GENERALLY ASSOCIATE AIR POLLUTION WITH ANGINA."
012JB OCCASIONALLY STRESS OR ANXIETY AND EXCITEMENT
025HR COLD TEMPERATURE CAUSED ANGINA ON A TRIP TO OREGON A COUPLE OF YEARS AGO
023WF AIR POLLUTION IS A FACTOR, RECALLED CLEAN AIR IN LONG BEACH YEARS AGO, FELT BETTER. CIGARETTE SMOKE IS A FACTOR, TO SAY NO WOULD BE STUPID. OCCASIONALLY HAVE PAIN AFTER MEALS, USE SELTZER WATER TO RID--GAS PAIN. USUALLY RELAX AND IT PASSES
050EP MEALS A FACTOR IF ATE TOO MUCH
051JR OTHER=NOT HAVING REGULAR MEALS
086GS MEALS ARE SOMETIMES A FACTOR. OTHER=INDIGESTION DUE TO MEDICATIONS
017LC COLD BEVERAGES LIKE ICE WATER AND ICE TEA BRING ON ANGINA
106BD OTHER=ANGER
067SW PHYSICAL EXERTION SUCH AS WALKING AND DANCING FAST
046EM "MEALS ARE A FACTOR BUT MOSTLY GAS; HAD TO GET PRESCRIPTION LAST TIME -- THREE DAYS 'TIL WELL."
032WH "STRESS OR ANXIETY IS A FACTOR BECAUSE I CANNOT DO THE THINGS I WANT TO."
083JS "STRESS OR ANXIETY, IRRITATION, EVEN WHEN OTHERS ARGUE."

QUESTION 19

080WR OTHER=TRY TO TAKE MIND OFF OF THINGS
043VL OTHER=JUST TAKE NITRO AND CONTINUE
084EB NO YARD-LIVE IN APARTMENT
005CS OTHER=DRIVE INSTEAD OF WALK

023WF DO THE SAME ACTIVITIES BUT AT A SLOWER PACE. "MY ACTIVITIES HAVE CHANGED DUE TO BACK AND LEG INJURIES INCURRED IN CAR ACCIDENT -- NO GOLF OR BOWLING. AVOID EMOTIONAL STRESS -- AVOID ARGUMENTS OF ANY KIND. AVOID EXPOSURE TO HOT WEATHER. TO DECREASE MY OWN SMOKING BEHAVIOR I KEEP MYSELF OCCUPIED." SLEEP OR REST MORE -- LAY DOWN AND RELAX. TAKE 10-15 MINUTES DEEP SLEEP NAP. IF INDICATION OF CHEST PAIN, THEN RELAX, DRINK AN GLASS OF WATER OR TAKE NAP. IF DOESN'T LEAVE IN 4-5 MINUTES, TAKE NITRO. TRY TO GET OUT OF HOUSE AT LEAST ONCE PER DAY

072FD MAIN ADJUSTMENT IS TO SLOW DOWN, BUT NEVER HAD TO STOP MOST ACTIVITIES

107JB STILL MANAGE TO CARRY OUT ACTIVITIES -- ALWAYS DID -- IT SIMPLY TOOK LONGER DUE TO REST BREAKS. COULD ALWAYS CARRY OUT ALL BUSINESS (OFFICE, MAINTENANCE) WORK

030RH "WHEN I FEEL IT COMING ON I JUST SLOW DOWN -- I SOMETIMES STOP BUT ALWAYS RESUME AND FINISH THE ACTIVITY."

087SW "I TAKE OFF TIME FROM WORK FOR NAP AND EXERCISE EACH DAY. OTHER=WALK MORE SLOWLY AND DO LESS FAST DANCES (NO DISCO)." INTERVIEWER NOTE: SUBJECT RUNS BUSINESS FROM OWN HOME

083JS OTHER=RUN AIR CONDITIONER, NOT NEARLY AS ACTIVE. "DON'T GO OUTSIDE, DON'T DRIVE FAR.

008JB AVOID NIGHT AIR & FIRST THING IN MORNING. WARM UP CAR, THEN COME IN, STAND UP.

022CE "START & GOTTA STOP. 1/4 THROUGH CAR WASH OR YARD WORK. BUT DO FINISH. JUST SLOWER. MUST PACE AND REST."

QUESTION 20A

020WR YARDWORK -- CANNOT DO HEAVY CUTTING OR LAWN ANY LONGER. "BACK PROBLEM TOO, BUT NEVER PREVENTED ME FROM DOING YARDWORK. WOULD PREFER TO DO MYSELF."

082JM ANSWERED NO TO #20. "I DO HAVE MEN WORKING FOR ME ON CONSTRUCTION LABOR THAT I MIGHT DO MYSELF IF I DID NOT HAVE ANGINA -- BUT I HAVE HAD THEM WORKING FOR ME FOR A NUMBER OF YEARS. I'VE ADJUSTED. I DO NOT WANT TO DO PHYSICAL LABOR."

043VL ANSWERED NO TO #20. LIVES IN AN APARTMENT -- ALL MAINTENANCE TAKEN CARE OF

024AF WIFE HAD STROKE AND CANNOT DO ANY WORK. NOW DO MOST EVERYTHING IF AT GETS DONE AT ALL

084ES HEAVY HOUSEWORK AND HARD VACUUMING. " DAUGHTER COMES IN AND DOES HEAVY CLEANING ONCE A MONTH. NO MONEY CHANGES HANDS. TRY TO DO NICE THINGS FOR HER. DAUGHTER CLEANS 12/YEAR. NO COST BECAUSE ITS MY DAUGHTER." ESTIMATES 52 ADDITIONAL ANGINA EPISODES PER YEAR. "I WOULD CLEAN EVERY WEEK IF I DIDN'T GET CHEST PAINS, BUT VACUUMING REALLY IS TREACHEROUS. BECAUSE MY DAUGHTER DOES IT AND WON'T TAKE MONEY. ONLY HAVE HEAVY CLEANING DONE ONCE PER MONTH." ANGINA WOULD BE MORE SEVERE AND WOULD ADD A LARGE AMOUNT OF HEART ATTACK RISK. THERE IS NO OTHER REASON FOR DAUGHTER TO DO THIS WORK. SUBJECT ALSO USES CARWASH 24 TIMES PER YEAR. PURCHASED NO EQUIPMENT NOR MADE ANY STRUCTURAL CHANGES TO HOME

012JB HIRE OUT HEAVY LABOR ON JOBS

02JWF ANSWERED NO TO #20. SON DOES LAWN. AUTO WORK. HOUSE PAINTING; HE IS A CARPENTERS' SUPERVISOR. "FOUR-FIVE HOURS TO MOW AND CUT LAWN -- HALF THE TIME I REST."

033RH ANSWER NO TO #20. "I LIVE IN LEISURE WORLD -- IT'S TAKEN CARE OF."

107JB ANSWER NO TO #20 -- NO NEVER HIRED OUT JOBS. STILL CONTINUED TO DO HIMSELF DESPITE ANGINA INCONVENIENCE

031EH ANSWERED NO TO #20 -- DAUGHTER DOES ALL WORK

037CK ANSWERED NO TO #20 -- DOES NOT HIRE HELP. JUST TAKES HIS TIME TO DO JOBS AROUND HOUSE. MIGHT MOW FRONT YARD ON ONE DAY AND THE BACK THE NEXT OR A FEW DAYS LATER. "NO HURRY, IF IT GETS DONE, IT GETS DONE."

017LC ANSWERED NO TO #20 -- WIFE DOES A LOT OF WORK AROUND THE HOUSE. VERY SMALL YARD. HE WILL USE AN ELECTRIC POWER LAWN MOWER "ON A GOOD DAY" BUT NOT OFTEN. WIFE USUALLY MOWS THE LAWN. SHE WILL EMPTY THE GRASS CATCHER FOR HIM. HE WILL MOW THE LAWN A LITTLE AT A TIME OVER 2-3 DAYS. "BECAUSE OF MY INTEROCULAR IMPLANTS I HAVE BEEN INSTRUCTED TO NEVER LOWER MY HEAD BELOW THE LEVEL OF MY HEART. I MUST FOLD UP LIKE AN ACCORDIAN TO PICK SOMETHING UP THAT I HAVE DROPPED."

094F6 HIRES OUT WORK SUCH AS PAINTING, AUTO MAINTENANCE AND HOME REPAIRS KIDS DO HEAVY YARDWORK. SUBJECT GAVE EXAMPLE OF HIRING HELP TO DO CARPET LAYING AND PAINTING OF A BEDROOM. WOULD PREFER AND NORMALLY WOULD DO HIMSELF. "I DO A BETTER JOB -- I LIKE MY JOB BETTER."

103RM SUBJECT COMPLETED QUESTIONNAIRE AND RETURNED BY MAIL. WHEN LATER CALLED ON PHONE WAS RELUCTANT TO ITEMIZE EXPENSES FOR INDIVIDUAL SERVICES HIRED. INTERVIEWER'S JUDGEMENT WAS TO USE THE EXTENSIVE HOME MAINTENANCE COSTS (\$2000) AS THE EXAMPLE FOR #20A.

067SW ANSWERED NO TO #20 -- HAS NOT HIRED ANY SERVICES TO PREVENT ANGINA. STILL WORKS IN YARD; DOES HAVE A GARDENER AT \$60/MONTH

046EM ANSWERED NO TO #20 -- HAS THREE SONS. OLDEST IS AUTO MECHANIC AND HE DOES THE CAR WORK. TWO YOUNGER MAINTAIN THE YARD, PLUMBING, ETC

002WH ANSWERED NO TO #20 -- HAVE FOUR BOYS AND THEY DO ALL

088EP ANSWERED NO TO #20 -- SON IS LIVING BACK AT HOME. SON
DOES ALL THE HEAVY WORK
062JT ANSWERED NO TO #20 -- STAMINA AS A YOUNGER GUY, NOW LIVE
IN TOWNHOUSE APARTMENT. EVERYTHING IS GOING ALONG FINE
NOW.

QUESTION 20B

016LD MAJOR JOBS. "MY SONS TAKE CARE OF SMALL JOBS, OIL
CHANGE, TUNE-UPS, ETC."
006WB "DO IT MYSELF NOW. ONLY HIRED ONCE WHEN I WAS TOO ILL
TO DO IT BECAUSE OF ANGINA PROBLEMS."

QUESTION 20D

024AF "I WOULDN'T MAKE IT THROUGH IT."
005CB WOULD HAVE ADDITIONAL ANGINA BUT CANNOT SAY HOW MANY
EPISODES--WOULD HAVE A HEART ATTACK
108JA WOULD HAVE ADDITIONAL ANGINA BUT CANNOT SAY HOW MANY
EPISODES
016LD WOULD HAVE ADDITIONAL ANGINA BUT CANNOT SAY HOW MANY
EPISODES. "JUST CAN'T DO EVEN ONCE. NO WAY TO DO THE
WHOLE YEAR BECAUSE OF ANGINA."
052HR "ONE TIME WAS PLANTING A TREE USING A POSTHOLE DIGGER
AND ENDED UP IN THE HOSPITAL."
006WB ANSWERED NO. "ONLY HIRED ONCE WHEN TOO ILL TO DO IT
BECAUSE OF ANGINA PROBLEMS, DO IT MYSELF NOW."
051JR 24 ADDITIONAL EPISODES FOR ALL KINDS OF WORK SUBJECT
HIRES OUT
094PG 60 ADDITIONAL EPISODES FOR ALL KINDS OF WORK SUBJECT
HIRES OUT
083JS ANSWERED YES. PROBABLY WOULD NOT BE AROUND.

QUESTION 20E

100WC CANNOT USE ARMS FOR ANY LIFTING AT ALL -- SEVERE PAIN
BROUGHT ON BY ANY LIFTING WORK
052HR THIS QUESTION IS POORLY WORDED
006WB SUBJECT DID NOT KNOW -- ONLY HIRED ONCE. DID NOT WANT
TO RISK ANGINA AT THAT TIME. HAD TROUBLE AND WAS JUST
TOO ILL TO DO IT. BUT DOES YARDWORK ALL THE TIME NOW.
FELT HE WOULD HAVE AN ANGINA ATTACK IF HE HAD DONE THE
YARD THAT DAY. ANY ANGINA WOULD BE UNCOMFORTABLE
083JS "I AVOID ALL SORTS OF ACTIVITIES SO I DON'T GO TO THE
HOSPITAL. I DON'T WANT TO SEE IT AGAIN."

QUESTION 20F

080WR WOULD ADD A SMALL AMOUNT OF RISK -- ALSO COMMENTED THAT IN THE LONG RUN WORKING IN THE YARD WOULD HELP HIS HEART -- "I DON'T THINK ANGINA WOULD ADD MUCH."
 100WC WOULD ADD A LARGE AMOUNT -- 40%
 006WB SUBJECT DID NOT KNOW. "UNKNOWN, BECAUSE I NOW DO THIS WORK. IT WAS ONLY ONCE THAT I HIRED IT."
 051JR ANSWERED ADD A LARGE AMOUNT. "DR. ALREADY SAID 25% CHANCE IF I DO NOTHING."
 083JS ANSWERED 100%--"IN A HURRY."

QUESTION 20G

012JB "PARTIALLY 'CAUSE I'M LAZY."
 006WB "THAT WAS THE ONLY REASON I HIRED IT DONE BECAUSE I WAS TOO ILL FROM HEART PROBLEMS TO DO IT THEN. BUT I DO IT ALL THE TIME NOW."
 086GS ANSWERED YES -- IN ORDER FOR HIM TO BE TRANSPORTED HE MUST HAVE A WORKING CAR -- WANTS TO KEEP CAR RUNNING WELL
 100WC ANSWERED NO -- WOULD PREFER TO DO HIMSELF
 094PG ANSWERED NO -- WOULD PREFER TO DO HIMSELF

QUESTION 20H

080WR SUBJECT HAS HEAVY DUTY CLEANING DONE AROUND THE HOUSE EVERY 6 WEEKS AT \$75 PER VISIT. SUBJECT USED TO DO VACUUMING FOR WIFE BUT CANNOT DO IT ANYMORE. ONCE PER YEAR HIRES OUT HEAVY YARDWORK WHICH INVOLVES TRANSPLANTING AT \$75 ABOVE NORMAL YARDCARE SERVICE CHARGES
 024AF HOUSE PAINTING, WINDOW WASHING, RUG CLEANING, AND AUTO REPAIR
 100WC "SNAPPED A PIPE -- TRIED (TO FIX) MYSELF BUT COULDN'T TWIST -- HAD TO CALL A PLUMBER TO TURN ONE PIPE. HE RIPPED ME OFF." PLUMBER COST=\$120, ONE VISIT
 052HR AUTO REPAIR ONCE DURING THE YEAR AT \$50. "TORE DOWN CAR COULDN'T GET IT BACK TOGETHER (BECAUSE OF ANGINA) -- HAD TO HIRE HELP."
 018LD SUBJECT LISTED YARD WORK AND PLUMBING. BECAUSE SUBJECT WAS NOT ABLE TO CARE FOR HIS LAWN, HE HAD IT CONVERTED TO A ROCK GARDEN. HE HIRES HIS GRANDKIDS TO PULL THE WEEDS A COUPLE TIMES EACH YEAR AND PAYS THEM A TOKEN AMOUNT
 039HK TV REPAIRS, CLEANING OF CARPETS, CLEANING OF DRAPES
 109NM AUTO MAINTENANCE
 051JR SUBJECT LISTED "EATING OUT 150 TIMES IN PAST YEAR" BECAUSE HE CANNOT STAND AND WALK DISTANCE IN GROCERY STORES NOR CARRY BAGS INTO THE HOUSE. ALSO LISTED HOUSEWORK, YARDWORK, AND HOUSE MAINTENANCE (PLUMBING, ELECTRICAL, ETC.)

0266S HIRED COOK 30 TIMES IN PAST YEAR. SUBJECT CANNOT STAND LONG
094PG YARDCARE, AUTO MAINTENANCE, PAINTING, PLUMBING, AND HOUSE MAINTENANCE
103RM GARDENING, AUTO MAINTENANCE, AND HOME MAINTENANCE

QUESTION 201

080WF ANSWERED NO -- BOUGHT GARAGE DOOR OPENER MORE FOR CONVENIENCE, NOT BECAUSE OF HEART. NO OTHER EXPENDITURE
024AF INSTALLED RAILING AROUND PATIO -- LIVE IN MOBILE HOME WITH AN ELEVATED PATIO
0050B ANSWERED NO BUT SUBJECT NOTED THAT HIS CHILDREN GAVE HIM A TV REMOTE CONTROL FOR FATHER'S DAY SO HE WOULD NOT HAVE TO GET UP TO CROSS ROOM
052HA ANSWERED NO FOR THE PAST YEAR -- ALREADY HAS MADE EXPENDITURES -- WITHOUT POWER EQUIPMENT COULD NOT DO WORK
039HK SUBJECT LISTED RECLINER CHAIR, HEATING PAD FOR CHEST, MATTRESS, AND OXYGEN EQUIPMENT AND CYLINDER REFILL EXPENSE
094PG SUBJECT LISTED A NEW AUTOMOBILE AT \$10,000. SUBJECT WOULD PREFER A USED CAR BECAUSE HE LIKES TO WORK ON CARS AND FIX THEM UP. BUT REALIZED "I NEEDED A DEPENDABLE CAR AND CAN NO LONGER DO THE WORK ON OLDER CARS THAT NEED MORE MAINTENANCE."
103RM ELECTRIC GARAGE DOOR OPENER AND A CART TO CARRY OUT TRASH CANS TO CURB

QUESTION ALT-20

082JM ANSWERED NO -- NOT IN PAST 12 MONTHS BUT PREVIOUS
057RS ANSWERED NO AND THEN NOTED THAT WHEN HE RETURNED TO WORK FOR TWO MONTHS (JANUARY TO MARCH 1986) HE HAD TO HIRE A "HONCHO" TO DO THE FLOOR COVERING WORK THAT HE USED TO DO HIMSELF BEFORE HE HAD THE HEART TROUBLE. SUBJECT IS SELF-EMPLOYED IN THE FLOOR COVERING BUSINESS. AFTER TWO MONTHS HE QUIT DUE TO JOB STRESS -- "TOOK ME 6 WEEKS BEFORE I FELT RIGHT AGAIN."
037CK ANSWERED NO -- POWER LAWN EQUIPMENT OLDER THAN 12 MONTHS
046EM ANSWERED NO -- BUT NOTED THAT CHILDREN BOUGHT HIM AN ALUMINIUM GARAGE DOOR FOR FATHER'S DAY
062JT ANSWERED NO -- SOLD HOUSE & PUT MONEY INTO BUSINESS. DID NOT HAVE TO WORRY ABOUT YARD OR HOME MAINTENANCE IN APARTMENT.

QUESTION ALT-20A

017LC LAWN MOWER AT \$140 WAS USED BY SUBJECT TO ANSWER ALT-20A
TO E. SUBJECT ALSO NOTED PURCHASE OF RECLINER CHAIR AT
\$350 TO ENABLE HIM TO SLEEP IN A MORE UPRIGHT POSTURE
AND AVOID ANGINA AT NIGHT. ESTIMATED THAT RECLINER
PREVENTED AN ADDITIONAL 335 EPISODES OF ANGINA (AT LEAST
ONE PER NIGHT). SUBJECT ALSO NOTED THE PURCHASE OF
WASHER AND DRYER AT \$350 A PIECE. FORMERLY SUBJECT HAD
TO TAKE CLOTHES TO LAUNDROMAT ONCE PER WEEK; TRIP OUT
ALSO ASSOCIATED WITH ANGINA. WASHER AND DRYER, AND
RECLINER ENTERED INTO ALT-20B
032WH MATTRESS WAS PURCHASED TO SLEEP BETTER AND GET MORE REST
-- "ANGINA AT NIGHT IS LESS."

QUESTION ALT-20F

017LC ANSWERED NO BUT NOTED THAT PURCHASES DO ALSO MAKE THINGS
EASIER FOR HIS WIFE

QUESTION ALT-20G

017LC WASHER AND DRYER AT \$700; RECLINER CHAIR AT \$350 ...
032WH NEW AUTOMOBILE AT \$11,000. "WIFE DOES MOST OF THE
DRIVING BECAUSE DON'T DO MYSELF MUCH. CAN'T REPAIR OR
ALLOW HER TO GET STUCK."

QUESTION 21

091IM ANSWERED NO -- RETIRED 2 YEARS AGO
030RH ANSWERED NO -- WORKS AS A VOLUNTEER AT THE LONG BEACH
VETERANS ADMINISTRATION MEDICAL CENTER ON 1 DAY EACH
WEEK
034EB ANSWERED NO -- WORKS OCCASIONALLY AT ANAHEIM STADIUM
PARKING LOT AS AN ATTENDANT WHEN SOME OF THE REGULARS
CANNOT -- IS NOT EVEN REGULAR PARTTIME WORK
033RH SUBJECT IS 33 YEARS OLD -- RETIRED FOR 17 YEARS
001HA SUBJECT IS RETIRED FOR 16 YEARS -- WAS A CAB DRIVER
062JT 10-12 HOURS, SIX DAYS PER WEEK

QUESTION 21B

082JM CONSTRUCTION WORK
 025CF LIGHT ELECTRICAL OR PLUMBING
 012JB WORKING CONTRACTOR -- CARPENTRY, LIGHT CONSTRUCTION
 006WB ELECTRICAL TEST TECHNICIAN AT SAN ONOFRE NUCLEAR
 GENERATING STATION
 072PD WORKS 30 HOURS PER WEEK AT HUGHES SATELLITE AS AN
 ELECTRICAL ENGINEER. WORKS ON OWN CONSULTING BUSINESS ON
 THE SIDE
 107JB MANAGER OF MINI-STORAGE WAREHOUSE; 60% OFFICE WORK AND
 40% MAINTENANCE
 016GC FREELANCES AT OFFICE WORK; WORKS FROM 1-20 HOURS PER
 WEEK. IS ON FULL DISABILITY
 086GB REAL ESTATE SALES
 064DT HOUSECLEANING
 094PG MANUFACTURING ENGINEER
 103RM REAL ESTATE BROKER
 067SW BROKER -- MARKETS OWN PRODUCT (GIFT BOXES) FROM HOME TO
 VARIOUS RETAIL CHAINS
 007FB CARPENTER FOR ROCKWELL

QUESTION 21C

107JB 8 DAYS DUE TO CABG -- STARTED BACK TO WORK IMMEDIATELY
 UPON RELEASE FROM THE HOSPITAL -- GRADUALLY WORKED BACK
 INTO THINGS, ANSWERED PHONES, MESSAGES

QUESTION 21E

006WB ANSWERED NO -- REALLY WANTED TO CHANGE POSITIONS BUT
 WASN'T ALLOWED. AFTER ELECTROCUTION INJURY, WAS OFF
 WORK 18 MONTHS BUT WENT BACK TO SAME POSITION
 094PG ANSWERED YES -- FORMERLY A DESIGN ENGINEER -- WORKED
 MORE HOURS AND MADE MORE MONEY PER HOUR

QUESTION 21F

094PG "I PREFER TO WORK MORE HOURS THAN THE NORMAL PERSON DOES
 -- IT'S MORE SATISFYING."

QUESTION 216

094PG "MADE TWICE THAT (\$20-24.9K) AT MY OTHER JOB."
008WB REFUSED AND COMPLAINED. DOESN'T THINK IT IS ANYONE'S
BUSINESS, ESPECIALLY A GOVERNMENT AGENCY'S LIKE EPA.
"IF I TOLD YOU MY SALARY THE GOVERNMENT MIGHT THINK THAT
OUT OF THAT AMOUNT I SHOULD BE ABLE TO SPEND A CERTAIN
AMOUNT FOR HEALTH CARE AND THAT'S NOT TRUE. EVEN IF
SOME PEOPLE MAKE MORE MONEY IT DOESN'T MEAN THEY HAVE
MORE TO SPEND JUST BECAUSE THE GOVERNMENT THINKS THEY
DO. NO ONE SHOULD TELL ME WHAT THEY THINK I CAN AFFORD
TO SPEND ON ANY PART OF MY LIFE."

QUESTION ALT-21

043VL ANSWERED YES -- "EARLY RETIREMENT TO GET AWAY FROM
HAVING A HEART ATTACK."
024AF ANSWERED NO -- QUIT 1960 -- MADE VALVES FOR MUSICAL
INSTRUMENTS
015RC ANSWERED NO -- QUIT 1965 -- RETIRED AFTER 21 1/2 YEARS
IN THE NAVY AT AGE 38 -- WORKED 7 YEARS AFTER THAT THEN
QUIT
084EB ANSWERED NO -- WENT ON 100% DISABILITY 7 YEARS AGO WITH
HEART PROBLEMS
005CB ANSWERED YES -- QUIT 3 YEARS AGO -- DROVE FORKLIFT WITH
GASOLINE ENGINE; FUMES MADE THE SUBJECT DIZZY AND GAVE
HIM PROBLEMS
108JA ANSWERED YES -- HEART ATTACK IN 1983
018LD ANSWERED YES -- IN 1981, SET-UP OWN SHEET METAL SHOP
BUSINESS, HAD TO QUIT. HIS SONS TRIED TO MAKE IT GO --
LOST BUSINESS
052HR ANSWERED YES BUT CODED NO -- QUIT WORKING 7 YEARS AGO.
WAS EMPLOYED IN ELECTRICAL POWER CONSTRUCTION WITH LOS
ANGELES DEPARTMENT OF WATER AND POWER. SALARY WAS \$20-
24.9K. PHYSICIANS WILL NOT LET HIM GO BACK TO WORK
003WF ANSWERED NO -- QUIT WORKING IN 1978. WAS EMPLOYED AS A
COMMERCIAL TRUCK DRIVER AND CHARTER/SCHOOL BUS DRIVER.
SUBJECT WAS A LINE DRIVER ON CROSS-COUNTRY RUNS. WOULD
DRIVE FOR 6-8 HOUR STRETCHES. BY QUITTING, SUBJECT LOST
TEAMSTERS PENSION AND SCHOOL DISTRICT RETIREMENT
OPPORTUNITIES. SALARY WAS \$25-25.9K. DOES NOT FEEL
CONDITION HAS IMPROVED ENOUGH TO RETURN TO WORK
009HK ANSWERED NO -- QUIT 14 YEARS AGO. WAS EMPLOYED AS A
CORPORATE PILOT (PIPER AZTEC AND LEAR JET). SALARY WAS
\$260K
019NM ANSWERED NO -- CLOSED COMPANY IN 1978 IMMEDIATELY AFTER
HAVING HEART PROBLEMS
037CK ANSWERED YES BUT CODED NO -- QUIT IN 1972 OR 1973. WAS
EMPLOYED AS A UNION CARPENTER. DECLINED TO STATE
SALARY. DOES NOT BELIEVE CONDITION HAS IMPROVED ENOUGH
THAT HE COULD RETURN TO WORK

017LC ANSWERED NO -- QUIT WORK AS AIRCRAFT INDUSTRY INSPECTOR
IN JANUARY 1977 AND HAD CABG SURGERY ON MAY 4, 1977
046EM ANSWERED NO -- RETIRED 1976
032WH ANSWERED NO -- QUIT IN 1978, BLACKED OUT AND FELL OFF
HORIZONTAL BORING MILL MACHINE. HURT BACK IN FALL
083JS "HAD TO QUIT. TOO YOUNG FOR SOCIAL SECURITY, NO
RETIREMENT, SO WAS REALLY HARD OFF FOR 1-1/2 YRS UNTIL
ABLE TO GET SOCIAL SECURITY"

QUESTION ALT-21B

057RS SELF EMPLOYED IN FLOOR-COVERING BUSINESS
043VL FACILITIES MANAGER FOR SEVERAL SAVINGS AND LOAN
BUILDINGS
100WC CONSTRUCTION -- SALES, BUT DID DO HEAVY LABOR
021RE TEACHER
005CB FORKLIFT OPERATOR
108JA SALESMAN
018LD SHEET METAL CRAFTSMAN -- SELF EMPLOYED
091IM REAL ESTATE APPRAISER
089KC ELECTRICAL ENGINEER -- SELF EMPLOYED, CONSULTANT
079LB MANAGEMENT -- HOME IMPROVEMENT
003GB ADMINISTRATOR -- GROUP HEALTH CARE PROGRAM FOR A MAJOR
CORPORATION
106BD COMPUTER PROGRAMMER/OPERATOR

QUESTION 21D

057RS ANSWERED NO -- WITH PHYSICIAN'S APPROVAL, RETURNED TO
WORK (OWN-FLOOR COVERING BUSINESS) IN JANUARY 1986.
AFTER TWO MONTHS OF WORK STOPPED AGAIN. "SIX WEEKS
BEFORE I FELT GOOD AGAIN -- PROBABLY COULD WORK BUT IT'S
JUST NOT WORTH IT."
091IM ANSWERED YES -- ON A PARTTIME BASIS
089KC ANSWERED NO -- IT'S (PHYSICIANS) BEING DEBATED IF HE
SHOULD RETURN TO WORK
079LB ANSWERED NO -- IMPROVED, BUT NOT THAT MUCH -- NOT SURE
106BD ANSWERED NO -- IS LOOKING FOR A JOB. WAS LAID OFF AFTER
HEART AND HIGH BLOOD PRESSURE PROBLEM. DOES HAVE SOME
ANXIETY ABOUT RETURNING TO WORK

QUESTION 23

025JF PUTTING IN CEILING FAN IN ATTIC AT HOME
057RS DRIVING HOME FROM ANAHEIM STADIUM IN PERSONAL CAR
043VL SOCIAL DANCING AT A LONG BEACH DANCE CLUB
082JM MOVING CARS INTO GARAGE AND PARKING ON DRIVEWAY
080WR INDOORS AT HOME, SITTING, THINKING ABOUT BUSINESS PROBLEMS
024AF AFTER DINNER AT RESTAURANT, TALKING
015RC GETTING READY TO TAKE DAUGHTER TO THE PROM - OPENING CAR DOOR
084EB SITTING AT HOME THINKING; TROUBLED ABOUT RUNNING OUT OF MEDICATIONS
009DB NOCTURNAL ANGINA JUST BEFORE USUAL WAKING TIME FROM NIGHT SLEEP
100WC IN LIVING AREA AT HOME; PLAYING WITH DOG
012JB AT WORK AT SOMEONE ELSE'S HOME; MOVING FURNITURE
021RE AT LOCAL LAKEBIDE RECREATION AREA; WALKING BRISKLY WITH FRIEND
005CB AT HOME, WALKING UP STAIRS
108JA IN BED, GETTING UP THAT MORNING
018LD AT HOSPITAL AFTER UPPER GI; TALKING TO WIFE.
052HR ON FREEWAY DRIVING IN FROM RIVERSIDE IN PERSONAL CAR
091IM AT HOME DOING THINGS AROUND THE HOUSE IN THE MORNING
006WB OUTDOORS AT WORKSITE, WALKING UP MANY FLIGHTS OF STAIRS TO WHERE CAR WAS PARKED
023WF IN BATHROOM SHOWERING; RINSED OFF, SAT ON STOOL UNTIL ANGINA PASSED
089KC IN LIVING ROOM, GETTING OUT OF CHAIR TO WALK ACROSS THE ROOM
072FD OUTDOORS, GOING TO LUNCH WITH ASSOCIATES, WALKING UPHILL
033RH "OCCURRED ABOUT 1 MONTH AGO, CANNOT REMEMBER WHAT I WAS DOING OR WHERE I WAS AT. DON'T USUALLY HAVE TO STOP THE ACTIVITY AND RARELY TAKE A NITRO." (RESPONDANT IS 83 YEARS OLD.)
107JB DOING DRYWALL REPAIR AT WORKSITE (HOME BUSINESS)
031EH INDOORS AT HOME, WATCHING TV
075TS IN HOME GARAGE, TAKING ENGINE OUT OF CAR
079LB IN SHOWER, SHAMPOOING HAIR
016GC IN BED, SEXUAL ACTIVITY
039HK OUTSIDE APARTMENT, CARRYING GROCERIES UPSTAIRS (1 FLIGHT OF STAIRS)
003GB MORNING WALK FOR EXERCISE ON NEIGHBORHOOD STREETS
109MM IN BED, SEXUAL ACTIVITY
050EF INDOORS, WORKING AROUND THE HOUSE; PICKED UP SOMETHING HEAVY
051JR WALKING ON THE STREET (MAIN THOROUGHFARE)
086GS STARTING NIGHT SLEEP, IN BED AT HOME
064DT INDOORS AND OUTDOORS AROUND THE HOUSE; VACUUMING, SWEEPING AND PICKING UP
037CK OUTDOORS IN YARD, MOWING LAWN WITH SELF PROPELLED GAS LAWN MOWER

017LC MORNING WALK FOR EXERCISE ON NEIGHBORHOOD STREETS; COLD WIND BLOWING
 106RD JUST RETURNED FROM TAKING ROOMMATE TO WORK; IN KITCHEN, DOING DISHES AND CLEANING UP
 001HA OUTDOORS IN YARD, DOING MOWING AND SPADING WORK
 030RH DOING VOLUNTEER WORK, WALKING INDOORS AT THE VA HOSPITAL
 103RM OUTDOORS AT HOME, PUSHING TRASH CANS ON CART TO THE CURB
 067SW AT WEDDING RECEPTION, DOING A FAST DANCE
 046EM AT HOME, WATCHING TV AND RELAXING IN RECLINER
 032WH OUTDOORS IN YARD, MOWING LAWN WITH GAS POWER MOWER
 007FB AT WORKSITE, INDOORS, DOING LIFTING AND CARRYING WORK
 088EF OUTDOORS IN YARD, DOING GARDENING AND MOWING LAWN
 094FG OUTDOORS IN YARD, WALKING AROUND
 083JS MOWING FRONT LAWN AT HOME
 0080P WALKING UP DRIVEWAY AT HOME, COLD, DAMP
 0623T AT WORK. INDOORS SHOP AREA.
 022CE INDOORS, LIVINGROOM, WATCHING TV

QUESTION 27

057RS OTHER="RESTED WHEN I GOT HOME -- WATCHED TV."
 080WR OTHER="I THINK ABOUT SOMETHING ELSE -- GET MY MIND OFF OF THINGS. TRY NOT TO TAKE NITRO -- GIVES ME HEADACHES."
 084EB TOOK NITROGLYCERINE AND TRANQUILIZER
 009DB OTHER=GET UP FROM BED, SLOWLY MOVE AROUND, TAKE DEEP BREATHS AND WALK A LITTLE
 021RE TAKE ISOSORBIDE
 006WB PAIN STARTED AFTER COMPLETING CLIMB OF STAIRS (ESTIMATED 300-400 STEPS); STOPPED AND LEANED AGAINST POST THEN WALKED TO CAR
 089KC OTHER=LEFT FOR HOSPITAL WHERE THEY HELPED HIM "HANDLE" THE STRESS
 033RH INTERVIEWER PROBE: SO A TYPICAL EPISODE FOR YOU IS MILD, AND YOU CAN SIMPLY SLOW DOWN AND THE CHEST PAIN WILL GO AWAY? "YES."
 086GB OTHER=CHANGED SLEEPING POSITION OF BODY
 017LC OTHER=TURNED AROUND AND PUT BACK TO COLD WIND WHILE RESTING
 106BD BOTH 1 AND 3 WERE IMPORTANT MEANS OF RELIEF -- COULDN'T SAY WHICH IS MOST IMPORTANT
 001HA "THIS WAS BEFORE I TOOK NITRO. SLOWED DOWN -- PAIN WENT AWAY."
 007FB "I JUST SLAPPED ON A NITRO PATCH -- PAIN WENT AWAY. THOSE THINGS (NITRO PATCHES) GENERALLY WORK FOR 24 HOURS."
 088EF BOTH 1 AND 3 WERE IMPORTANT MEANS OF RELIEF -- COULDN'T SAY WHICH IS MORE IMPORTANT.

083JS WAITED 5 OR 6 HRS. UNTIL COOL OF EVENING TO FINISH
 008JB COME INSIDE HOUSE, TAKE NITRO, WARM UP OVER FLOOR
 FURNACE
 062JT WOULD TAKE NITRO ONLY IF MORE TENSE OR PRESSED FOR TIME
 022CE OTHER=MAALOX, "EASED ME DOWN A BIT." SHUT PROGRAM OFF.
 WENT OUTSIDE RELAXING, THINKING ABOUT OTHER THINGS.
 READ PAPER. FELT BETTER.

QUESTION 28

082JM OTHER="NO PARTICULAR EFFECT. I'VE ADJUSTED TO IT; IT
 DOESN'T BOTHER ME."
 084EB "IF I DIDN'T HAVE VA WOULD WORRY ABOUT MEDICAL TREATMENT
 EXPENSES." "WOULD PREFER TO BE ACTIVE."
 021RE OTHER="I WISHED I COULD GET INTO EXPERIMENTAL PROGRAM
 (LASER REMOVAL OF CORONARY ARTERY OCCLUSIONS) AT UCI."
 018LD "AT THE EXACT MOMENT OF THE ATTACK I THINK OF #4, BUT
 AFTER YOU GET TO FEEL BETTER THEN NUMBER 6."
 091IM "WAS WORRIED COULD NOT FINISH JOB (APPRAISAL)."
 023WF OTHER="NO WORRY -- MIND GOES BLANK -- LET THE WORLD GO
 BY -- THINK ABOUT NOTHING -- BLOCK IT -- WORK AROUND
 IT."
 033RH "ANYBODY WOULD WORRY ABOUT A HEART ATTACK."
 075TS LOST INCOME -- STOPPED DOING FREELANCE AUTO REPAIR
 109MM OTHER="DISEASE -- JUST HAVING DISEASE."
 051JR OTHER="IMMINENT DEATH."
 017LC OTHER="NOTHING REALLY HERE THAT IS PARTICULARLY
 BOTHERSOME -- I GET MY SOCIAL SECURITY CHECK EACH MONTH
 --ALREADY HAVE GONE THROUGH BYPASS. JUST A DAILY WAY OF
 LIFE."
 001HA "ALWAYS MILD PAIN WHEN I HAD IT."
 007FB ANSWERED NO TO HEART ATTACK OR CABG -- "ALREADY BEEN
 THROUGH ALL OF THAT." BOTH 6 AND 8 WERE BOTH EQUALLY
 BOTHERSOME, "NO DIFFERENCE."
 083JS OTHER="PERSONAL DISAPPOINTMENT BECAUSE OF DOUBTS THAT
 YOU CAN'T DO WHAT YOU SET OUT TO DO." "ALWAYS CONCERNED
 ABOUT LOST INCOME BECAUSE YOU DON'T LIVE ON SOCIAL
 SECURITY, YOU EXIST. NO POSSIBLE WAY TO LIVE ON S.S."
 062JT OTHER=DEATH, POTENTIAL EXPENSES FOR NON-MEDICAL COSTS
 022CE HAD VA & WAS RETIRED, NO CONCERN FOR FIRST TWO, NO
 CONCERN ABOUT MI, "I ACCEPTED IT NOW, DOESN'T BOTHER
 ME" CONCERN TO FAMILY "VERY MUCH SO. I SEE IT IN MY
 FAMILYS' FACES."

QUESTION 29

012JB \$0.12 -- THE COST OF 1 NITRO TABLET. CODED AS \$0
 018LD COST OF NITRO -- 1 TABLET. CODED AS \$0
 005CB \$56 -- ANSWERED \$8 X 7 = \$56, WORKING
 091IM \$0.00 -- "DELAYED. HAD TO GO BACK NEXT DAY (TO FINISH APPRAISAL)."
 089KC \$100,000 - INTERVIEWER EXPLAINED THAT WE WERE SEEKING AN ANSWER FOR THIS PARTICULAR ANGINA EPISODE, SUBJECT STILL RESPONDED WITH \$100,000 ANSWER. INTERVIEWER COMPLETED THE REMAINING QUESTIONS AND RETURNED TO THIS QUESTION. THE RESPONDANT GAVE THE SAME ANSWERS. THE SUBJECT ALSO GAVE ANSWERS IN THE SAME MONETARY RANGE FOR #30A AND B.

062JT ANSWERED \$0. "NOT ON A PER EPISODE BASIS, BUT THE WHOLE SITUATION ENDED UP IN A FINANCIAL LOSS. MORE ON A BIGGER SCALE. YOU START ADJUSTING YOURSELF--YOU START BEING LESS PRODUCTIVE. YOU'RE MENTALLY IN ANOTHER GEAR ABOUT EVERYTHING YOU DO."

022CE ANSWERED \$0. "NOT THIS EPISODE BUT DOES IMPACT OTHER WORK THAT I DO--\$100/MO. I DO ELECTRICAL WORK FOR NEIGHBORS (NEW OUTLETS, REPLACE BURNED OUT BREAKER) HELPS ME WITH MY WIFE AND MAKES ME FEEL BETTER ABOUT CONTRIBUTING TO THE HOUSE."

QUESTION 30A & 30B

043VL ANSWERED \$0 AND #3 -- "WORTH VERY LITTLE TO ME -- JUST TAKE A NITRO."

082JM ANSWERED \$0 AND #3 -- "JUST A MATTER OF ADJUSTMENT. I'D JUST SLOW DOWN AND REST."

024AF INTERVIEWER FORGOT TO ASK QUESTION 30.

015RC ANSWERED \$INFINITE -- "YES, WOULD SELL HOUSE - CAR, WHATEVER I HAVE."

084EB ANSWERED \$0 AND #4 -- "I'VE LEARNED HOW TO GET RID OF MY ANGINA AT NO COST - I STOP DOING THE ACTIVITY AND IT DOESN'T MAKE SENSE (TO PAY MONEY) UNLESS IT (THE CURE) IS PERMANENT."

021RE ANSWERED \$0 AND #3 -- "ONLY IF I KNEW IT WERE GOING TO BE EXTREMELY SEVERE WOULD I BE WILLING TO PAY TO AVOID IT."

108JA ANSWERED #4 OTHER -- "WOULD BE WILLING TO PAY SOMETHING BUT DO NOT KNOW HOW MUCH." "COULDN'T BEGIN TO SAY."

018LD ANSWERED \$100 -- "I JUST DON'T HAVE THE MONEY. IF I MADE A SALARY THEN I'D PAY MORE. I'D HAVE TO CONSIDER WHAT WOULD HAPPEN TO MY FAMILY IF I PAID MORE." FOR 2 EPISODES THE SUBJECT ALSO ANSWERED \$100 -- "JUST COULDN'T PAY ANY MORE."

091IM ANSWERED \$100 FOR 1 EPISODE AND \$200 FOR 2. "FAIR AND REAL (REALISTIC)."

023WF ANSWERED NON-\$0 AND #2 -- "CANNOT PUT A PRICE TAG ON IT."

072FD ANSWERED \$0 AND #3 -- "IF MYOCARDIAL DAMAGE BEING DONE, WOULD BE WILLING TO PAY TO AVOID THAT -- I'M NOT SURE IT IS. FOR THE PAIN ONLY I AM WILLING TO PAY NOTHING. THE PAIN AVOIDANCE IS NOT WORTH PAYING ANYTHING TO ME. IF I WAS PAYING TO AVOID THE RISK OF AN MI, AND I AM NOT SURE ABOUT THAT, I MIGHT BE WILLING TO PAY SOMETHING." INTERVIEWER DID NOT PRESS HERE: "YOU SHOULD ANSWER ACCORDING TO YOUR KNOWLEDGE AND BELIEFS ABOUT ANGINA -- LATER WE WILL ASK YOU SOME QUESTIONS ABOUT THEM."

033RH ANSWERED \$INFINITE AMOUNT -- "INDEFINITE (SIC) AMOUNT -- WOULD PAY ANYTHING -- \$40-50,000." FOR TWO SUCH EPISODES ALSO ANSWERED "INDEFINITE (SIC), WOULD PAY ANYTHING, LIKE WHAT YOU ALREADY ASKED ME."

107EB ANSWERED \$INFINITE AMOUNT -- "EVERYTHING I HAVE, I'D PAY IT ALL. IT'S (THE ANGINA) THAT BAD." FOR TWO SUCH EPISODES, "PAY ANYTHING, LIKE ABOVE".

031EH ANSWERED \$10,000 FOR 30A -- "IT WOULD BE WORTH ALL THAT I HAD TO AVOID IT -- I HAVE THIS \$10,000 TO DO IT TOO." ANSWERED \$30,000 FOR 30B -- "ALL THAT I HAVE -- ALL STOCKS, BONDS THAT I COULD OBTAIN DURING THE WEEK."

016GC ANSWERED \$0 AND #3 -- SUBJECT COULDN'T ANSWER -- DOESN'T THINK AN EPISODE MEANS ENOUGH TO PAY MONEY -- "DON'T THINK IT IS THAT BIG A DEAL."

039HK ANSWERED \$500 FOR 30A AND \$1000 FOR 30B -- WOULD BE WILLING TO PAY THESE AMOUNTS BUT ACTUALLY ONLY ABLE TO AFFORD, AND WOULD PAY, \$50 AND \$50 RESPECTIVELY FOR #30A AND B.

003GB ANSWERED \$0 AND #4 -- "IT WAS NOT UNCOMFORTABLE ENOUGH NOR LASTED LONG ENOUGH TO WORRY ABOUT."

051JR ANSWERED \$0 AND #4 -- "JUST TAKE CARE OF SELF."

056GB ANSWERED \$12.50 -- SUBJECT RECALLED OTHER WTP QUESTION (#32) AND DIVIDED \$100 BY 8 EPISODES TO COME UP WITH \$12.50. SIMILARLY CALCULATED \$25 FOR #30B.

064DT ANSWERED \$10 FOR 30A AND \$20 FOR 30B -- SUBJECT FIRST ANSWERED \$0 AND #2, BUT THEN SAID IF IT REALLY COULD WORK THAN \$10 AND \$20.

037CK ANSWERED \$0 AND #3 -- "I DON'T THINK NATURE IS MADE UP IN DOLLARS -- I DON'T HAVE ANY (MONEY) STORED UP."

017LC ANSWERED NON-\$0 -- "I WOULD PAY SOMETHING -- THAT'S HARD TO SAY -- JUST NOT SURE WHAT."

106BD ANSWERED \$INFINITE -- "WILLING TO PAY ANYTHING -- BUT YOU CANNOT AFFORD TO PAY EVERYTHING."

001HA ANSWERED NON-\$0 AND #4 -- WOULD BE WILLING TO PAY -- "DON'T KNOW HOW MUCH - WHATEVER IT WOULD TAKE TO BE FREE OF IT."

030RH ANSWERED \$0 AND #3 -- "NOT WORTH IT, I CAN JUST SLOW UP A BIT. IT'S TOO MILD TO WORRY ABOUT."

103RH ANSWERED \$100 FOR 30A AND \$150 FOR 30B -- "NEXT I'D BE WILLING TO PAY, I ONLY BRING IN \$600 PER MONTH ON SOCIAL SECURITY."

067SW REFUSED TO ANSWER 30A -- "THIS IS A SUPERFICIAL QUESTION. IS THERE SUCH A THING?" INTERVIEWER RESPONDED "THIS IS A HYPOTHETICAL QUESTION" AND THE SUBJECT THEN AGAIN COMPLAINED AND ANSWERED "\$200 THEN", BUT STILL USED A REFUSAL TONE OF VOICE. CODED AS REFUSAL.

032WH ANSWERED \$0 AND #4 -- "DON'T HAVE EXTRA MONEY RIGHT NOW."

007FB ANSWERED \$0 AND #4 -- "I DON'T LET IT BUG ME."

083EP ANSWERED \$0 AND #3 -- "IF I KNEW I WOULD HAVE IT AGAIN THEN \$50 --BUT FOR ONLY ONE EPISODE \$0."

094FG ANSWERED \$20 FOR 30A -- "I WOULD BE WILLING TO PAY \$20 FOR A PILL THAT WOULD TAKE AWAY ONE EPISODE." UNABLE TO ANSWER 30B -- "DIFFICULT TO SAY -- UNCERTAINTIES OF BEING FREE FROM ONE OR 8 EPISODES (REFERRING TO #32) IS HARD TO JUDGE." "IF I COULD PAY SOME AMOUNT TO BE FREE OF ALL ANGINA -- I WOULD PAY ANYTHING. I WOULD SELL MY HOUSE AND CAR. BUT JUST ONE EPISODE DOESN'T MEAN A WHOLE LOT." INTERVIEWER NOTE: SUBJECT FIRST ANSWERED \$800-1000, THEN CHANGED ANSWERS

083JS ANSWERED \$10-15 THOUSAND THEN SAID "BUT DON'T HAVE ANY MONEY. IF I HAD MONEY, I'D PAY WHAT I HAD. BUT I DON'T MAKE ENOUGH. I CAN'T TAKE THAT FROM MY FAMILY. IF I WAS RICH I'D GIVE \$10-15 THOUSAND."

008JB ANSWERED \$25 FOR 30A THEN CHANGED TO 0. SUBJECT SAID IF WAS THE WORST ANGINA, HE WOULD PAY \$25, BUT FOR TYPICAL NOTHING. ANSWERED \$25 FOR 30B, THEN TO 0 FOR TYPICAL EPISODE. "IF I SURVIVED THE FIRST ONE, I'M STINGY, I'M BROKE, WOULDN'T PAY ANY MORE."

062JT ANSWERED \$0 AND #3. "IF I COULD DO SOMETHING TO DEAL WITH IT. IF VERY SEVERE OR APPROACHING A HEART ATTACK, THEN I'D PAY."

022CE ANSWERED \$500 FOR BOTH 30A & 30B. INTERVIEWER PROMPT: "MOST YOU COULD AFFORD?" SUBJECT: "RIGHT NOW ABOUT \$500." SUBJECT: \$500 IS THE MOST I CAN GIVE FOR 1, 2, 5 OR WHATEVER."

QUESTIONS 23B AND 24B

057RS "I REALLY CANNOT RECALL A WORST EPISODE -- NONE WAS PARTICULARLY MORE PAINFUL THAN OTHERS." INTERVIEWER PROMPT: "WORST IN TERMS OF CONSEQUENCES?" "NO, I CANNOT PICK ONE OUT."

025JF CLIMBING ON ROOF TO DO REPAIRS

043VL IN BED SLEEPING; HEART ATTACK

082JM INDOORS AT HOME. SITTING. UNSTABLE ANGINA EPISODE. WENT TO VA AND WAS HOSPITALIZED FOR 4 DAYS. HAD MORPHINE AND STREPTOKINASE TREATMENTS. "THAT IS WHEN THEY STARTED ME ON THESE MEDICATIONS AND I'VE BEEN ON EVER SINCE."

109MM AT HOME, DRINKING BEER AND WHISKEY ALL DAY
 0505P TOO LONG AGO, CANNOT REMEMBER
 051JR AT HOME, RESTING, RETURNED FROM BEACH WERE HAD BEEN
 SWIMMING. REMEMBERS FOUL GAS FUMES FROM SEWER, BELIEVES
 AGGRAVATED ANGINA. RETURNED TO HOME, LAID DOWN
 086GS AT HOME, SEXUAL ACTIVITY
 064DT AT HOME, INDOORS, GOT UP FROM COUCH, WALKING DOWN HALL.
 "CAN'T REMEMBER THE BIG ONES -- I TOTALLY BLOCK IT
 OUT."
 037CK AT HOME, IN BED; FOR TWO HOURS TRYING TO SLEEP BUT
 UNABLE TO BECAUSE OF PAIN
 017LC PUTTERING AROUND HOUSE, INDOORS. FIRST REALLY SERIOUS
 ANGINA ATTACK. "THOUGHT IT WAS A HEART ATTACK."
 1063D INDOORS AT HOME, PLAYING AROUND WITH ROOMMATE.
 INTERVIEWER PROMPT: "DO YOU MEAN DURING PRIVATE
 ACTIVITIES WITH YOUR ROOMMATE?" "YES."
 001HA AT HOME, ON PATIO, DOING SAWING AND NAILING
 050RH AT HOME, INDOORS, SITTING AND THINKING ABOUT NEXT DAY IN
 COURT
 103RM AROUND THE HOUSE. "LIKE TO PUT OUT OF MY MIND --
 DIFFICULT TO REMEMBER THESE THINGS."
 067SW INDOORS, RECEPTION HALL, DANCING WITH WIFE AT PARTY.
 046EM AT HOME IN KITCHEN, SITTING AND DRINKING COFFEE
 032WH IN DOCTORS OFFICE, HAVING MEDICAL EXAM FOR HIGH BLOOD
 PRESSURE PROBLEM
 007FB "DON'T REMEMBER -- ABOUT 1975 BEFORE FIRST HEART
 ATTACK."
 088EP AT HOME IN LIVING ROOM, WATCHING TELEVISION
 094EG AT COURTHOUSE IN DIVORCE COURT. JUDGE RULED AGAINST
 HIM: "LOST HOUSE AND KIDS."
 083JS OUTSIDE WORKING BETWEEN GARAGE & YARD ON BOYS' BIKES
 000JB TOOK BUS TO MORMON TEMPLE IN WEST LA. WALKED BACK DOWN
 HILL TO BUS
 062JT TRAVELING IN MEXICO, TIJUANA, SHOPPING. HAD BEEN
 WALKING ALL DAY, WALKING UP RAMP TO INSPECTION AREA,
 RETURNING TO U.S.
 022DE DURING THE MIDDLE OF THE NIGHT WHILE SLEEPING IN
 BEDROOM

QUESTION 27B

043VL OTHER=WENT TO VA -- MILD HEART ATTACK
 082JM OTHER=WENT TO VA
 015RC OTHER=TO HOSPITAL -- CATHETERIZED
 084EB OTHER=WENT TO HOSPITAL
 009DB OTHER="GOT UP, WALKED AROUND, TOOK DEEP BREATHS, AND
 WENT OUTSIDE. MOVED ARMS. SLOWLY, PAIN WENT AWAY.
 THEN SAT DOWN AND WAITED FOR MORNING SUNRISE -- NOT FAR
 OFF."
 100NC MOST IMPORTANT MEANS OF RELIEF="NO RELIEF!"

080WR IN COLORADO, OUTDOORS, CLIMBING STAIRS TO RESTAURANT
 024AF DOING STRESS TEST FOR UCI EXPERIMENTAL STUDY ON CARBON
 MONOXIDE EFFECTS. SCREENING TEST, NO CO THIS DAY.
 SICK FOR TWO WEEKS AFTER.
 015RC WALKING FAST ACROSS PARKING LOT TO KEEP DOCTORS
 APPOINTMENT,
 034EB AT HOME, THINKING; WORRYING ABOUT NEPHEW WHO HAD
 BORROWED CAR AND WENT TO MEXICO. OCCURRED "BEFORE I
 LEARNED TO MODIFY MY LIFESTYLE BETTER."
 009DB BEDROOM, SLEEPING
 100WC JUST HAD GOTTEN UP; GOING TO WATCH CHAMPIONSHIP FOOTBALL
 GAME ON TV. "WAS DOING NOTHING, WATCHING TV. ALL I HAD
 DONE PREVIOUSLY WAS WALK OUT TO GET THE NEWSPAPER."
 012JB BED, SLEEPING. HAD FORGOTTEN TO TAKE MEDICINE BEFORE
 GOING TO BED. WOKE UP 3-4AM
 021RE OUTDOORS IN YARD, TAKING OUT TRASH CANS TO CURB. "AFTER
 IN BED WIFE REMINDS ME TRASH ISN'T OUT. PUT ON GLOVES,
 AND SHOES AND SLACKS. THROW CANS AROUND AND GET TO THE
 STREET." WAS ANGRY -- DOESN'T MATTER IF CANS DON'T GET
 OUT. SUBJECT NOTED ONLY SMALL VARIATION IN ANGINA --
 WAS DIFFICULT TO COME UP WITH EXAMPLE OF WORST
 005CB SAME AS TYPICAL -- "JUST DON'T NOTICE ANY GREAT
 VARIATION
 108JA INTERVIEWER DID NOT ASK 22B TO 28B
 018LD AT HOME, NIGHT SLEEP. HAD HAD CHEST PAINS ON AND OFF
 DURING THE PREVIOUS DAY.
 052HR WORKING AT OUTDOOR JOBSITE. ALONE, TRYING TO HANDLE
 ELECTRICAL CABLE -- HEAVY EXERTION
 091IM "MY LAST WAS THE WORST." -- SEE PREVIOUS ANSWER FOR
 TYPICAL
 006WB AT HOME INDOORS, ARGUING WITH DAUGHTER-IN-LAW ON PHONE
 023WF AT HOME, HAD WORKED IN YARD DURING DAY AND GONE TO BED
 EARLY. IN BED ABOUT 2 HOURS
 089KC IN LAS VEGAS HOTEL ROOM, STANDING, TALKING TO FRIENDS ON
 PHONE. TIRED
 072FD AT HOME, INDOORS, SITTING TALKING WITH FAMILY IN
 EVENING. "THIS WAS THE FIRST EPISODE THAT I REALLY
 REMEMBER -- IT WAS THE WORST IN TERMS OF SEVERITY OF
 PAIN. CAUSED ME TO THINK ABOUT MY HEART HEALTH."
 033RH PLAYING GOLF IN EARLY MORNING
 107JB INDOORS AT HOME DOING LIFTING WORK
 031EH INDOORS AT HOME, WATCHING BALLGAME ON TV
 07STS TRAVELING TO UNION TRAIN STATION IN LA; HAD ANGINA
 ATTACK WHILE CHANGING FLAT TIRE
 079LB DOING STRESS TEST FOR UCI EXPERIMENTAL STUDY ON CARBON
 MONOXIDE EFFECTS. SCREENING TEST, NO CO
 016GC COMING INTO HOUSE AFTER WALKING THE DOG
 03PHK INPATIENT AT LBVA. SITTING IN CHAIR BESIDE BED
 003GB OUTDOORS ON TENNIS COURT, HITTING A FEW BALLS WITH
 STUDENT. "NOTHING TOO ACTIVE."

021RE OTHER=RELAX
 018LD OTHER=WENT TO HOSPITAL
 006WB OTHER=HUNG UP PHONE, TOLD SELF TO RELAX
 023WF OTHER=RESTING IN BED -- TOOK THREE NITRO -- WENT TO
 HOSPITAL WHEN NO PAIN RELIEF
 089KC OTHER=PARAMEDICS TOOK TO HOSPITAL -- \$12,000 COST
 031EH OTHER=WENT TO DOCTOR WHO ADMINISTERED MEDICATION
 018GC OTHER=TOOK ALKA SELTZER
 039HK OTHER=CALLED NURSE, MOVED TO ICU AND HAD MORPHINE SHOT
 003GB OTHER=WENT HOME AND THEN TO HOSPITAL
 109NM OTHER=PARAMEDICS TOOK SUBJECT TO HOSPITAL
 051JR OTHER=WENT TO HOSPITAL EMERGENCY ROOM
 086GS ONLY TIME SUBJECT HAS EVER TAKEN NITROGLYCERIN
 037CK OTHER=WENT TO VA HOSPITAL. "VA COULDN'T STOP IT (THE
 PAIN)." SUBJECT ADMITTED TO ICU/CCU
 017LC OTHER=SUBJECT WENT TO VA WHERE HE WAS GIVEN A NITRO TO
 RELIEVE THE PAIN -- DID NOT STAY OVERNIGHT
 001HA OTHER=WENT TO VA HOSPITAL
 103RM OTHER=WENT TO VA HOSPITAL, TRANSFERRED TO ICU/CCU, AND
 GIVEN MORPHINE INJECTION
 0673W PAIN WAS NOT RELIEVED BY FIRST NITRO, SO TOOK A SECOND
 046EM OTHER=PARAMEDICS CALLED, AWAKE IN HOSPITAL. "COULD HEAR
 BUT NOT SEE THEM."
 032WH OTHER=WENT TO HOSPITAL
 007FB OTHER=HOSPITALIZED AT VA
 088EP OTHER=PARAMEDICS ADMINISTERED MORPHINE
 094FG OTHER=PAIN NOT RELIEVED LASTED HOURS. ADMITTED TO
 HOSPITAL ICU/CCU. PAIN KILLERS ADMINISTERED, CHEST PAIN
 LASTED HOURS
 083JS CALLED WIFE, WENT TO THE HOSPITAL
 008JB WAITED ON BUS; 3 NITRO'S INSIDE OF 5 MINUTES
 022CE TOOK 2 NITROS. "FELT KIND OF FUNNY." CHEST PAIN LEADS
 TO ANXIETY WHICH LEADS TO DEPRESSION. TOOK NITRO PAIN
 OVER FAST. "WAS OVER ABOUT AS FAST AS IT STARTED--I
 DON'T KNOW (IF NITRO WORKED)--THEY ALL ARE OVER PRETTY
 FAST." "MOST GO AWAY IF I JUST STOP AND REST."

QUESTION 288

043VL SUBJECT DID NOT WANT TO ALARM SISTER WHOM HE LIVED WITH
 -- SUFFERED WITH CHEST DISCOMFORT ALL DAY BEFORE DRIVING
 SELF TO VA AT 4PM IN AFTERNOON
 009DB OTHER=TREATMENT ITSELF IS A HAZE. THINKING OF BOTHER
 OF DEALING WITH INSURANCE, MEDICAL TEAMS, ETC
 021RE OTHER=THINKING OF GETTING INTO UCI LASER TREATMENT
 PROGRAM
 018LD COST OF HOSPITALIZATION TOTALLED \$30,000 FOR 12-20 DAY
 STAY. INSURANCE PAID MOST OF THIS BILL. SUBJECT HAD TO
 RETURN TO HOSPITAL AFTER A COUPLE DAYS AT HOME -- STILL
 OWES HOSPITAL \$5000 FOR THAT TIME
 023WF VERY SEVERE PAIN IN ARM

089KC HOSPITALIZATION COST \$18,000 SINCE WAS NOT HOSPITALIZED
 AT VA FACILITY OR PRE-SCHEDULED
 033RH THIS EPISODE CAUSED THE SUBJECT TO SEE A CARDIOLOGIST --
 EVENTUALLY WENT TO UCI'S DR. TOBIS FOR ANGIOPLASTY
 031EH PAIN AND DISCOMFORT WERE THE "ONLY THINGS ON MY MIND"
 109MM OTHER="JUST HAVING DISEASE"
 051JR OTHER="IMMINENT DEATH"
 064DT OTHER="DON'T KNOW WHAT IT WAS."
 030FH OTHER="THINKING ABOUT COURT CASE THE NEXT DAY --DID NOT
 WORRY PARTICULARLY ABOUT DISCOMFORT OR HOT FLASH
 (REACTION TO NITRO)."
 103RM OTHER="DEATH"
 094FG OTHER="REALLY MORE CONCERNED ABOUT DIVORCE RESULTS."
 083JB CONCERN ABOUT FAMILY "WHAT WOULD THEY DO WITHOUT ME?"
 082JT OTHER=DEATH. CONCERN ABOUT POTENTIAL HEART ATTACK ON
 #7

QUESTION 22C

025JF AT HOME, INDOORS, WASHING WINDOWS
 057RS OUTDOORS, GOING FISHING, ANXIETY AND WALKING
 043VL INDOORS AT HOME, WATCHING TELEVISION
 082JM SUBJECT DOES NOT NOTICE ANGINA DURING THE DAY -- ONLY A
 PROBLEM AT NIGHT (E.G., MOVING CARS INTO GARAGE) --
 EVEN THEN SUBJECT CHARACTERIZES AS MILD...VIRTUALLY
 SAME AS TYPICAL
 080WR "HARD TO SAY, HAPPENS WHEN I'M SITTING DOWN -- JUST
 THINK ABOUT OTHER THINGS -- GET MY MIND OFF OF IT. IT
 IS SORT OF LIKE WHAT WE TALKED ABOUT (TYPICAL EPISODE).
 CAN'T SAY."
 024AF "DON'T REMEMBER."
 015RC SAME AS DESCRIBED FOR TYPICAL
 084EB "JUST DON'T HAVE MILD BECAUSE I KNOW MY LIMIT AND I STAY
 UNDER IT. THERE ARE MANY THINGS I'D LIKE TO DO BUT
 CAN'T BECAUSE OF PAIN. USED TO BE ANGRY AND UPSET THAT
 I COULDN'T DO BUT NOW STAY BELOW THAT THRESHOLD. WOULD
 LOVE TO DO CERTAIN ACTIVITIES, BUT HAVE LEARNED NOT
 TO!"
 009DB SAME AS DESCRIBED FOR TYPICAL
 100WC INDOORS AT HOME, DOING LIFTING WORK AROUND THE HOUSE,
 EVERYDAY. ARM NUMBS -- TAKE A NITRO. LIGHTHEADED
 012JB AT WORK, WALKING. SUBJECT COULD NOT CITE ANY EXAMPLE OF
 A RECENT MILD EPISODE SO HE GAVE THE BEST GENERALITY HE
 COULD
 0215E OUTDOORS AT HOME, PUTTING BOAT ON ROOFTOP CARRIER ON
 VAN
 0050B SAME AS DESCRIBED FOR TYPICAL. CAN HAPPEN "ANYTIME,
 ANYWHERE, STANDING OR WALKING."
 106JA INTERVIEWER DID NOT ASK 22C TO 22C
 012LD SAME AS DESCRIBED FOR TYPICAL
 050HR SAME AS DESCRIBED FOR TYPICAL. "MOST CASES ARE MILD."
 ANGINA SOMETIMES OCCURS WALKING AT A SLOW PACE.
 SOMETIMES AT REST; SUBJECT IS ABLE TO SLOW DOWN OR REST
 WITHOUT TAKING A NITRO

091IM "DIFFICULT TO REMEMBER" HARD TO RECALL" A SPECIFIC
 INSTANCE, COULD BE ANYWHERE, DOING ANYTHING.

006WB INDOORS AT HOME, SITTING, THINKING ABOUT PAYING BILLS

023WF OUTDOORS, PLAYING GOLF

089KC CAN'T REMEMBER EXACTLY, ANYTIME, ANYWHERE. "COULD BE
 DOING ANYTHING -- RESTING, WALKING, ANYTHING."

072PD SAME AS DESCRIBED FOR TYPICAL. SUBJECT STATES HE RARELY
 TOOK NITRO, JUST SLOWING DOWN WAS SUFFICIENT TO RELIEVE
 PAIN. HE IS HAVING NO EPISODES NOW THAT HE HAS STOPPED
 DIABENESE MEDICATION. THE TYPICAL EPISODES WERE MILD
 AND NEVER REQUIRED STOPPING ACTIVITIES -- JUST SLOWED
 DOWN. HAD ANGINA EPISODES 2, 3, 4 TIMES PER WEEK WHILE
 ON DIABENESE

033RH "CANNOT REMEMBER."

107JB "DIFFICULT TO RECALL A MILD ATTACK. BUT TYPICALLY I'D
 WAIT -- SOMETIMES TAKE A NITRO. STRESS RELATED USUALLY,
 BUT ALSO (OCCURRED) DURING PHYSICAL ACTIVITY."

031EH AT HOME IN FAMILY ROOM WATCHING TELEVISION -- "EXCITED,
 WATCHING WRESTLING".

075TS INDOORS AT HOME, GOING UPSTAIRS FELT SLIGHT PRESSURE

079LB OUTDOORS AT HOME, WATERING YARD

016GC AT HOME IN BED, "WHEN YOU JUST GET UP."

039HK AT HOME IN BED, WAKING, GETTING UP

003GB WALKING FOR EXERCISE ON NEIGHBORHOOD STREETS

109MM OUTDOORS AT HOME, TAKING TRASH CANS TO CURBSIDE

050EB OUTDOORS AT HOME, DOING YARDWORK

051JR WALKING FOR EXERCISE ON NEIGHBORHOOD STREETS. "CAN'T
 REMEMBER ANYTIME, BUT USUALLY WHEN OUT ON WALKS.
 VARIES. SOMETIMES I CAN GO QUITE A WAYS, OTHER TIMES,
 JUST A FEW BLOCKS."

0863B OUTDOORS IN PARKING LOT, WALKING. SUBJECT HAD TO PARK A
 DISTANCE AWAY FROM DESTINATION. HE WALKED, FELT PAIN,
 CLIMBED STAIRS AND FELT MORE PAIN. THEN RESTED ON
 BENCH

064DT INDOORS, AT JOBSITE (CLIENT'S HOME), DOING VACUUMING,
 AND DUSTING. "UP AND DOWN" WORK

037CK WALKING FOR EXERCISE ON NEIGHBORHOOD STREETS

017LC "CANNOT REALLY RECALL. MOST DAYS ARE NOT TOO GOOD. NOT
 REALLY HAVING PAIN BUT DO NOT FEEL GOOD."

1068D COULD NOT RECALL. SUBJECT NOTED: "ALWAYS TAKE NITRO
 PADS -- MY NEIGHBOR DOESN'T USE HIS AND GIVES THEM TO
 ME. I WILL WEAR THEM AT TIMES."

001HA "CANNOT RECALL -- NO LONGER HAVE ANGINA. THEY JUST WENT
 AWAY."

030RH OUTDOORS, BICYCLING FOR EXERCISE ON BIKE PATH. ALSO IS
 TYPICAL. ANGINA IS ALWAYS MILD. "WOULD BE HARD TO
 THINK OF AN EXAMPLE. JUST SITTING HERE RIGHT NOW I
 THINK I COULD FEEL IT A LITTLE -- NOW THAT MIGHT BE
 PSYCHOSOMATIC YOU KNOW." CODED BICYCLE AS EXAMPLE OF
 MILD EPISODE

103RM OUTDOORS, AT WORK, SHOWING PROPERTY TO SOME CLIENTS.
SUBJECT WAS UNLOCKING THE LOCK BOX TO GET KEY TO OPEN
THE FRONT DOOR. SUDDENLY, THE OWNER OPENED THE DOOR.
"IT SHOCKED BOTH OF US." SUBJECT LET THE CLIENTS IN THE
HOME TO LOOK AROUND, THEN HE TOOK A NITRO
067SW INDOORS AT HOME, DURING THIS INTERVIEW WHILE TALKING ON
THE TELEPHONE
046EM COULD NOT RECALL
032WH INDOORS AT HOME, WATCHING TELEVISION. "IF A CAR
BACKFIRES OR THERE IS A SUDDEN NOISE. GET LIGHT-
HEADED."
007FB CANNOT RECALL -- "DON'T LET IT (ANGINA) BUG ME -- CAN'T
LET IT GET TO YOU."
08SEP AT HOME, JUST AFTER GETTING INTO BED FOR NIGHT SLEEP
074PG INDOORS AT HOME, SITTING, MOVING ABOUT THE HOUSE. WHEN
SUBJECT FORGETS TO TAKE MEDICATION
083JS DON'T REMEMBER
008JB AT NIGHT EVERY ONCE IN AWHILE. WHEN SLEEPING
062JT "LIKE WHAT WE TALKED ABOUT BEFORE AROUND THE SHOP."
INTERVIEWERS NOTE; SUBJECT OWNS DIESEL REPAIR SHOP.
022CE VERY MILD. DO NOT HAPPEN EVERY DAY. COUPLE A WEEK AT
MOST.

QUESTION 27C

025JF STOPPED AND LET ARMS REST WHILE STANDING THERE. DID
SEVERAL TIMES. "PAIN WOULD START AGAIN SO I STOPPED AND
NEXT DAY I FINISHED (WASHING WINDOWS)."
023WF OTHER=GO GOLFING EARLY IN THE MORNING TO AVOID HEAT
031EH STOPPED WATCHING TV AND SLEPT
051JR OTHER="REMOVE MYSELF FROM THE NOISE AND PEOPLE -- WALK
WHEN OTHERS ARE NOT AROUND."
067SW CONTINUE AT THE SAME PACE. FIRST TAKE ANTACID. "THIS
MORNING THE PAIN STARTED BEFORE YOU CALLED. I AM JUST
WORKING AROUND THE HOUSE. TOOK ONE (ANTACID) THIS
MORNING ALREADY. THEN, IF IT DOESN'T WORK I TAKE A
NITRO. NO NITRO AS YET TODAY."
032WH OTHER=SUBJECT RUBS SIDE OF NECK (CAROTID)
094PG ANSWERED #5 -- "JUST TAKE MY MEDS -- I FORGET
SOMETIMES."
008JB OTHER=CHANGE POSITIONS: "IF I CAN CATCH IT EARLY, CAN
JUST ROLL OVER, GET OFF LEFT SIDE. MAY HAVE TO GET UP
FOR NITRO."
022CE "MIGHT FALL OVER TO PROTECT PEOPLE ON HIGHWAY AND MY
FAMILY. WAIT A MINUTE."

QUESTION 28C

025JF OTHER="NO BIG DEAL, JOB JUST GOT FINISHED THE NEXT DAY."
 057RS ANSWERED #8 -- CONCERN TO FAMILY "ALWAYS"
 052HR OTHER="NOTHING"
 006WB OTHER="NONE -- SO SELDOM (OCCURS), JUST KEEP ON."
 INTERVIEWER NOTE: AFTER FINISHED ASKING MILD EPISODE QUESTIONS THE SUBJECT SAID "NO, SCRATCH THAT -- I HAD JUST TAKEN ALL MY VITAMINS AND I NEEDED TO EAT."
 PROBE: "CAN YOU THINK OF ANY OTHER ILLUSTRATIONS OF MILD ANGINA?" "NO, THEY HAPPEN SO SELDOM. DON'T STOP -- JUST KEEP ON. NO BIG DEAL. ONLY AWARE OF PAIN FOR 2-3 MINUTES -- VERY MILD."
 107JB ANSWERED "VERY LITTLE" PAIN AND DISCOMFORT, #4. "REALLY NONE OF THE ABOVE" -- BUT "IF HAD TO CHOOSE" THEN #4. CODED AS #4
 016GC OTHER="DON'T THINK ABOUT IT."
 051JR OTHER="ALREADY LOST THE OTHERS (INCOME, ETC.) -- NO BIG DEAL -- IMMINENT DEATH."
 067SW OTHER="NOTHING -- PAIN EXISTS, DOESN'T WANT TO GO AWAY." SUBJECT ALSO NOTED THAT HE SOMETIMES GETS ANGINA WHILE SWIMMING. IT IS USUALLY MILD; HE SIMPLY STOPS FOR 10 MINUTES AND RESTS. ANGINA USUALLY HAPPENS DURING CRAWL STROKE -- SO CHANGES OFF TO BREAST STROKE. NOW ALTERNATES STROKES: BREAST, LEGS, CRAWL.
 098EF OTHER="NONE"
 008JB OTHER="JUST MAD AT MYSELF AT HAVING THE PROBLEM." PAIN AND DISCOMFORT - A LITTLE.

QUESTION 31

024AF ALL ANSWERS TO #31 WERE INITIALLY ASSIGNED A 10 BY THE SUBJECT. INTERVIEWER PROMPT: "IS THERE JUST ONE THAT YOU WOULD SAY IS JUST A LITTLE MORE BOTHERSOME?" "6" SUBJECT WOULD NOT RANK REMAINING EFFECTS ANY LOWER THAN 9 HOWEVER. A,B,C,D,E,F, AND H WERE CODED AS 9, AND G WAS CODED AS 10
 015RC HAD HEART ATTACK DURING SURGERY
 084EB 31A RANKED AT 1 BECAUSE OF VA BENEFITS. 31B -- "WOULD LIKE TO BE MORE PRODUCTIVE." 31G -- "WOULD LIKE PTCA AT MAYO."
 009DB 31E -- NOT APPLICABLE, RETIRED
 100WC 31C -- NOT APPLICABLE, ON DISABILITY
 108JA 31B AND 31E -- NOT APPLICABLE. 31A=1 -- SUBJECT'S MEDICAL EXPENSES ARE TAKEN CARE OF ON MEDICAL
 018LD 31C -- NOT ANSWERED. 31E IS PROBABLY MOST IMPORTANT BUT THERE IS VERY LITTLE DIFFERENCE. B,D,E,F,G, AND H WERE ALL CODED 10.
 052HR 31B AND 31E -- NOT APPLICABLE

006WB 31G -- SUBJECT STATED THAT G IS SLIGHTLY MORE IMPORTANT THAN A AND F (ALSO RATED 9) BUT G IS NOT A 10. 31G CODED AS 9. 31H INITIALLY RATED A 4, UPON INTERVIEWER PROMPT SUBJECT THEN RE-RATED TO 1. 31H CODED AS A 1.

023WF 31B AND 31 E -- NOT APPLICABLE

072PD 31E AND 31F. BOTH RATED 10 -- "BOTH EQUAL IN IMPORTANCE." INTERVIEWER NOTE: SUBJECT DID NOT HAVE THE QUESTIONNAIRE IN FRONT OF HIM DURING THE INTERVIEW -- HAD TO READ OVER THE LIST THREE TIMES TO BE SURE OF CORRECT ANSWERS -- CONFIRMED TO INTERVIEWER'S SATISFACTION.

033RH 31B AND E -- NOT APPLICABLE

107JB 31B WAS INITIALLY RATED A 3, THE LOWEST OF ALL THE EFFECTS. AFTER INTERVIEWER PROMPT, SUBJECT LATER MOVED TO A 1. PROBED ABOUT HOW MOVING 31B FROM 3 TO 1 AFFECT THE SCALE ASSIGNMENT OF THE OTHER EFFECTS, SUBJECT RESPONDED "NO CHANGE, THE 3 TO 1 IS NOT A BIG DIFFERENCE FOR ME -- IT'S OK -- THE LEAST BOTHERSOME."

031EH 31B AND 31E -- NOT APPLICABLE

075TS 31B AND 31E -- NOT APPLICABLE

016GC 31B -- NOT APPLICABLE

109MM SUBJECT RATED ALL EFFECTS 10 -- "ALL BOTHERSOME" INTERVIEWER PROMPT: "IF HAD TO CHOOSE WHICH WOULD BE THE MOST BOTHERSOME?" "ALL WOULD. MAYBE D." "COULD ANY OF THESE BE A 1?" "NO."

050EP 31B AND 31E -- NOT APPLICABLE

051JR 31G AND 31H RATED AS 10 -- "IF HAD TO CHOOSE GUESS H WOULD BE SLIGHTLY MORE, BUT COULDN'T MOVE G DOWN TO A 9."

064DT 31G RATED 3 -- "CANNOT HAVE CABG AGAIN."

037CK 31E -- NOT APPLICABLE. D, F, G, AND H RATED 10. A, B, AND C RATED 1. INTERVIEWER PROMPT: "IS ANY ONE ITEM THAT YOU MARK A 10 MORE BOTHERSOME THAN THE OTHERS?" "NO." SIMILARLY SUBJECT WAS UNABLE TO DISTINGUISH A DIFFERENCE BETWEEN THOSE EFFECTS RANKED 1.

001HA 31B AND 31E -- NOT APPLICABLE

103RM 31A INITIALLY RATED 2 -- AFTER INTERVIEWER PROMPT: 31A MOVED DOWN TO 1 AS LEAST BOTHERSOME. NO OTHER SCALE ADJUSTMENTS FOR THE OTHER EFFECTS. 31A CODED AS 1.

067SW 31A, 31B, AND 31C INITIALLY RATED 2 -- AFTER INTERVIEWER PROMPT, EACH MOVED DOWN TO 1 AS LEAST BOTHERSOME. NO DIFFERENCE BETWEEN A, B, OR C. 31A, 31B, AND 31C CODED AS 1

046EM 31E -- NOT APPLICABLE

032WH 31B -- NOT APPLICABLE

094PG WHEN THE SUBJECT INITIALLY READ OFF HIS PREPARED ANSWERS HE DID NOT HAVE AN ITEM RANKED AT 1. WITH THE INTERVIEWER'S HELP HE REVIEWED ALL THE EFFECTS AND MADE SOME DOWNWARD SHIFTS. 31A WAS INITIALLY CODED AS 6 AND WAS MOVED TO 2. 31C WAS INITIALLY CODED AS 4 AND MOVED TO 1 -- "PROBABLY LEAST IMPORTANT". NO OTHER CHANGES TO RATINGS. 31E AND 31F WERE MOST BOTHERSOME -- "NO DIFFERENCE."

083JS SUBJECT RANKED ALL 8-10. COMMENTS WERE THAT NOBODY WANTS MORE EXPENSES, BUT IF THERE IS NO CHOICE, ITS WHAT "YOU'VE GOT TO DO." "NOBODY WANTS TO HAVE LESS ABILITY TO EARN INCOME." "DON'T WANT TO BE A VESTABLE & CAUSE MONEY WORRY TO FAMILY." "FAMILY IS ALL YOU'VE GOT AFTER YOUR JOB."

008JB IF PAYING MEDICAL EXPENSES WOULD BE MOST BOTHERSOME, BUT JUST EXTRA TRIPS TO GET MEDICAL CARE IS BOTHER.

022CE LESS ABILITY TO EARN INCOME HAD NO ANSWER AS HE HAD ALREADY LOST THE JOB. NON-MEDICAL EXPENSES WOULD BE MANAGED, IT WOULD JUST TAKE LONGER.

QUESTION 32

025JF TREATMENT 2 -- \$200 WAS TOO MUCH. "WOULD TAKE TOO MUCH AWAY FROM FAMILY, ESPECIALLY WIFE."

043VL TREATMENT 22 -- \$200 WAS TOO MUCH. "WITH INCOME COMING IN I COULDN'T AFFORD IT. IF AFFECTED THINGS I LIKE TO DO THEN I'D PAY \$200. IF IT GOT ALOT WORSE MIGHT BE AT HOME AND SAVE \$200 SINCE I WOULDN'T BE GOING OUT. I'D SPEND THAT THEN."

024AF TREATMENT 27 -- WOULD PAY \$1000 "IF I HAD TO AND IF IT REALLY WORKED!"

084EB TREATMENT 21 -- USED TO TAKE NITRO 20 TIMES A WEEK, BUT CHANGED LIFESTYLE & MEDICATION

100WC TREATMENT 24 -- IF WORKING WOULDN'T BE A PROBLEM. KEEP WORKING 2 JOBS

052HR TREATMENT 2 -- LAST CHOICE WOULD BE TOO MUCH, THREATENS FAMILY, "WOULDN'T PUT OUT ON STREET."

006WB TREATMENT 8 -- DECLINED TO ANSWER; "JUST LIKE ASKING QUESTION BEFORE ABOUT MONEY & SALARY."

023WF TREATMENT 9 -- INTERVIEWER PROMPT; "EVEN 10 OR 12 EPISODES MORE PER MONTH?" RESPONSE WAS "NO, NOT WORTH IT."

072FD TREATMENT 5 -- "ASSUMING RISK OF MI WOULD DECREASE, THEN YES I WOULD BE WILLING TO PAY THESE AMOUNTS. O.K. TO DO THIS?" INTERVIEWER INDICATED THAT IT WAS OK TO ASSUME RISK OF MI DECREASED BY AVOIDING ANGINA

016GC TREATMENT 3 -- ANGINA CAN CONTROL ACTIVITIES SO HE CAN'T. PAIN NOT SO IMPORTANT, IT GOES AWAY. IMPORTANT TO DO THINGS YOU WANT. WOULD PAY ANYTHING FOR PERFECT HEART

001HA TREATMENT 23 -- "WHATEVER IT WOULD COST--WHEN IT COMES TO HEART TROUBLE, YOU TAKE CARE OF IT. MY NEIGHBOR DIED OF A HEART ATTACK LAST MONDAY."

030RH TREATMENT 25 -- "RENT IS \$225. INCOME (SSI) \$450. DOESN'T LEAVE MUCH -- I MIGHT PAY \$200 IF IT WAS REALLY SERIOUS ANGINA. BUT I COULDN'T AFFORD ANY MORE."

032WH TREATMENT 21 -- SUBJECT UNDECIDED. "WOULDN'T BE ABLE TO DECIDE RIGHT NOW."

083JS ANSWERED NO. "WHAT MONEY YOU'VE GOT DETERMINES WHAT YOU CAN SPEND. BOTH ON SOCIAL SECURITY, NO MONEY TO SPEND. IF I HAD \$50, I'D PAY IT. IF I HAD \$200 OR \$400, I'D PAY."
062JT ANSWERED YES, YES, NO. "ANYTHING WITHIN MY ABILITY TO BORROW."

QUESTION 33

0253F IF COMPLETELY RELIEVED
043VL "ALL I COULD AFFORD RIGHT NOW."
082JM SUBJECT: "YOU ARE STARTING TO ASK A LOT OF FINANCIAL QUESTIONS. IS THIS A MEDICAL OR FINANCIAL STUDY?"
INTERVIEWER: "THAT IS A GOOD QUESTION. IT IS BOTH. WE ARE CONCERNED WITH THE BEHAVIORAL ADJUSTMENTS YOU MAKE IN YOUR LIFESTYLE AND THE COSTS TO YOU OF YOUR ANGINA. I WILL EXPLAIN OUR MOTIVATIONS WHEN WE COMPLETE THE QUESTIONNAIRE." SUBJECT: "OK."
080WR "WOULD DO SAME FOR WIFE OR FAMILY MEMBERS." INTERVIEWER
PROBE: "WOULD YOU SELL YOUR HOME OR CAR?" "YES, OF COURSE I WOULD. AND I WOULD DO IT FOR MY WIFE TOO IF SHE HAD IT."
015RC WOULD SELL HOUSE IF HAD ONE--SELL CAR, ANYTHING NOT TO HAVE ANGINA
084EB "I WOULD PAY SIZEABLE AMOUNT OF AN INCOME IF I HAD IT. BUT NOT TO THE POINT OF HAVING TO BE A STREET PERSON. IT WOULD BE RELATIVE TO THE AMOUNT I MADE."
021RE IF MEANT SAVING LIFE WOULD PAY
012LD SUBJECT DESCRIBED A CYCLICAL PATTERN--"IF I HAD MONEY I'D PAY, BUT IF I HAD MONEY, I'D BE WORKING & PROBABLY WOULDN'T HAVE ANGINA. I HAVE TO CONSIDER WHAT HAPPENS TO MY FAMILY IF I PAY ALL THE MONEY FOR GETTING RID OF ANGINA. IF MADE \$1 MILLION, WOULD PAY \$900,000."
052HR "BUT HOW MUCH IS TOO MUCH?" CERTAINLY I WOULD JEOPARDIZE MY FAMILY BY PAYING FOR THIS." 003WBOTHER: CAN'T IMAGINE HOW AN ANGINA EPISODE COULD BE AVOIDED BY PAYING SOMETHING."
023WF "NO MONEY VALUE INVOLVED--I JUST PARK MY ASS AND REST. IF SEVERE OR LINKED TO HEART ATTACK I'D MORTGAGE HOUSE TO GUARANTEE TO BE RID OF ALL AND LEAD A PRODUCTIVE LIFE. I WOULD MORTGAGE MY HOUSE AND PAY \$100,000 TO BE RID OF ALL MY ANGINA--BUT WOULD NOT PAY TO AVOID 2 EPISODES."
107JB INTERVIEWER PROMPT: "WOULD YOU PAY ANYTHING TO AVOID THE FEELING?" "YES, I WOULD PAY ANYTHING. EVERYTHING I HAVE."
033RH "ANY AMOUNT, PERIOD. I'D PAY ..."
016GD DOESN'T MATTER UNLESS HEART IS IN GOOD CONDITION. ANGINA IS JUST A SIGNAL. IT DOESN'T BOTHER HIM THAT MUCH TO HAVE MORE OR LESS ANGINA. WHAT'S IMPORTANT IS HIS HEART CONDITION BEING IMPROVED.

109MM COULDN'T REALLY AFFORD EVEN \$100.
105JR OTHER=DON'T HAVE RESOURCES. IF HAD RESOURCES WOULD BE
WILLING TO PAY \$10,000.
064DT ONLY BECAUSE OF LIMITED INCOME
106BD LESS THAN \$300/MO. YOU PAY WHAT YOU CAN AFFORD, IF BACK
WORKING AT \$40,000." PROMPT: "MORE THAN \$300?" "YES."
OTHER=HARD TO SAY--YOU PAY WHAT YOU CAN AFFORD.
001HA PROMPT: ALL ASSETS? "YES, EVERYTHING."
063JB ANSWERED NO. "IF INSURANCE WOULD COVER, ANY AMOUNT.
BUT I HAVE NO MONEY SO I COULDN'T PAY. " OTHER="IF YOU
HAD THE MONEY, YOU'D PAY IT BECAUSE MONEY CAN'T BRING
BACK LIFE. NO MONEY REPLACES LIFE."
008JB ANSWERED \$0 AND \$3. "NOT FOR JUST ONE EACH WEEK."
PROMPT: "WHY?" SUBJECT: "FIRST OFF, I COULDN'T
AFFORD IT." "JUST NOT WORTH PAYING MONEY FOR."
022JT INTERVIEWER NOTE: WOULD PAY SOMETHING BUT NOT AN
INFINITE AMOUNT. "NOT A REAL QUESTION -- TO ME THAT'S
HOW MUCH DO YOU VALUE YOUR LIFE. ANGINA REALLY GRINDS
ME, I FEEL ON THE EDGE. I DON'T LIKE TO FEEL THAT WAY.
I WOULD DO ANYTHING WITHIN MY ABILITY TO PAY. EVEN
BORROW."
022DE ANSWERED \$200. "I'D PAY ALL I COULD AFFORD. AT THIS
TIME, I'D REALLY HAVE TO SCRATCH THE BOTTOM OF THE
BARREL. CUT MY GROCERIES DOWN TO ZERO. BUT I WOULD PAY
\$200/MO." "THESE QUESTIONS ARE KIND OF REVERSE TO ME.
BY ELIMINATING PAIN, I'D GIVE YOU \$200/MO WITHOUT ANY
QUESTION FROM MY CHECK. I'M A PROUD MAN, I WOULD BE
CONTRIBUTING TO MY FAMILY'S LIFE (SIC - LIVIHOOD)
WITHOUT THE PAIN COULD WORK AND PAY. BUT RIGHT NOW I
CAN'T AFFORD ANYTHING -- ZERO."
067SM IF IT WOULD DEFINITELY HELP.
032WH OTHER=I WOULD NOT BE ABLE TO AFFORD \$10 EASILY,
ESPECIALLY NOW.
007FB "IF I HAD THE BUCKS, SHIT, I'D GO THE LIMIT--BUT YOU
GOTTA SAVE SOME FOR BOOZE, YA KNOW WHAT I MEAN?"
094FB "YOU PAY AS MUCH AS YOU CAN AFFORD."

QUESTION 35

REASON SURGERY NOT RECOMMENDED

021RE NO INDICATION OF NEED
 00502 NEVER EVEN DISCUSSED IT
 108JA DON'T KNOW WHY
 018LD NOT A CANDIDATE
 089KD "NOT A CANDIDATE WAS ALL HE SAID"
 050EP "LITTLE ARTERIES EXPANDED ENOUGH TO TAKE OVER"
 037CK NOT A GOOD CANDIDATE FOR SURGERY
 083JS "JUST SAID I DIDN'T NEED IT."
 022DE "COULD NOT SURVIVE IF I HAD IT."

REASON FOR NO SURGERY AFTER POSITIVE RECOMMENDATION

084EB RANDOMIZED TO MEDICAL THERAPY, HOUSTON STUDY
 009DB "I DON'T THINK IT IS NECESSARY YET."
 012JB CHOSE TO TAKE CHELATION THERAPY INSTEAD
 006WB JUST DON'T LIKE THE IDEA OF HAVING BYPASS SURGERY
 033RH HAD ANGIOPLASTY
 109MM RISK TOO HIGH
 051JR DID NOT BELIEVE NECESSARY AND ITS TOO EXPENSIVE
 086GS WOULD PREFER TO HAVE ANGIOPLASTY
 001HA HAD ANGIOGRAM, FOUND SURGERY WAS NOT NECESSARY
 032WH TRIED MEDICAL THERAPY FIRST; RECENT ANGIOGRAM SHOWED
 OCCLUSIONS WERE LESS.

QUESTION 37

084EB ANSWERED #3 - DOCTOR TOLD ME IT WAS NOT HARMED BUT A
 WARNING
 009DB OTHER= NO HARM TO HEART, BUT INDICATES NEED TO CHANGE
 DIET
 072PD ANSWERED #1 - "TO SOME EXTENT," A WARNING SIGNAL TO SLOW
 DOWN, BUT DOES BELIEVE HEART IS HARMED AND DOES NOT
 HEAL.
 016GC ANSWERED #3 - EXCEPT FOR BIG ONE
 050EP OTHER=DON'T KNOW
 008JB ANSWERED #3 - SEVERE ANGINA. WHEN LIFTING OR WALKING,
 THEN WARNING SIGNAL
 062JT ANSWERED #3 - YES. IF PRESSED ON DEFINITELY WOULD CAUSE
 HARM.

QUESTION 39

080WR OTHER="PRESSURE ON ME--FEELS LIKE ITS CLOSING IN ON ME."
 015RC COMMENTED WATCH TV AT START OF DAY AND PLANNED ACCORDINGLY.
 052HR OTHER=CHEST HURTS FIRST, THEN ITS HIGH!
 084EB "HOWEVER. IN LAST YEAR OR TWO ON A SMOGGY DAY, I AM MORE CONTENT TO STAY AT HOME."
 100WC INTERVIEWERS NOTE: AT THIS POINT, SUBJECT SOUNDED EXTREMELY BORED.
 023WF OTHER=IF HOT, AVOID
 079LB OTHER=BREATHING
 039HK OTHER=ANGINA INCREASES. "KNOW IT IS POLLUTION, CARBON MONOXIDE, BECAUSE IF I USE OXYGEN CYLINDER OR ATMOSPHERIC AIR CYLINDER, I HAVE NO ANGINA.
 INTERVIEWER'S NOTE: THIS SUBJECT PARTICIPATED IN EARLIER COMMUNITY MONITORING RESEARCH; HE CARRIED A PERSONAL EXPOSURE MONITOR AND WORE ECG RECORDER."
 051JR
 051JR OTHER=REDUCES WALKING CAPACITY
 008JB "IN THIS NEIGHBORHOOD DO NOT GET AIR QUALITY. IN CAR, AIR CONDITIONER IS ON, AIR IS CLEAN.
 022CE INTERVIEWERS NOTE; SUBJECT LIVES NEAR FREEWAY.
 SUBJECT: AIR POLLUTION HANGS AROUND MY HOUSE ON CERTAIN DAYS."

QUESTION 40

084EB "AIR POLLUTION & SMOKERS DON'T USUALLY BOTHER ME. SOME IN LAST FEW YEARS BUT DON'T REALLY CARE, WILL VISIT WITH ANYONE, IF THEY WILL COME AROUND."
 001HA COMMENT BY SUBJECT: "NEVER AFFECTS ME--NEVER BOTHERS ME AT ALL. I CAN GET ALONG FINE, BUT AFFECTS MY NEIGHBORS ABOUT EVERY DAY."
 106BD DON'T KNOW HOW OFTEN THERE IS AIR POLLUTION, NEVER FOR ME, BUT IT DOES BOTHER MY NEIGHBORS--." PROMPT: OK, FOR THE HEALTH OF OTHERS?
 016BC DOESN'T KEEP TRACK

QUESTION 41

025JF OTHER=GO TO DESERT FOR 3-6 DAYS, JUST PULL UP IN CAMPER AND WAIT IT OUT FOR A WHILE.
 015RC OTHER=KEEP FANS RUNNING & PUSH BAD AIR OUT.
 072FD DOES NOT BELIEVE ANGINA IS ASSOCIATED WITH AIR POLLUTION IN HIS CASE.
 016GC OTHER=DON'T NOTICE IT.
 103RM OTHER=REST IN BED.
 046EM OTHER=STAY INDOORS--AIR CONDITIONER RUNNING ALWAYS IN BAD WEATHERS.
 032WH OTHER=WITH AIR CONDITIONER ON.
 083JT OTHER=GO IN, RUN AIR CONDITIONER

QUESTION 42

084EB "I WOULDN'T ATTEMPT TO MAKE JUDGEMENT ON AIR POLLUTION. I AM A LOUSY JUDGE OF AIR POLLUTION.
 100WB AIR POLLUTION HIGH (5) IN SUMMER WALKING ON CITY STREETS. AIR POLLUTION MEDIUM (3) IN SMOKING AREAS OF INDOOR PUBLIC PLACES.
 012LD DON'T DRIVE AT ALL IN RUSH HOUR SO DON'T KNOW AIR POLLUTION LEVELS. NEVER OUTDOORS BUT TO WALK TO CAR. RUN THE AIR CONDITIONER ALL THE TIME.
 033RH "WE REALLY DON'T HAVE AIR POLLUTION HERE IN LAGUNA HILLS.
 003GB "NOT REAL OBJECTIVE" -- LIVE CLOSE TO BEACH.
 083JE ANSWERED H=3. "OF COURSE ONCE IN, ITS IN."
 022CE ANSWERED E=3, WHEN AIR POLLUTION HANGS AROUND HOUSE A
 5

QUESTION 43

016GC USED TO MAKE \$45-49,000 BUT REFUSED TO INDICATE CURRENT ANNUAL INCOME.

ADDITIONAL COMMENTS

057RB "I FEEL STRONGLY THAT POLLUTION AFFECTS ANGINA. WHEN THE AIR IS BAD, I FEEL DISCOMFORTED, EVEN IF DON'T HAVE THE ATTACK. I JUST DON'T FEEL GOOD PERIOD. MY WIFE KNOWS WHEN I AM HAVING AN ATTACK, ALMOST AS SOON AS I DO. MY FACIAL EXPRESSION MUST CHANGE. COLOR OF SKIN. AT LAST SUNDAY'S ATTACK, SHE FORCED ME TO TAKE NITRO & NIFEDIPINE. GOT COLOR BACK IN MY FACE, SHE COULD SEE IT. IT IS SOME WORRY TO HER." "NEVER AWARE OF MI, HAS BEEN SILENT. DOCTORS TELL ME 'BOTTOM OF HEART'."

043VL DURING CALL TO SET UP APPOINTMENT TO DO INTERVIEW. SUBJECT WANTED TO KNOW REASONS FOR ASKING QUESTION 32. "THOUGHT PERHAPS THE GOVERNMENT HAD CUT BACK YOUR RESEARCH FUNDS AND YOU WERE GOING TO ASK FOR FUNDS." ALSO WANTED TO KNOW IF PERHAPS WE HAD SOME MEDICAL TREATMENT THAT WE KNEW WOULD GET RID OF ANGINA BUT WEREN'T MAKING PUBLIC. ASSURED HIM WE WERE NOT AWARE OF ANY MIRACLE DRUG BUT OF COURSE THERE WAS CONTINUAL RESEARCH IN THIS FIELD AS IN OTHER DISEASES; OUR PURPOSE WAS A HYPOTHETICAL QUESTION TO EXPLORE LIFESTYLE ADJUSTMENTS AND WHAT MODIFICATIONS ONE WOULD BE WILLING TO MAKE TO AVOID ANGINA. ASSURED HIM OUR FUNDING WAS COMPLETE AND QUESTION 32 DID NOT REGARD RESEARCH FUNDS. FULLY DEBRIEFED AFTER THE QUESTIONNAIRE WAS COMPLETED. EXPLAINED MOTIVATION AND REASONING BEHIND QUESTIONS. SUBJECT SEEMED SATISFIED. HE SAID HIS SISTER MAY HAVE ANSWERED THE QUESTIONNAIRE VERY DIFFERENTLY, MUCH HIGHER DOLLAR AMOUNTS DUE TO SEVERE AND DEBILITATING HEART PROBLEMS. HE HIMSELF CHARACTERIZES HIS PROBLEM AS MILD, "JUST NOT WORTH IT TO PAY MONEY TO AVOID HAVING ONE OR TWO ANGINA EPISODES--I JUST TAKE A NITRO NOW--BUT IF I HAD A REAL BAD ONE LIKE OTHER PEOPEL, THEN I WOULD BE WILLING TO PAY A LOT MORE." (SISTER PASSED AWAY WITHIN LAST YEAR FROM HEART CONDITION.)

080WR DURING DEBRIEFING, "WAS IN KLEINMAN STUDY." "DIDN'T HAVE CHEST PAIN THEY WANTED." "WHAT IS ANGINA?" EXPLAINED WHAT ANGINA WAS IN TERMS OF A SUPPLY-DEMAND MODEL, ALSO EXPLAINED WHY CO IS BELIEVED TO BE A PROBLEM.

015RC DURING INTERVIEW SUBJECT COMMENTED THAT BEFORE SURGERY WAS TAKING 200 NITRO'S PER MONTH.

084EB DURING INTERVIEW SUBJECT COMMENTED THAT FIRST TWO OR THREE YEARS AFTER HEART PROBLEMS WERE DIAGNOSED, HE WAS AT THE HOSPITAL 3, 4, 5 TIMES A YEAR. HAD A HARD TIME MAKING AN ADJUSTMENT IN LIFESTYLE. WANTED TO DO MORE THAN WAS ABLE. EVEN THE "FACT THAT I WAS ILL WAS STRESSFUL. FINALLY RESIGNED MYSELF AND CHANGED MY LIFESTYLE."

100WC CANNOT PUT A MONETARY VALUE ON THE FRUSTATION AT NOT BEING ABLE TO DO DESIRED ACTIVITIES LIKE WORKING AT A JOB--ALSO LOSS OF SELF-ESTEEM, DIGNITY. ANXIETY ABOUT HAVING A HEART ATTACK DIFFICULT TO VALUE. CANNOT GO ANYWHERE TO EAT, NO RESTAURANTS SERVE HEART DIET FOOD, ALL I CAN HAVE IS SALADS. THIS IS A CAMPING & SKIING FAMILY, CANNOT DO ANY OF THOSE THINGS ANYMORE.

021RE BECAUSE OF DIABETES AND HYPERTENSION AND THEIR EFFECTS ON ORGANS, I LIKE TO KEEP IN AS GOOD SHAPE AS POSSIBLE. THEREFORE KEEP UP LAWN AND CEMENT WORK INSTEAD OF EXERCISE IN ARTIFICIAL SENSE; I.E., EXERCISE BINE, ROWING EQUIPMENT. JOINED SPA TO STAY FIT BUT HAVEN'T USED IN ONE AND A HALF YEARS. IT HAS A JACUZZI AND SWIMMING POOL TO USE YEAR ROUND BUT DON'T. EXERCISE AND LOSE WEIGHT BEST WAY TO STAY FIT BUT REALLY STRUGGLE WITH WEIGHT.

005CB SUBJECT HAD JUST WALKED IN DOOR WHEN CALLED FOR INTERVIEW. INTERVIEWER OFFERED TO MAKE APPOINTMENT AND CALL BACK ANOTHER TIME BUT SUBJECT PREFERRED TO LAY DOWN ON BED AND DO INTERVIEW AS IT WOULD HELP HIM TO TAKE HIS MIND OFF WORRIES. GOT REAL "UPSET" YESTERDAY. COULDN'T SLEEP WELL LAST NIGHT. TIRED AND FEELING POORLY; CAME HOME FROM WORK. WHILE DOING INTERVIEW, HE WAS "SWEATY" ON ARMS AND BODY. THIS IS AS BAD AS IT GETS. BUT EVEN MILD ANGINA GET SAME TREATMENT, NITRO, REST AND NAP. HAS NOT BEEN FEELING WELL LATELY. HAS APPOINTMENT AT VA TOMORROW.

018LD WORKED FOR YEARS AS PIPEFITTER, WELDER. IN 1981 SET UP OWN SHEET METAL SHOP. RAN IT FOR ABOUT A YEAR. DOCTOR TOLD HIM TO GET OUT. COULD NO LONGER HANDLE IT SO TURNED IT OVER TO HIS SON AND SON-IN-LAW. KEPT PUTTING MONEY INTO IT TO KEEP IT AFLOAT. BUT HAD TO DECLARE BANKRUPTCY.

052HR "HOW DO YOU ASK PEOPLE THESE THINGS? HARD TO VALUE."
091IM MANAGES SELF-STORAGE COMPLEX, HOME ON PREMISES.
006WB WAS ELECTROCUTED AT WORK IN 1983. AFTERWARD DEVELOPED HEART PROBLEMS. LUNGS AND HEART MORE SENSITIVE TO SMOG. ANGINA IS DIFFERENT BY SEASON. WILL SEND INFORMATION BUT COULD NOT FIND DIARY HE KEEPS ON ANGINA FREQUENCY. WHEN HE DEVELOPED HEART PROBLEMS, WAS OFF WORK 18 MONTHS. WHEN RETURNED TO WORK, WANTED TO BE RETRAINED FOR ANOTHER POSITION BUT WAS NOT ACCEPTED. IS WORKING MANY HOURS, GRAVEYARD SHIFT - SAN ONOFRE NUCLEAR.

023WF SUBJECT HAD TIME FOR QUICK REVIEW OF QUESTIONNAIRE OVER PHONE. WILLING TO DO QUESTIONNAIRE WHEN CALLED. HAD QUESTIONNAIRE IN FRONT OF HIM AS INTERVIEWED. AT END OF QUESTIONNAIRE SAID THAT FOR OTHERS, FINANCES MIGHT BE MORE IMPORTANT. NOT PARTICULARLY FOR ME, I WORRY ABOUT ME. KILLED TWO KIDS IN TRUCK/AUTO ACCIDENT. WENT THROUGH THERAPY. I AM RESPONSIBLE TO MYSELF.

089KC AT END OF QUESTIONNAIRE, SUBJECT SAID IT WAS A GOOD QUESTIONNAIRE, WOULD NOT ADD ANYTHING. LIVED IN AUSTRALIA FOR 17 YEARS OFF AND ON.

072FO SUBJECT WELL EDUCATED IN CARDIOVASCULAR FUNCTIONING. HIGHLY EDUCATED WITH DEGREE IN BIOMEDICAL ENGINEERING.

107JB QUESTIONNAIRE COMPLETED DURING TWO SESSIONS. FIRST SESSION COMPLETED QUESTIONS 1-33. REMAINDER OF QUESTIONNAIRE DURING SECOND SESSION. SUBJECT MANAGES MINI-WAREHOUSE AND THEREFORE LIVES AND WORKS AT HOME. WAS ENGINEER IN MACHINE TOOL INDUSTRY. CURRENTLY NEAR FREEWAY IN AIRPORT AREA. SUBJECT STATED THAT THE ANTICIPATION OF THE ATTACK, THE DISCOVERY THAT YOU ARE ABOUT TO HAVE AN EPISODE INCREASES THE CHANCE, THE INTENSITY AND THE DURATION OF THE ATTACK. KNOWING ONE'S LIMITATIONS, HELPS TO MINIMIZE THE EFFECTS. DREAD OF THE ATTACK: OH WELL, HERE IT COMES, SIT DOWN, CONCENTRATE, MEDITATE.

033RH SUBJECT HAD CAREFULLY COMPLETED QUESTIONNAIRE. COMPLETELY QUESTIONNAIRE QUICKLY. HAD TO STOP HIM ON OCCASION TO MAKE SURE HE HAD CAREFULLY CONSIDERED EACH QUESTION.

075TS SUBJECT LIVES ON COAST AND DOES NOT BELIEVE THERE IS TOO MUCH SMOG.

079LB SUBJECT DID NOT LIKE FINANCIAL QUESTIONS. FELT THEY WERE UNRELATED.

039HK SUBJECT DID NOT HAVE QUESTIONNAIRE IN FRONT OF HIM. BUSES, AUTOS ARE VERY BAD TO DRIVE BEHIND, HAVE TO PULL TO SIDE OF ROAD AND WAIT IF STUCK BEHIND ONE.

003GB SUBJECT WAS ASKED AT END OF INTERVIEW IF HE HAD ANY ADDITIONAL COMMENTS. HE STATED QUESTIONNAIRE WAS THOROUGH, BUT THAT THERE WERE NO QUESTIONS ON HIGH BLOOD PRESSURE.

109MM SPANISH SPEAKING HOUSEHOLD. SOME QUESTIONS REALLY EASY TO ANSWER, SOME CONFUSING AT FIRST. PRETTY FAIR UNDERSTANDING OF QUESTIONNAIRE AND ANSWERED CONSCIENTIOUSLY.

050EP SUBJECT IS EXPERIENCING DIFFERENT PAIN THAN HE HAS HAD BEFORE. HE IS NOT SURE THE PAIN HE HAS NOW IS ANGINA.

086GB SUBJECT WAS EDUCATED IN OPHTHAMOLOGY IN ENGLAND, PRACTICED IN ENGLAND & AFRICA BEFORE COMING TO U.S.

037CK SUBJECT MAILED QUESTIONNAIRE BACK TO RESEARCHER. ADDITIONAL QUESTIONS WERE OBTAINED DURING PHONE CALL.

107LC SINCE CABS 9 YEARS AGO, ONLY ANGINA PAIN IN NECK AND JAW. THEN PAIN BECAME MORE SHARP (LIKE A KNIFE) NOW VA HAS RE-EVALUATED AND SAYS ANGINA PAIN IS BELIEVED TO HAVE TAPER OFF AND NEW PAIN IS DUE TO REGURGITATED ACID IRRITATING SIDE OF THROAT. WILL GET COMPLETE DIAGNOSIS WITHIN WEEK. JUST STARTING ON MYLANTA, SEEMS TO GIVE SOME RELIEF FROM SHARP PAIN IN NECK. FOR A PERIOD OF TIME, COULD NOT LAY DOWN AND GET TO SLEEP, NOW CAN TAKE MYLANTA. "THROAT PAIN REPLACED ANGINA PAIN."

001HA SUBJECT DEBRIEFED MINIMALLY, HE DID NOT REALLY SEEM INTERESTED TO HEAR ABOUT IT AT THIS TIME, DOES WANT TO HAVE REPORT SENT TO HIM. SUBJECT NOTED DURING ANSWER OF QUESTION 32, THAT NEIGHBOR DIED TWO DAYS AGO OF A HEART ATTACK.

030RH "THE WAY SOCIETY TREATS YOU IS DIFFERENT--FRIEND TREATS ME DIFFERENTLY BECAUSE OF THE HEART ATTACK. THEY THINK YOU ARE GOING TO DROP DEAD. WHEN MOVING FILE CABINETS, FRIEND HESITATES AND WORRIES."

103RH QUESTIONNAIRE RETURNED VIA MAIL. ADDITIONAL QUESTIONS WERE ASKED DURING FOLLOW-UP INTERVIEW.

067SW RESEARCH SUBJECT HAS VERY SHORT ATTENTION SPAN. JUMPS AROUND FROM QUESTION TO QUESTION, WANTS TO RUSH THROUGH SOME QUESTIONS AND THEN BINGE ON OTHERS, DIFFICULT TO INTERVIEW. HAS LOST WEIGHT DURING LAST YEAR, IN GENERAL ANGINA HAS BECOME LESS OF A PROBLEM SINCE THEN. IS FEELING BETTER, SWIMS DAILY. MINIMIZES HOURS WORKED BECAUSE WANTS TO KEEP UP HEALTH, LEAVES TIME FOR EXERCISE AND NAP EACH DAY. SUBJECT MERCHANDIZES DESIGNER BOXES THAT HE HOLDS PATENT ON FROM HOME. STILL TAKING LITHIUM FROM WESTWOOD VA.

046EM WHEN FIRST ON DISABILITY IN '76 WITH MI, WAS A MESS. TOOK 5 OR 6 YEARS TO GET USED TO IDEA AND ADJUST LIFESTYLE. WOULD SIT HALF A DAY AND WORRY AND FEEL USELESS, NO NEED TO GO ON. WHY AM I HERE? NOW, LEARNED TO ACCEPT IT. CAN'T CHANGE IT AND CAN'T STEW AND FRET ABOUT WHAT I CAN'T CHANGE.

032WH USED TO BE ALL RECREATIONAL--HUNT, FISH, BOTH FRESH AND SALTWATER, CAMP, WALK, HIKE, PLAYING BASEBALL. NOW I FISH ONCE IN A WHILE. CAN'T DO THESE THINGS NOW. USED TO REALLY UPSET ME.

007FB WIFE READ OFF ANSWERS UNTIL QUESTION 22, THEN RESEARCH SUBJECT WAS AVAILABLE.

094PG "I AM GETTING SO I HAVE TO FORCE MYSELF TO DO THINGS I REALLY LIKE TO DO, NICE BOAT ON TRAILER, NEVER THINK ABOUT IT ANYMORE. I NEVER USE IT, HAVEN'T BEEN OUT IN TWO YEARS. AFFECTED MY OTHER FAMILY SO MUCH THAT MY EX-WIFE LOST CONFIDENCE IN ME; COULDN'T HANDLE IT SO WANTED A DIVORCE. LOST HOUSE AND KIDS. HAVE NOW REMARRIED."

083JS HAD NOT BEEN FEELING TOO GOOD FOR COUPLE OF WEEKS. HAD A FEELING OF A STAKE DRIVEN INTO BACK JUST BELOW THE SHOULDER BLADES. WENT TO SEE THE DOCTOR. NO RESULTS. WENT TO A CONCERT, FELT BAD, WIFE TOOK HIM HOME EARLY. TOOK ALCO SELTZER, FELT BETTER. NEXT MORNING, WIFE WENT TO WORK. HE WENT OUT TO WORK ON BIKES FOR GRANDSON AND FELT BAD, CAME IN AND FELT WORSE. SWEAT, PAIN THEN DOWN ON FLOOR. WHEN COULD FINALLY MOVE, CALLED WIFE WHO TOOK HIM TO LOCAL HOSPITAL. WAS THERE 14 DAYS. SWITCH TO VA AS UNABLE TO PAY REMAINING COSTS AFTER INSURANCE. HAVE LEARNED TO ADAPT. ARE RAISING TWO TEENAGE (13 & 14) GRANDSONS LIVING WITH HIM. CAN'T DO AS MUCH AS HE'D LIKE. HAS TO CONSIDER WHETHER TRIP IS WORTH THE PHYSICAL EXERTION. OLDEST GRANDSON HAS DIABETES AND IS AT LA CHILDREN'S HOSPITAL 3 TIMES A MONTH.

00008 SUBJECT COMMENTED ON THE WORST ANGINA EXAMPLE. TOOK BUS TO THE MORMON TEMPLE IN WEST LOS ANGELES. HAD SOME DISCOMFORT ON THE WALK UP THE HILL TO THE TEMPLE. ATTENDED THE SERVICE. AFTER, WALKED DOWN HILL BACK TO THE BUS. RETURNED TO THE BUS ABOUT 10PM. WHEN HE GOT ON, HE SCARED EVERYBODY ON THE BUS. ANGINA HADN'T BEGUN ON WALK, BUT JUST AFTER, HAD TO STAND UP ON BUS TO HELP RELIEVE THE CHEST PAIN (AS IN HIS USUAL STRATEGY). COMPLAINED OF FEELING TIRED ALL THE TIME -- "I THINK I'M GETTING WORSE". (INTERVIEWER COMMENTS) REL SUGGESTED THAT SUBJECT CALL PHYSICIST AT VA TO SCHEDULE CARDIAC EXAM WHILE HOSPITALIZED THIS NEXT WEEK AND MENTION A MORE TEST. TALKED TO SUBJECT ABOUT ANSWERS TO GOI (PERSONAL CLIP) -- ANSWERS REMAIN THE SAME -- WOULD LIKE TO WORK AT A JOB -- SOME SAYS -- LIFE SATISFACTION FROM WORKING AT A JOB IS VERY IMPORTANT TO SUBJECT AND WOULD RATE "4" FOR 9 OR 10. (INTERVIEWER NOTE) SUBJECT IS OF RETIREMENT AGE AND WOULD NOT WANT TO RISK LOSING SOCIAL SECURITY.

00009 BEFORE CASE, ANGINA PAIN WAS 3-4 TIMES PER DAY. STARTED SMOKING WHEN 19 IN THE ARMY -- WHEN DOING A LOT OF MANUAL LABOR, CIGARETTE BURNED AWAY JUST SITTING. "SMOKED 'EM DOWN TO THE COTTON" WHEN DOING SALES IN THE LATER YEARS OF HIS SMOKING HISTORY."

00010 TWO DAYS LAST WEEK -- DEPRESSION/ANXIETY. WAKE AT 7 AM. HAPPENED ABOUT 1 1/2 YRS AGO. ALSO DURING EXCESSIVE HEAT. TAKING HEAVY MEDICATION RIGHT NOW. COULD BE SIDE EFFECTS. "I MISSED A DAY. FELT BETTER." BACK DRIVING NOW. ABLE TO DRIVE AROUND TOWN, GO TO STORE. SUBJECT THANKED INTERVIEWER FOR RECENTLY RECEIVED MILEAGE CHECK. "HE HELPS OUT" AROUND THE HOUSE. HELPS ALOT. MILEAGE PAYMENT FROM PREVIOUS PARTICIPATION IN RESEARCH. "THAT'S ONE OF THE THINGS THAT REALLY THREW ME, I CAN'T WORK. I'D GIVE BACK SOCIAL SECURITY TO WORK A COUPLE THREE MONTHS. I'VE EVEN BEEN THINKING OF PUTTING AN AD IN THE PAPER TO CLEAN CARPETS." BACKED UP COTTON ABOUT 10 YEARS AGO. NEVER SMOKE. WAKE UP AT 7 AM. FELT LACK OF BREATH. LOVED TO DANCE. DANCED ABOUT 30 YEARS. WAS 12-14 WHEN HE STARTED.

Appendix 4

Itemized costs of health services used in the estimation of societal cost of illness. Charges are based upon accounting information from the UC Irvine Medical Center and the Southern California Physicians' Billing Service

Procedure	Cost
<u>Standard Office Visit</u> (At least 1 resting ECG at \$50 is assumed to accompany regular checkup schedule.)	\$60
<u>Emergency Room Charges</u>	\$100 (+ ECG at \$50)
<u>Hospital Room Charges</u>	
ICU/CCU	\$1271 per day
Cardiac Ward	\$615 per day
Semi-Private Medical	\$414 per day
<u>Coronary Arterv Bypass Graft Surgery (CABG)</u> (Includes 6-hours operating room, general anesthesia materials, recovery room, 5-day stay, and ancillary charges. Does not include professional fees.)	\$15,738
<u>Angioplasty (PTCA)</u> (Includes OR costs, anesthesia, technicians, but does not include professional fees.)	\$5,379
<u>Heart Tests</u>	
Standard 12-lead Resting ECG	\$50
Treadmill Stress Test	\$180
Echocardiogram	\$270
<u>Chest X-ray Exam</u>	\$55
<u>Blood Gases</u>	\$120
<u>Intravenous Line</u>	\$25

OBS	SUBJECT	SWKLOSS	TWKLOSS	SWLD	TWLD	WKRED	JOBLOSS
1	1	0.0	0.0	0.00	0.00	0.00	0
2	3	37500.0	37500.0	0.00	0.00	0.00	37500
3	5	17500.0	17500.0	0.00	0.00	0.00	17500
4	6	260.5	434.2	260.55	434.24	0.00	0
5	7	0.0	0.0	0.00	0.00	0.00	0
6	8	3000.0	3000.0	0.00	0.00	3000.00	0
7	9	0.0	0.0	0.00	0.00	0.00	0
8	12	0.0	0.0	0.00	0.00	0.00	0
9	15	0.0	0.0	0.00	0.00	0.00	0
10	16	0.0	0.0	0.00	0.00	0.00	0
11	17	0.0	0.0	0.00	0.00	0.00	0
12	21	0.0	0.0	0.00	0.00	0.00	0
13	22	32500.0	32500.0	0.00	0.00	0.00	32500
14	23	0.0	0.0	0.00	0.00	0.00	0
15	24	0.0	0.0	0.00	0.00	0.00	0
16	25	7500.0	7500.0	0.00	0.00	7500.00	0
17	30	0.0	0.0	0.00	0.00	0.00	0
18	31	0.0	0.0	0.00	0.00	0.00	0
19	32	0.0	0.0	0.00	0.00	0.00	0
20	33	0.0	0.0	0.00	0.00	0.00	0
21	37	0.0	0.0	0.00	0.00	0.00	0
22	39	0.0	0.0	0.00	0.00	0.00	0
23	43	32500.0	32500.0	0.00	0.00	0.00	32500
24	46	0.0	0.0	0.00	0.00	0.00	0
25	50	0.0	0.0	0.00	0.00	0.00	0
26	51	0.0	0.0	0.00	0.00	0.00	0
27	52	0.0	0.0	0.00	0.00	0.00	0
28	57	2500.0	2500.0	0.00	0.00	0.00	2500
29	62	0.0	0.0	0.00	0.00	0.00	0
30	64	2772.4	2772.4	64.10	64.10	2708.33	0
31	67	2942.3	2942.3	2942.31	2942.31	0.00	0
32	72	0.0	0.0	0.00	0.00	0.00	0
33	75	0.0	0.0	0.00	0.00	0.00	0
34	79	32500.0	32500.0	0.00	0.00	0.00	32500
35	80	0.0	0.0	0.00	0.00	0.00	0
36	81	65000.0	65000.0	0.00	0.00	0.00	65000
37	82	0.0	0.0	0.00	0.00	0.00	0
38	83	7500.0	7500.0	0.00	0.00	0.00	7500
39	84	0.0	0.0	0.00	0.00	0.00	0
40	86	576.9	576.9	576.92	576.92	0.00	0
41	88	0.0	0.0	0.00	0.00	0.00	0
42	89	65000.0	65000.0	0.00	0.00	0.00	65000
43	91	42500.0	42500.0	0.00	0.00	0.00	42500
44	94	9086.5	9086.5	961.54	961.54	8125.00	0
45	100	55000.0	55000.0	0.00	0.00	0.00	55000
46	103	2500.0	2500.0	0.00	0.00	2500.00	0
47	106	47500.0	47500.0	0.00	0.00	0.00	47500
48	107	230.8	230.8	230.77	230.77	0.00	0
49	108	12500.0	12500.0	0.00	0.00	0.00	12500
50	109	0.0	0.0	0.00	0.00	0.00	0

Listing of prices charged for heart-related medications taken by IHD subjects. Unless otherwise noted, prices are per 100 capsules/tablets and itemized by generic and name brand classifications for a major chain pharmacy, a privately-owned pharmacy, and the pharmacy of the Long Beach Veteran's Administration Medical Center. Mean prices are presented for generic and name brands sold by the chain and private pharmacies.

MEDICATION		PRICE AT CHAIN PHARMACY		PRICE AT PRIVATE PHARMACY		MEAN GENERIC PRICE	MEAN NAME BRAND PRICE	OVERALL MEAN PRICE	VETERAN'S ADMIN GENERIC NAME
Code	Dosage	GENERIC	NAME BRAND	GENERIC	NAME BRAND				
050	Experimental Drugs unspecified	-----	-----	-----	-----	-----	-----	-----	
100	Nitrate capsules unspecified	-----	-----	-----	-----	-----	-----	-----	
101	Nitroglycerin tablets	3.85	3.85	5.40	5.40	4.63	4.63	4.63	
102	Isordil 5 mg. 10 mg. 20 mg.	6.45 6.85 7.55	16.30 16.00 25.20	6.35 6.75 13.25	13.80 16.60 23.85	6.40 6.80 10.40	15.05 16.30 24.53	10.73 11.55 17.46	
103	Isosorbide dinitrate 5 mg. 10 mg. 20 mg.	6.45 6.85 7.55	16.30 16.00 25.20	6.35 6.75 13.25	13.80 16.60 23.85	6.40 6.80 10.40	15.05 16.30 24.53	10.73 11.55 17.46	
104	Nitro-bid capsules 2.5 mg. 6.5 mg.	7.55 8.35	21.95 26.55	8.05 9.55	20.50 25.35	7.80 8.95	21.23 25.95	14.51 17.45	
105	Cardilate 5 mg. 10 mg.		21.10** 27.55**	DO NOT STOCK DO NOT STOCK		----- -----	21.10** 27.55**	21.10 27.55	
106	Peritrate 10 mg. 20 mg. 80 mg.	5.50 4.50 9.65 S	14.25 16.80 31.65	6.25 6.25 9.65	11.60 14.30 29.20	5.88 5.38 9.65	12.93 15.55 30.43	9.40 10.46 20.04	
107	Persantine (dipyridamole*) 25 mg. 50 mg. 75 mg. (chow)	10.35 13.95 19.45	22.95 33.10 44.00	7.20 11.05 15.95	21.35 30.30 37.90	8.78 12.50 17.70	22.15 31.70 40.95	15.46 22.10 29.33	
108	Sorbitrate 5 mg. 10 mg. 5 mg.	6.45 6.85 -----	16.30 16.00 -----	6.35 6.75 -----	13.80 16.05 13.80	6.40 6.80 -----	15.05 16.03 13.80	10.73 11.41 13.80	
150	Nitrate ointment, unspecified	-----	-----	-----	-----	-----	-----		

*see code 797

**Item not carried by pharmacy. Price would change if stocked.

MEDICATION		PRICE AT CHAIN PHARMACY		PRICE AT PRIVATE PHARMACY		MEAN GENERIC PRICE	MEAN NAME BRAND PRICE	OVERALL MEAN PRICE	VETERAN'S ADMIN
Code	Dosage	GENERIC	NAME BRAND	GENERIC	NAME BRAND				GENERIC NAME
151	Nitropatch (transderm-nitro) packets of 30 5 mg. 10 mg. 15 mg.	----	40.90 45.40 50.00	----	-----	-----	40.90 45.40 50.00	40.90 45.40 50.00	
152	Nitro-bid ointment (Nito) 60 applications 60 mg.	---	9.70	----	9.15	-----	9.43	9.43	
153	Nitrol 60 mg.	----	13.20		10.45	----	11.83	11.83	
155	Nitrong	-----	---	-----	----	-----	-----	-----	
156	Nitrostat all strengths 60 mg. ointment	----- ---	3.85 11.20	-----	5.85 -----	----- -----	4.85 11.20	4.85 11.20	
200	Calcium Channel Blockers, unspecified	---	---	---	---	-----	-----	-----	
201	Calan (verapamil) 80 mg. 120 mg.	----- -----	37.00 48.80	----- -----	32.90 41.60	----- -----	34.95 45.20	34.95 45.20	
202	Cardizem (diltiazem) 30 mg. 60 mg.	----- -----	30.70 48.95	----- -----	30.80 44.95	----- -----	30.75 46.95	30.75 46.95	
203	Procardia (nifedipine) 10 mg. 20 mg.	----- -----	31.25 -----	----- -----	29.40 56.75	----- -----	30.33 56.75	30.33 56.75	
205	Isoptin (verapamil) 80 mg. 120 mg.	----- -----	37.00 48.80	----- -----	32.80 41.60	----- -----	34.90 45.20	34.90 45.20	
300	Beta Blockers, unspecified	-----	-----	-----	-----	-----	-----	-----	
301	Corgard (nadolol) 40 mg. 80 mg. 120 mg.	----- ----- -----	53.30 70.55 91.95	----- ----- -----	45.75 64.80 84.20	----- ----- -----	49.53 67.68 88.08	49.53 67.68 88.08	
302	Corzido (nadolol) 40/5 formulation, 40 mg. 80/5 formulation, 80 mg.	----- -----	72.00 94.95	----- -----	78.35 59.60	----- -----	75.18 77.28	75.18 77.28	

MEDICATION Code Dosage	PRICE AT CHAIN PHARMACY		PRICE AT PRIVATE PHARMACY		MEAN GENERIC PRICE	MEAN NAME BRAND PRICE	OVERALL MEAN PRICE	VETERAN'S ADMIN GENERIC NAME
	GENERIC	NAME BRAND	GENERIC	NAME BRAND				
303 Inderal (propranolol)								
10 mg.	10.35	13.90	11.25	14.20	10.80	14.05	12.43	
20 mg.	10.95	18.10	12.55	19.95	11.75	19.03	15.39	
40 mg.	15.55	23.70	16.95	25.10	16.25	24.40	20.33	
80 mg.	27.25	43.20	30.00	38.75	28.63	40.98	34.80	
304 Inderide (propranolol)								
40/25 formulation, 40 mg.	-----	43.20	-----	37.10	-----	40.15	40.15	
80/25 formulation, 80 mg.	-----	59.20	-----	48.95	-----	54.08	54.08	
305 Lopressor (metoprolol tartrate)								
50 mg.	-----	30.50	-----	27.00	-----	28.75	28.75	
100 mg.	-----	50.55	-----	41.00	-----	45.78	45.78	
306 Tenormin (atenolol)								
50 mg.	-----	51.05	-----	48.50	-----	49.78	49.78	
100 mg.	-----	75.80	-----	72.30	-----	74.05	74.05	
307 Visken (pindolol)								
5 mg.	-----	33.55	-----	30.70	-----	32.13	32.15	
10 mg.	-----	45.70	-----	39.10	-----	42.40	42.40	
400 Quinidine sulfate, unspecified								
200 mg.	11.45	11.45	12.25	11.45S	11.85	11.45	11.65	
300 mg.	21.15	26.55	-----	-----	21.15	26.55	23.85	
401 Quinidex (quinidine)								
300 mg.	-----	47.80	-----	40.70	-----	44.25	44.25	
402 Cardioquin (quinidine)								
2/5 mg.	-----	57.60	-----	45.35	-----	51.48	51.48	
403 Quinidine Gluconate								
	-----	-----	28.50	56.48	28.50	56.48	42.49	
500 Digoxin, digitalis, unspecified								
	-----	-----	-----	-----	-----	-----	-----	
501 Lanoxin (digoxin)								
.125 mg.	-----	5.50	-----	6.30	-----	5.90	5.90	
250 mg.	-----	5.50	-----	6.30	-----	5.90	5.90	
500 mg.	-----	15.95	-----	-----	-----	15.95	15.95	
502 Lanoxicaps (digoxin)								
500 mg.	-----	15.00	-----	-----	-----	15.00	15.00	
100 mg.	-----	15.90	-----	-----	-----	15.90	15.90	
200 mg.	-----	17.50**	-----	13.30	-----	15.40	15.40	
503 Crystodigin (digitalis glycoside)								
	-----	8.00	-----	-----	-----	8.00**	8.00	

**Item not carried by pharmacy. Price would change if stocked.

MEDICATION		PRICE AT CHAIN PHARMACY		PRICE AT PRIVATE PHARMACY		MEAN GENERIC PRICE	MEAN NAME BRAND PRICE	OVERALL MEAN PRICE	VETERAN'S ADMIN
Code	Dosage	GENERIC	NAME BRAND	GENERIC	NAME BRAND				GENERIC NAME
600	Procainamide hydrochloride, unspecified								
	250 mg	10.35	27.65	10.30	25.40	10.33	26.53	18.43	
	375 mg	13.55	37.30	12.10	33.15	12.82	35.23	24.03	
	500 mg	14.15	47.65	13.85	40.50	14.00	44.08	29.04	
601	Pronestyl (procainamide)								
	250 mg	10.35	27.65	10.30	25.40	10.33	26.53	18.43	
	375 mg	13.55	37.30	12.10	33.15	12.82	35.23	24.03	
	500 mg	14.15	47.65	13.85	40.50	14.00	44.08	29.04	
700	Anti-hypertensives, unspecified	----	-----	-----	-----	-----	-----	-----	
701	Hydrochlorothiazide, unspecified								
	25 mg	-----	-----	-----	4.60	-----	4.60	4.60	
	50 mg	-----	-----	-----	4.85	-----	4.85	4.85	
702	Aldactazide	13.30	29.05	12.05	28.95	12.68	29.00	20.84	
703	Aldactone	14.15	29.45	13.15	27.00	13.65	28.23	20.94	
704	Calapres (clonidine)								
	.1 mg	13.15	24.60	21.30	26.80	17.23	25.70	21.46	
	2 mg	28.70 S	39.75	28.70	37.35	28.70	38.55	33.63	
	.3 mg	-----	54.30	-----	44.55	-----	49.43	49.43	
705	Hydrodiuril								
	25 mg	5.00	14.30	4.60	11.75	4.80	13.03	8.91	
	50 mg	5.00	16.05	4.85	12.20	4.93	14.13	9.53	
706	Hygroton								
	25 mg	11.55	31.35	15.65	27.95	13.60	29.65	21.63	
	50 mg	13.55	39.05	12.75	33.20	13.15	36.13	24.64	
	100 mg	15.00	63.10	14.15	50.25	14.58	56.68	35.63	
707	Minipress (prazosin)								
	1 mg	-----	22.00	-----	22.60	-----	22.30	22.30	
	2 mg	-----	32.55	-----	28.35	-----	30.45	30.45	
	5 mg	-----	51.55	-----	43.50	-----	47.53	47.53	
708	Minizida (prazosin)								
	1 mg	-----	-----	-----	32.70	-----	32.70	32.70	
	2 mg	-----	-----	-----	39.00	-----	39.00	39.00	

MEDICATION Code Dosage	PRICE AT CHAIN PHARMACY		PRICE AT PRIVATE PHARMACY		MEAN GENERIC PRICE	MEAN NAME BRAND PRICE	OVERALL MEAN PRICE	VETERAN'S ADMIN GENERIC NAME
	GENERIC	NAME BRAND	GENERIC	NAME BRAND				
703 Nitropress	-----	-----	-----	-----			-----	
710 Tenormin 50 mg. 100 mg.	----- -----	51.05 75.80	----- -----	48.50 72.30		49.78 74.50	49.70 74.05	
711 Dyazide	-----	21.45	-----	22.35		21.90	21.90	
712 Hydropress 25 mg. 50 mg.	9.30 10.35	22.95 32.30	5.40 9.55	21.40 29.50	7.35 9.95	22.18 30.90	14.76 20.43	
713 Hydroxyzine Hydrochloride 10 mg. 25 mg. 50 mg. 100 mg.	11.75 17.20 18.75 -----	33.35 48.50 58.95 -----	13.75 ----- 17.90 17.30	33.35S ----- 58.95S -----	12.75 17.20 18.33 17.30	33.35 48.50 58.95 -----	23.05 32.85 38.64 17.30	
750 Capoten (captopril) 12.5 mg. 25.0 mg. 50.0 mg. 100.0 mg.	----- ----- ----- -----	31.75 35.00 59.45 103.85	----- ----- ----- -----	34.60 37.50 59.05 -----	----- ----- ----- -----	33.18 36.25 58.25 103.85	33.18 36.25 58.25 103.85	
797 Persantine (dipyridamole) 25 mg. 50 mg. 75 mg.	10.35 13.95 19.45	22.95 33.10 44.00	7.20 11.05 15.95	21.35 30.30 37.90	8.78 12.50 17.70	22.15 31.70 40.95	15.46 22.10 29.33	
798 Coumadin, oral (warfarin sodium) 2.0 mg. 2.5 mg. 5.0 mg. 7.5 mg.	----- ----- ----- -----	23.40 24.10 25.95 27.85	----- ----- ----- -----	21.85 22.50 23.70 -----	----- ----- ----- -----	22.63 23.30 24.83 27.85	22.63 23.30 24.83 27.85	
799 Aspirin	.99	2.69	1.39	4.99	1.19	3.84	2.51	
800 Diuretic, unspecified	-----	-----	-----	-----	-----	-----		
801 Furosemide, unspecified 20 mg. 40 mg. 80 mg.	7.55 9.20 22.10	15.80 14.25 27.55	9.10 11.05 16.60	13.15 15.10 25.30	8.33 10.18 19.35	14.48 14.68 26.43	11.40 12.40 22.89	
802 Lasix (furosemide) 20 mg. 40 mg. 80 mg.	7.55 9.20 22.10	15.80 14.25 27.55	9.10 11.05 16.60	13.15 15.10 25.30	8.33 10.18 19.35	14.48 14.68 26.43	11.40 12.40 22.89	

MEDICATION Code/Dosage	PRICE AT CHAIN PHARMACY		PRICE AT PRIVATE PHARMACY		MEAN	MEAN	OVERALL MEAN PRICE	VETERAN'S ADMIN GENERIC NAME
	GENERIC	NAME BRAND	GENERIC	NAME BRAND	GENERIC PRICE	NAME BRAND PRICE		
803 Maxzide (K spiring with hydrochlorothiazide) 50 mg.	-----	36.85	-----	28.55	-----	32.70	32.70	
804 Spironolactone 25 mg.	14.15	29.45	13.15	29.45 S	13.65	29.45	21.55	
805 Potassium replacement Slow K Micro K K-Tab Klotrix	----- ----- ----- -----	11.60 13.15 18.00 17.20	----- ----- ----- -----	----- ----- ----- -----	----- ----- ----- -----	14.99	14.99	
850 Cholesterol lowering medi- cations, unspecified	-----	-----	-----	-----	-----	-----	-----	
851 Colostid 30 packets	-----	22.00	-----	-----	-----	22.00	22.00	
852 Parmacol	-----	-----	-----	-----	-----	-----	-----	
853 Probucol (Iorelco)	-----	45.60	-----	34.10	-----	39.85	39.85	
900 Insulin, unspecified u-100, 10 cc	8.69	12.95 S	9.65	12.95	9.17	12.95	11.06	
951 Diabinese 100 mg. 250 mg.	9.50 11.55	24.50 31.85	11.05 12.05	23.70 34.25	10.28 11.80	24.10 33.05	17.19 22.43	
952 Micronase 1.25 mg. 2.50 mg. 5.00 mg.	----- ----- -----	18.50 27.00 44.15	----- ----- -----	17.05 25.85 34.75	----- ----- -----	17.78 26.43 39.45	17.78 26.43 39.45	
953 Orinase 250 mg. 500 mg.	----- 10.35	15.75 24.75	----- 11.20	----- 19.60	----- 10.78	15.75 22.18	15.75 16.48	
954 Tolinaso (tolazamide) 100 mg. 250 mg. 500 mg.	18.60 32.25 61.45	24.80 47.40 92.85	----- 25.20 -----	----- 34.95 67.45	18.60 28.73 61.45	24.80 41.18 80.15	21.70 34.95 70.80	

MEDICATION		PRICE AT CHAIN PHARMACY		PRICE AT PRIVATE PHARMACY		MEAN GENERIC PRICE	MEAN NAME BRAND PRICE	OVERALL MEAN PRICE	VETERAN'S ADMIN GENERIC NAME
Code	Dosage	GENERIC	NAME BRAND	GENERIC	NAME BRAND				
955	Insulin (Lento, Ultralento) 10 cc's	8.69	-----	9.65	-----	9.17	-----	9.17	
956	Insulin, NPH 10 cc's	-----	-----	9.65	-----	9.65	-----	9.65	
957	Chlorpropamide 100 mg. 250 mg.	9.50 11.50	24.50 31.85	11.05 12.05	23.70 34.25	10.28 11.78	24.10 33.05	17.19 22.41	
958	Penday	-----	-----	-----	-----	-----	-----	-----	
960	Tranquilizers, unspecified	-----	-----	-----	-----	-----	-----	-----	
960	Valium 2 mg. 5 mg. 10 mg.	10.35 13.95 19.65	22.90 26.60 47.45	12.85 18.85 30.10	20.95 28.45 43.90	11.60 16.40 24.88	21.93 27.53 45.68	16.76 21.96 35.28	
960	Xanax .25 mg. 50 mg. 1.00 mg.	----- ----- -----	31.20 40.40 60.80	----- ----- -----	28.75 35.25 50.20	----- ----- -----	29.98 37.83 55.50	29.98 37.83 55.50	
960	Meprobamate 200 mg. 400 mg.	----- -----	----- 5.90	----- -----	4.80 5.95	----- -----	4.80 5.93	4.80 5.93	

YEARLY EXPENDITURES
MEDICAL - COI

ACTUAL COSTS INCURRED

SUBJECT	INSURANCE PREMIUM Q9b	MILEAGE COST Q10 (x * 2 * .205)	OFFICE VISIT Q11b	EXTRA OFFICE VISIT Q12a	ER COST Q15b	OVERNIGHT HOSP STAY Q16	MED TREAT PROGRAM Q17	MEDICATIONS COST Q14	SUM
006WB	348.00	8.20	50.00	-5			348.00	0.00	754.20
023WF	186.00	8.20	0.00		0.00	0.00		0.00	194.20
009KC	0.00	2.87	0.00	0.00	0.00			0.00	2.87
072PD	0.00	20.50	0.00					0.00	20.50
033RH	786.00	0.82	70.00					300.00	1156.82
107JB	1002.00	143.91	0.00	0.00		0.00		336.00	1481.91
031EH	0.00	4.10	0.00	0.00				0.00	4.10
075TS	0.00	0.00						0.00	186.00
0791B	-99	10.25	160.00			1000.00		1440.00	2610.25
016GC	0.00	12.30	0.00	0.00	0.00	0.00		0.00	12.30
039HK	186.00	11.48	0.00		0.00			840.00	1037.48
003GB	270.00	52.48	0.00	0.00		0.00		0.00	322.48
109MM	186.00	225.50	0.00		0.00	380.00		0.00	791.30
091IM	0.00	32.80	0.00					0.00	32.80
052HR	0.00	61.50	0.00	0.00	0.00	0.00		0.00	61.50
018LD	0.00	98.40	0.00					276.00	374.40
108JA	0.00	39.36	0.00	0.00				240.00	279.36
005CB	0.00	36.90	0.00					0.00	36.90
021RE	1008.00	82.00	160.00					0.00	1250.00
0121B	0.00	0.00						900.00	900.00
100WC	216.00	19.68	192.00	0.00	0.00	0.00		276.00	703.68
0090B	618.00	3.69		-5		0.00		132.00	753.69
084LB	186.00	19.68	0.00				0.00	0.00	205.68
015RC	0.00	27.06	0.00					0.00	27.06
024AF	0.00	178.35	0.00	0.00	0.00	0.00		12.00	190.35
025JF	372.00	137.76	0.00					0.00	509.76
057RS	960.00	6.56	78.00			0.00		1200.00	2282.56
043VL	600.00	16.40	70.00					600.00	1286.40
082IM	0.00	55.35	0.00					0.00	55.35
080WR	414.00	82.00	0.00				79.00	0.00	575.00
050EP	186.00	200.90	0.00	0.00	0.00	0.00		-5	386.90
051JR	0.00	32.80	0.00				400.00	480.00	912.80
086GS	0.00	12.30	0.00	0.00				0.00	12.30
064DT	0.00	2.46	0.00					0.00	2.46
037CK	186.00	45.92	0.00	0.00				0.00	231.92
017LC	186.00	12.30	0.00					0.00	198.30
106BC	0.00	3.28	0.00		0.00	0.00		0.00	3.28
0011A	0.00	21.32	0.00	0.00				0.00	21.32
094PG	0.00	55.35	0.00	0.00				0.00	55.35
030RH	0.00	8.20	0.00	0.00			40.00	0.00	48.20
103RM	186.00	7.38	0.00	0.00	0.00	0.00		0.00	193.38
067SW	186.00	30.75	160.00	205.00	0.00	0.00	228.00	0.00	809.75
046EM	192.00	17.22	12.00					168.00	389.22
032WH	186.00	21.32	0.00	0.00			0.00	0.00	207.32
007FB	0.00	0.00						0.00	0.00
088FP	330.00	9.84	0.00	0.00	-5	-5	0.00	0.00	339.84
083JS	702.00	10.25		0.00				0.00	712.25
022CE	0.00	22.14	0.00					0.00	22.14
008JB	186.00	4.92	0.00				0.00	0.00	190.92
062JT	0.00	0.00						0.00	0.00
TOTAL	205.10	41.67	21.64	1 @ 205.00	0	98.57	113.50	146.93	456.73
SD	283.00	54.14	50.94		0	278.50	154.20	323.40	574.86
n=49		n=46	n=44		n=13	n=14	n=10	n=49	n=50

SUBJECT	COI SUM	ANGINA EPISODES PER YEAR	COI/ EPISODE	MAXIMUM WTP	TREATMENT (4 or 8)	MAX WTP/ EPISODE	WTP/COI per EPISODE
006WB	(+) 754.20	6	125.70	-99	8		
023WF	194.20	730	27.00	0.00	4	0.00	0.00
089KC	65002.87	1095	59.36	250.00	4	62.50	1.05
072PD	20.50	104	0.20	500.00	4	125.00	625.00
033RH	1156.82	24	48.20	∞	4	∞	∞
107JB	1721.91	1095	1.57	∞	4	∞	∞
031EH	4.10	18	0.22	500.00	4	125.00	568.18
075IS	186.00	15	12.40	25.00	8	3.12	0.26
079LB	35110.25	104	337.60	50.00	4	12.50	0.04
016GC	(+) 12.30	365	0.03	0.00	4	0.00	0.00
035HK	6458.48	456	14.16	125.00	8	15.62	1.10
003GB	37822.48	9	4202.50	200.00	8	25.00	0.00
109MH	1481.30	104	14.24	100.00	4	25.00	1.76
091IM	42532.80	6	7088.80	75.00	8	9.38	0.00
052HR	261.50	234	1.11	125.00	8	15.62	14.07
018ID	65974.40	6	10995.73	500.00	8	62.50	0.00
108JA	13259.36	104	127.49	300.00	4	75.00	0.59
005CB	18036.90	6	3006.15	100.00	8	12.50	0.00
021RE	1250.00	10	125.00	35.00	8	4.38	0.04
012JB	3400.00	1095	3.10	50.00	4	12.50	4.03
100WC	56183.68	78	720.30	100.00	8	12.50	0.02
009DB	753.69	65	11.60	500.00	8	62.50	5.38
084LB	289.63	78	3.71	∞	4	∞	∞
015RC	27.06	6	4.51	∞	4	∞	∞
024AF	1140.35	24	47.51	1000.00	4	250.00	5.26
025JF	8009.76	10	800.98	100.00	8	12.50	0.02
057RS	4782.56	104	45.99	100.00	4	25.00	0.54
043VL	33786.40	104	324.87	125.00	8	15.62	0.05
082JM	55.35	365	0.15	∞	8	∞	∞
080WR	1730.00	21	82.38	∞	4	∞	∞
050EP	496.90	104	4.78	100.00	4	25.00	5.23
051JR	3662.80	8	457.85	0.00	8	0.00	0.00
086GS	942.30	15	62.82	100.00	8	12.50	0.20
064DT	2710.46	65	41.70	50.00	8	6.25	0.15
037CK	231.92	1095	0.21	0.00	8	0.00	0.00
017LC	1388.30	65	21.36	100.00	8	12.50	0.58
106BC	47503.78	24	1979.30	300.00	4	75.00	0.04
001HA	21.32	1095	0.02	∞	8	∞	∞
094PG	20480.35	65	315.08	2000.00	8	250.00	0.79
030RH	48.20	365	0.13	50.00	4	12.50	96.15
103RM	5998.38	52	115.35	100.00	4	25.00	0.22
067SW	809.75	18	44.99	500.00	4	125.00	2.78
046EM	389.22	6	64.87	1000.00	4	250.00	3.85
032WH	11607.32	21	552.73	10.00	4	2.50	0.00
007FB	0.00	365	0.00	500.00	4	125.00	∞
086EP	339.84	1095	0.31	50.00	4	12.50	40.32
083JS	8422.24	234	35.99	0.00	8	0.00	0.00
022CE	32522.14	730	44.55	1000.00	4	250.00	5.61
008JB	3574.92	300	11.92	0.00	4	0.00	0.00
062JT	0.00	1095	0.00	100.00	8	12.50	0.00

 $\bar{x} = 639.19$

SD = 1934.82

n = 50

 $\bar{x} = 51.43$

SD = 74.89

n = 42

Too inconsistent
to calculate mean

WTP:COI RATIO PER YEAR

SUBJECT	MEDICAL (see other sheet)	LOST DAYS NO PAY Q21d	WORKLOSS LESS HRS WORKED Q21e	LOST JOB (Q21a)	SERVICES HIRED Q20c	Q20h	EQUIPMENT Q20: Q20b, Q20f	COI SUM	MAXIMUM WTP (Q33 x 12)	WTP/COI RATIO
006WB	754.20	-99			0.00	0.00	0.00	(+) 754.20	-99	0.00
023WF	194.20				0.00	0.00	0.00	194.20	0.00	0.00
009KC	2.87			65000.00	0.00	0.00	0.00	65002.87	3000.00	0.05
072PD	20.50				0.00	0.00	0.00	20.50	6000.00	292.68
033RH	1156.82				0.00	0.00	0.00	1156.82	∞	∞
107JB	1481.91	240.00			0.00	0.00	0.00	1721.91	∞	∞
031EH	4.10				0.00	0.00	0.00	4.10	6000.00	1463.41
0751S	186.00				0.00	0.00	0.00	186.00	300.00	1.61
0791B	2610.25			32500.00	0.00	0.00	0.00	35110.25	600.00	0.02
016GC	12.30		-99		0.00	0.00	0.00	(+) 12.30	0.00	0.00
039HK	1037.48				2700.00	600.00	2121.00	6458.48	1500.00	0.23
003GB	322.48			37500.00	0.00	0.00	0.00	37822.48	2400.00	0.06
109MH	791.30				390.00	300.00	0.00	1481.30	1200.00	0.81
091IH	32.80			42500.00	0.00	0.00	0.00	42532.80	900.00	0.02
052HR	61.50				150.00	50.00	0.00	261.50	1500.00	5.74
018LD	374.40			65000.00	300.00	300.00	0.00	65974.40	6000.00	0.09
108JA	279.36			12500.00	480.00	0.00	0.00	13259.36	3600.00	0.27
005CB	36.90			17500.00	500.00	0.00	0.00	18036.90	1200.00	0.07
021RE	1250.00				0.00	0.00	0.00	1250.00	420.00	0.34
012JB	900.00				2500.00	0.00	0.00	3400.00	600.00	0.18
100WC	703.68			55000.00	360.00	120.00	0.00	56183.68	1200.00	0.02
009DB	753.69				0.00	0.00	0.00	753.69	6000.00	7.96
004ED	205.68				84.00	0.00	0.00	289.68	∞	∞
015RC	27.06				0.00	0.00	0.00	27.06	∞	∞
024AF	190.35				300.00	450.00	200.00	1140.35	12000.00	10.52
025JF	509.76		7500.00		0.00	0.00	0.00	8009.76	1200.00	0.15
057RS	2282.56			2500.00	0.00	0.00	0.00	4782.56	1200.00	0.25
043VL	1286.40			32500.00	0.00	0.00	0.00	33786.40	1500.00	0.04
002JM	55.35				0.00	0.00	0.00	55.35	∞	∞
080WR	575.00				480.00	675.00	0.00	1730.00	∞	∞
050FP	386.90				110.00	0.00	0.00	496.90	1200.00	2.42
051JR	912.80				200.00	2550.00	0.00	3662.80	0.00	0.00
086GS	12.30				180.00	750.00	0.00	942.30	1200.00	1.27
064JT	2.46		2708.00		0.00	0.00	0.00	2710.46	600.00	0.22
037CK	231.92				0.00	0.00	0.00	231.92	0.00	0.00
0171C	198.30				0.00	0.00	1190.00	1388.30	1200.00	0.86
106NC	3.28			47500.00	0.00	0.00	0.00	47503.28	3600.00	0.08
001HA	21.32				0.00	0.00	0.00	21.32	∞	∞
094PG	55.35		8127.00		700.00	1600.00	10000.00	20480.35	24000.00	1.17
030RH	48.20				0.00	0.00	0.00	48.20	600.00	12.45
103RM	193.38		2500.00		2000.00	1025.00	280.00	5998.38	1200.00	0.20
067SW	809.75				0.00	0.00	0.00	809.75	6000.00	7.41
046LM	389.22				0.00	0.00	0.00	389.22	12000.00	30.83
032WH	207.32				0.00	0.00	11400.00	11607.32	120.00	0.01
007FB	0.00				0.00	0.00	0.00	0.00	6000.00	∞
088FP	339.84				0.00	0.00	0.00	339.84	600.00	1.76
003JS	712.25			7500.00	210.00	0.00	0.00	8422.25	0.00	0.00
022CE	22.14			32500.00	0.00	0.00	0.00	32522.14	1200.00	0.37
008JB	190.92		3000.00		384.00	0.00	0.00	3574.92	0.00	0.00
062JI	0.00				0.00	0.00	0.00	0.00	1200.00	∞

* no ∞

x = 46.09

SD = 234.44

n = 40

** If ∞ added
in would only

x = 10850.97 x = 3091.43 x = 54.22

SD = 10143.05 SD = 4652.12 SD = 253.98

n = 50

n = 42

n = 34

* * *

BEST ESTIMATE OF SOCIETAL COSTS
MEDICAL - COI

SUBJECT	MEDICATION MEAN	OFFICE VISITS	EMER. ROOM	OVERNIGHT HOSP STAY	SUM
006WB	84.11	220.00			304.11
023WF	1122.68	290.00	150.00	1755.00	3317.68
089KC	696.69	670.00	450.00		1816.69
072PD	181.70	170.00			351.70
033RH	233.64	170.00			403.64
107JB	1620.26	2420.00		16968.00	21008.36
031EH	27.68	170.00			197.68
075IS	0.00	0.00			0.00
079LB	1185.90	400.00		2345.00	3930.90
016GC	442.18	610.00	350.00	3950.00	5352.18
039HK	483.32	290.00	300.00		1073.32
003GB	256.75	580.00		27828.00	28664.75
109HM	936.42	2270.00	750.00	13695.00	17651.42
091IM	280.17	290.00			570.17
052HR	928.92	510.00	150.00	8675.00	10263.92
018LD	1032.07	770.00			1802.07
108JA	321.94	1510.00			1831.94
005CB	1264.80	410.00			1674.80
021RE	406.25	530.00			936.25
012JB	416.26	0.00			416.26
100WC	2320.61	1210.00	250.00	3700.00	7480.61
009DB	57.68	330.00		14000.00	14387.68
084EB	1595.69	230.00			1825.69
015RC	612.69	410.00			1022.69
024AF	27.68	3780.00	150.00	2935.00	6892.68
025JF	109.15	770.00			879.15
057RS	593.34	170.00			763.34
043VL	1295.56	170.00			1465.56
082JM	952.16	230.00			1182.16
080WR	18.52	530.00			548.52
050EP	488.85	1390.00	150.00	1630.00	3658.85
051JR	570.03	290.00			860.03
086GS	392.91	280.00			672.91
064DT	470.50	410.00			880.50
037CK	880.81	620.00			1500.81
017LC	524.41	230.00			754.41
106BC	1459.36	290.00	150.00	2370.00	4269.36
001HA	21.54	170.00			191.54
094PG	297.31	840.00			1137.31
030RH	27.68	220.00			247.68
103RM	1621.03	840.00	1364.00	19134.00	22959.03
067SW	928.93	500.00	150.00	6680.00	8258.93
046FM	686.51	410.00			1096.51
032WH	2429.24	390.00			2819.24
007FB	59.42	0.00			59.42
088EP	640.70	810.00	77.00	33435.00	34962.70
083JS	1077.90	110.00			1187.90
022CE	158.36	590.00			748.36
008JB	1084.56	290.00			1374.56
062JI	475.37	0.00			475.37
	$\bar{x}$ 676.00	575.80	341.62	20800.00	4522.63
	SD 585.20	681.07	356.41	42411.37	7715.34
	n = 50	n = 50	n = 13	n = 15	n = 50