Framingham Heart Study
Longitudinal Data Documentation

The Framingham Heart Study is a long term prospective study of the etiology of cardiovascular disease among a population of free living subjects in the community of Framingham, Massachusetts. The Framingham Heart Study was a landmark study in epidemiology in that it was the first prospective study of cardiovascular disease and identified the concept of risk factors and their joint effects. The study began in 1948 and 5,209 subjects were initially enrolled in the study. Participants have been examined biennially since the inception of the study and all subjects are continuously followed through regular surveillance for cardiovascular outcomes. Clinic examination data has included cardiovascular disease risk factors and markers of disease such as blood pressure, blood chemistry, lung function, smoking history, health behaviors, ECG tracings, Echocardiography, and medication use. Through regular surveillance of area hospitals, participant contact, and death certificates, the Framingham Heart Study reviews and adjudicates events for the occurrence of Angina Pectoris, Myocardial Infarction, Heart Failure, and Cerebrovascular disease.

The enclosed dataset is a subset of the data collected as part of the Framingham study and includes laboratory, clinic, questionnaire, and adjudicated event data on 4,434 participants. Participant clinic data was collected during three examination periods, approximately 6 years apart, from roughly 1956 to 1968. Each participant was followed for a total of 24 years for the outcome of the following events: Angina Pectoris, Myocardial Infarction, Atherothrombotic Infarction or Cerebral Hemorrhage (Stroke) or death. **(NOTE: Although the enclosed dataset contains Framingham data 'as collected' by Framingham investigators, specific methods were employed to ensure an anonymous dataset that protects patient confidentiality; therefore, this dataset is inappropriate for publication purposes. <u>All persons teaching with this dataset are encouraged to ensure all users are aware that this dataset is inappropriate for publication purposes</u>.)**

The data is provided in Longitudinal form. Each participant has 1 to 3 observations depending on the number of exams the subject attended, and as a result there are 11,627 observations on the 4,434 participants.  Event data for each participant has been added without regard for prevalent disease status or when examination data was collected. For example, consider the following participant:

| RANDID | age | SEX | time | period | prevchd | mi_fchd | timemifc |
|--------|-----|-----|------|--------|---------|---------|----------|
| 95148  | 52  | 2   | 0    | 1      | 0       | 1       | 3607     |
| 95148  | 58  | 2   | 2128 | 2      | 0       | 1       | 3607     |
| 95148  | 64  | 2   | 4192 | 3      | 1       | 1       | 3607     |

Participant 95148 entered the study (time=0 or period=1) free of prevalent coronary heart disease (prevchd=0 at period=1); however, during followup, an MI event occurred at day 3607 following the baseline examination. The MI occurred after the second exam the subject attended (period=2 or time=2128 days), but before the third attended exam (period=3 or time=4192 days). Since the event occurred prior to the third exam, the subject was prevalent for CHD (prevchd=1) at the third examination. Note that the event data (mi_fchd, timemifc) covers the entire followup period and does not change according to exam.

The following characteristics or risk factor data are provided in the dataset. Missing values in the dataset are indicated by a period (.). In SAS, missing values are numerically the smallest possible values (for example, <0 or < -99999999).

| Variable | Description | Units | Range or count |
|---|---|---|---|
| RANDID | Unique identification number for each participant | | 2448-9999312 |
| SEX | Participant sex | 1=Men<br>2=Women | n=5022<br>n=6605 |
| PERIOD | Examination Cycle | 1=Period 1<br>2=Period 2<br>3=Period 3 | n=4434<br>n=3930<br>n=3263 |
| TIME | Number of days since baseline exam | | 0-4854 |
| AGE | Age at exam (years) | | 32-81 |
| SYSBP | Systolic Blood Pressure (mean of last two of three measurements) (mmHg) | | 83.5-295 |
| DIABP | Diastolic Blood Pressure (mean of last two of three measurements) (mmHg) | | 30-150 |
| BPMEDS | Use of Anti-hypertensive medication at exam | 0=Not currently used<br>1=Current Use | n=10090<br>n=944 |
| CURSMOKE | Current cigarette smoking at exam | 0=Not current smoker<br>1=Current smoker | n=6598<br>n=5029 |
| CIGPDAY | Number of cigarettes smoked each day | 0=Not current smoker<br>1-90 cigarettes per day | |
| EDUC | Attained Education | 1=0-11 years<br>2=High School Diploma, GED<br>3=Some College, Vocational School<br>4=College (BS, BA) degree or more | |
| TOTCHOL | Serum Total Cholesterol (mg/dL) | | 107-696 |
| HDLC | High Density Lipoprotein Cholesterol (mg/dL) | available for period 3 only | 10-189 |
| LDLC | Low Density Lipoprotein Cholesterol (mg/dL) | available for period 3 only | 20-565 |
| BMI | Body Mass Index, weight in kilograms/height meters squared | | 14.43-56.8 |
| GLUCOSE | Casual serum glucose (mg/dL) | | 39-478 |

| Variable | Description | Units | Range or count |
|---|---|---|---|
| DIABETES | Diabetic according to criteria of first exam treated or first exam with casual glucose of 200 mg/dL or more | 0=Not a diabetic 1=Diabetic | n=11097 n=530 |
| HEARTRTE | Heart rate (Ventricular rate) in beats/min | | 37-220 |
| PREVAP | Prevalent Angina Pectoris at exam | 0=Free of disease 1=Prevalent disease | n=11000 n=627 |
| PREVCHD | Prevalent Coronary Heart Disease defined as pre-existing Angina Pectoris, Myocardial Infarction (hospitalized, silent or unrecognized), or Coronary Insufficiency (unstable angina) | 0=Free of disease 1=Prevalent disease | n=10785 n=842 |
| PREVMI | Prevalent Myocardial Infarction | 0=Free of disease 1=Prevalent disease | n=11253 n=374 |
| PREVSTRK | Prevalent Stroke | 0=Free of disease 1=Prevalent disease | n=11475 n=152 |
| PREVHYP | Prevalent Hypertensive. Subject was defined as hypertensive if treated or if second exam at which mean systolic was >=140 mmHg or mean Diastolic >=90 mmHg | 0=Free of disease 1=Prevalent disease | n=6283 n=5344 |

For Each participant the following event data is provided. For each type of event, '0' indicates the event did not occur during followup, and '1' indicates an event did occur during followup. Only the first event occurring during the interval of baseline (PERIOD=1) to end of followup is provided:

| Variable name | Description |
|---|---|
| ANGINA | Angina Pectoris |
| HOSPMI | Hospitalized Myocardial Infarction |
| MI_FCHD | Hospitalized Myocardial Infarction or Fatal Coronary Heart Disease |
| ANYCHD | Angina Pectoris, Myocardial infarction (Hospitalized and silent or unrecognized), Coronary Insufficiency (Unstable Angina), or Fatal Coronary Heart Disease |
| STROKE | Atherothrombotic infarction, Cerebral Embolism, Intracerebral Hemorrhage, or Subarachnoid Hemorrhage or Fatal Cerebrovascular Disease |
| CVD | Myocardial infarction (Hospitalized and silent or unrecognized), Fatal Coronary Heart Disease, Atherothrombotic infarction, Cerebral Embolism, Intracerebral Hemorrhage, or Subarachnoid Hemorrhage or Fatal Cerebrovascular Disease |
| HYPERTEN | Hypertensive. Defined as the first exam treated for high blood pressure or second exam in which either Systolic is $\geq$ 140 mmHg or Diastolic $\geq$ 90mmHg |
| DEATH | Death from any cause |
| TIMEAP | Number of days from Baseline exam to first Angina during the followup or Number of days from Baseline to censor date. Censor date may be end of followup, death or last known contact date if subject is lost to followup |
| TIMEMI | Defined as above for the first HOSPMI event during followup |
| TIMEMIFC | Defined as above for the first MI_FCHD event during followup |
| TIMECHD | Defined as above for the first ANYCHD event during followup |
| TIMESTRK | Defined as above for the first STROKE event during followup |
| TIMECVD | Defined as above for the first CVD event during followup |
| TIMEHYP | Defined as above for the first HYPERTEN event during followup |
| TIMEDTH | Number of days from Baseline exam to death if occurring during followup or Number of days from Baseline to censor date. Censor date may be end of followup, or last known contact date if subject is lost to followup |

Note that defining Hypertensive requires exam participation and bias can therefore occur. Subjects attending exams regularly have a greater opportunity to be defined as hypertensive. Subjects not attending exams would be assumed to be free of hypertension. Since Hypertension is highly prevalent, this misclassification could potentially be large.

<u>Defining Incident events</u>

Frequently, epidemiologists need to define the population at risk for some disease or event outcome, and individuals who have previously had an event need to be excluded from the analysis so that only new or first events are counted. Incidence or first event rates can be calculated using any of the three examinations as a baseline exam. The variables PREVAP, PREVMI, PREVCHD, PREVSTRK, and PREVHYP will define the population at risk for the outcome of interest. For example, assume we are interested in incident hospitalized myocardial infarction or fatal coronary heart disease. Consider again participant 95148 and participants 477082 and 1140225 whose data are given below.

| RANDID | age | SEX | time | period | prevchd | mi_fchd | timemifc |
|---|---|---|---|---|---|---|---|
| 95148 | 52 | 2 | 0 | 1 | 0 | 1 | 3607 |
| 95148 | 58 | 2 | 2128 | 2 | 0 | 1 | 3607 |
| 95148 | 64 | 2 | 4192 | 3 | 1 | 1 | 3607 |
| 477082 | 38 | 1 | 0 | 1 | 0 | 1 | 1718 |
| 477082 | 44 | 1 | 2119 | 2 | 1 | 1 | 1718 |
| 1140225 | 58 | 2 | 0 | 1 | 0 | 0 | 8766 |
| 1140225 | 64 | 2 | 2172 | 2 | 0 | 0 | 8766 |
| 1140225 | 69 | 2 | 4287 | 3 | 0 | 0 | 8766 |

Participants are often enrolled in an observational study without regard to past medical history. The study investigators will review the medical record to determine if the participant had any pre-existing disease at the time of the first study examination. If pre-existing disease is found, then the data for that subject will reflect prevalent disease at the first exam; however, the subject will continue to be followed for any new events. All participants, regardless of their prevalent disease status, will continue to be followed and events recorded until the study ends, the participant dies, or the participant cannot be contacted to ascertain their status (lost to followup). For participants who enter the study free of disease, the incident events are used to determine prevalent disease status at later exams. For the three participants above, none entered the study with prevalent disease and using period 1 as the baseline exam, the population at risk could be defined using code similiar to the SAS code below:

```
data work; set frmgham; if period=1 and prevchd=0;
```

The data would appear as the following:

| RANDID | age | SEX | time | period | prevchd | mi_fchd | timemifc |
|---|---|---|---|---|---|---|---|
| 95148 | 52 | 2 | 0 | 1 | 0 | 1 | 3607 |
| 477082 | 38 | 1 | 0 | 1 | 0 | 1 | 1718 |
| 1140225 | 58 | 2 | 0 | 1 | 0 | 0 | 8766 |

The population at risk consists of all three participants (prevchd=0) and followup time for the event of hospitalized MI or fatal CHD would be the time indicated under TIMEMIFC. The first two participants (95148 and 477082) would be regarded as having an incident event during followup.

Likewise, the second examination or period=2 could also be used as a baseline exam. The full dataset can be subset to include only those at risk at the start of the second period. For example:

```
data work; set frmgham; if period=2 and prevchd=0;
```

Since time to event is provided as days since the first visit, a new time variable would need to be created so that number of days under study extends from the second exam until the end of followup:

```
newtime=timemifc-time;
```

The revised dataset that includes the population at risk beginning at period=2 and extends until the end of followup would be:

| RANDID | age | SEX | time | period | prevchd | mi_fchd | timemifc | newtime |
|--------|-----|-----|------|--------|---------|---------|----------|---------|
| 95148 | 58 | 2 | 2128 | 2 | 0 | 1 | 3607 | 1479 |
| 1140225 | 64 | 2 | 2172 | 2 | 0 | 0 | 8766 | 6594 |

The population at risk (those free of prevalent disease) now includes only participants 95148 and 1140225. The variable NEWTIME correctly reflects the number of days of followup from the second exam or period=2 until the first event or a censor point.

The same procedure can be used to define the third exam or period=3 as the baseline exam.

For more complex analyses, such as time-dependent analysis, or a counting process style of input, the user would have to subset the population to those free of disease at all exams and event data would have to be modified to reflect when the event occurred relative to the examinations. Consider the following SAS code which would modify the dataset to a counting process style of input for an analysis on the Hospitalized MI-Fatal CHD endpoint. The variable NEWEVNT is modified from MI_FCHD so that the event indicator is '1' only once for each participant. The variables TIME and ENDTIME define the interval the subject is at risk:

```
data analysis; set work; if prevchd=0;
proc sort data=analysis; by randid descending period;
data analysis; set analysis; by randid;
 newevnt=mi_fchd;
 retain exmtime;
 if first.randid then do; endtime=timemifc; exmtime=time; end;
   else do;
     newevnt=0; endtime=exmtime;exmtime=time;
   end;
proc sort data=analysis; by randid period;run;
```

The data would appear, for example, as follows for three participants :

| RANDID | age | SEX | period | time | endtime | newevnt | mi_fchd | timemifc |
|--------|-----|-----|--------|------|---------|---------|---------|----------|
| 11263 | 43 | 2 | 1 | 0 | 2178 | 0 | 1 | 5719 |
| 11263 | 49 | 2 | 2 | 2178 | 4351 | 0 | 1 | 5719 |
| 11263 | 55 | 2 | 3 | 4351 | 5719 | 1 | 1 | 5719 |
| 12629 | 63 | 2 | 1 | 0 | 8766 | 0 | 0 | 8766 |
| 9069458 | 42 | 2 | 1 | 0 | 4362 | 0 | 0 | 8766 |
| 9069458 | 54 | 2 | 3 | 4362 | 8766 | 0 | 0 | 8766 |

SAS PROC CONTENTS PROCEDURE ON FRAMINGHAM LONGITUDINAL DATASET

The CONTENTS Procedure

Data Set Name: WORK.FRMGHAM                    Observations:          11627
Member Type:   DATA                            Variables:             38
Engine:        V8                              Indexes:               0
Created:       14:50 Tuesday, March 2, 2004    Observation Length:    304
Last Modified: 14:50 Tuesday, March 2, 2004    Deleted Observations:  0
Protection:                                    Compressed:            NO
Data Set Type:                                 Sorted:                NO
Label:


                        -----Engine/Host Dependent Information-----

Data Set Page Size:        16384
Number of Data Set Pages:  220
First Data Page:           1
Max Obs per Page:          53
Obs in First Data Page:    35
Number of Data Set Repairs: 0
Release Created:           8.0202M0
Host Created:              WIN_PRO

The CONTENTS Procedure

-----Variables Ordered by Position-----

| # | Variable | Type | Len | Label |
|---|----------|------|-----|-------|
| 1 | SEX | Num | 4 | SEX |
| 2 | RANDID | Num | 8 | Random ID |
| 3 | totchol | Num | 8 | Serum Cholesterol mg/dL |
| 4 | age | Num | 8 | Age (years) at examination |
| 5 | sysbp | Num | 8 | Systolic BP mmHg |
| 6 | diabp | Num | 8 | Diastolic BP mmHg |
| 7 | cursmoke | Num | 8 | Current Cig Smoker Y/N |
| 8 | cigpday | Num | 8 | Cigarettes per day |
| 9 | bmi | Num | 8 | Body Mass Index (kg/(M*M) |
| 10 | diabetes | Num | 8 | Diabetic Y/N |
| 11 | bpmeds | Num | 8 | Anti-hypertensive meds Y/N |
| 12 | heartrte | Num | 8 | Ventricular Rate (beats/min) |
| 13 | glucose | Num | 8 | Casual Glucose mg/dL |
| 14 | prevchd | Num | 8 | Prevalent CHD (MI,AP,CI) |
| 15 | prevap | Num | 8 | Prevalent Angina |
| 16 | prevmi | Num | 8 | Prevalent MI (Hosp,Silent) |
| 17 | prevstrk | Num | 8 | Prevalent Stroke (Infarct,Hem) |
| 18 | prevhyp | Num | 8 | Prevalent Hypertension |
| 19 | time | Num | 8 | Days since Index Exam |
| 20 | period | Num | 8 | Examination cycle |
| 21 | hdlc | Num | 8 | HDL Cholesterol mg/dL |
| 22 | ldlc | Num | 8 | LDL Cholesterol mg/dL |
| 23 | death | Num | 8 | Death indicator |
| 24 | angina | Num | 8 | Incident Angina Pectoris |
| 25 | hospmi | Num | 8 | Incident Hospitalized MI |
| 26 | mi_fchd | Num | 8 | Incident Hosp MI-Fatal CHD |
| 27 | anychd | Num | 8 | Incident Hosp MI, AP, CI, Fatal CHD |
| 28 | stroke | Num | 8 | Incident Stroke Fatal/non-fatal |
| 29 | cvd | Num | 8 | Incident Hosp MI or Stroke, Fatal or Non |
| 30 | hyperten | Num | 8 | Incident Hypertension |
| 31 | timeap | Num | 8 | Days Baseline-Inc Angina |
| 32 | timemi | Num | 8 | Days Baseline-Inc Hosp MI |
| 33 | timemifc | Num | 8 | Days Baseline-Inc MI-Fatal CHD |
| 34 | timechd | Num | 8 | Days Baseline-Inc Any CHD |
| 35 | timestrk | Num | 8 | Days Baseline-Inc Stroke |
| 36 | timecvd | Num | 8 | Days Baseline-Inc CVD |
| 37 | timedth | Num | 8 | Days Baseline-Death |
| 38 | timehyp | Num | 8 | Days Baseline-Inc Hypertension |

Distributions of selected variables by period and sex

Examination cycle 1

| Means selected Risk factors | N | NMiss | Mean | Std | Min | P25 | Median | P75 | Max |
|---|---|---|---|---|---|---|---|---|---|
| **Men** | | | | | | | | | |
| Days since Index Exam | 1944 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Age (years) at examination | 1944 | 0 | 49.79 | 8.72 | 33.00 | 42.00 | 49.00 | 57.00 | 69.00 |
| Body Mass Index (kg/(M*M) | 1939 | 5 | 26.17 | 3.41 | 15.54 | 23.97 | 26.08 | 28.32 | 40.38 |
| Systolic BP mmHg | 1944 | 0 | 131.74 | 19.44 | 83.50 | 118.00 | 129.00 | 141.50 | 235.00 |
| Diastolic BP mmHg | 1944 | 0 | 83.71 | 11.44 | 48.00 | 76.00 | 82.00 | 90.00 | 136.00 |
| Serum Cholesterol mg/dL | 1937 | 7 | 233.58 | 42.36 | 113.00 | 206.00 | 231.00 | 259.00 | 696.00 |
| HDL Cholesterol mg/dL | 0 | 1944 | . | . | . | . | . | . | . |
| LDL Cholesterol mg/dL | 0 | 1944 | . | . | . | . | . | . | . |
| Casual Glucose mg/dL | 1824 | 120 | 82.32 | 24.72 | 40.00 | 71.00 | 78.00 | 87.00 | 394.00 |
| Cigarettes per day | 1928 | 16 | 13.23 | 13.78 | 0.00 | 0.00 | 10.50 | 20.00 | 70.00 |
| Ventricular Rate (beats/min) | 1943 | 1 | 74.40 | 11.90 | 44.00 | 66.00 | 75.00 | 80.00 | 130.00 |
| **Women** | | | | | | | | | |
| Days since Index Exam | 2490 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Age (years) at examination | 2490 | 0 | 50.03 | 8.64 | 32.00 | 43.00 | 49.00 | 57.00 | 70.00 |
| Body Mass Index (kg/(M*M) | 2476 | 14 | 25.59 | 4.56 | 15.96 | 22.54 | 24.83 | 27.82 | 56.80 |
| Systolic BP mmHg | 2490 | 0 | 133.82 | 24.46 | 83.50 | 116.00 | 128.50 | 146.50 | 295.00 |
| Diastolic BP mmHg | 2490 | 0 | 82.60 | 12.50 | 50.00 | 74.00 | 81.00 | 89.00 | 142.50 |
| Serum Cholesterol mg/dL | 2445 | 45 | 239.68 | 46.22 | 107.00 | 206.00 | 237.00 | 269.00 | 600.00 |
| HDL Cholesterol mg/dL | 0 | 2490 | . | . | . | . | . | . | . |
| LDL Cholesterol mg/dL | 0 | 2490 | . | . | . | . | . | . | . |
| Casual Glucose mg/dL | 2213 | 277 | 82.07 | 24.14 | 40.00 | 72.00 | 78.00 | 86.00 | 394.00 |
| Cigarettes per day | 2474 | 16 | 5.65 | 8.96 | 0.00 | 0.00 | 0.00 | 10.00 | 50.00 |
| Ventricular Rate (beats/min) | 2490 | 0 | 77.06 | 12.15 | 46.00 | 69.00 | 75.00 | 85.00 | 143.00 |

Examination cycle 2

| | N | NMiss | Mean | Std | Min | P25 | Median | P75 | Max |
|---|---|---|---|---|---|---|---|---|---|
| **Men** | | | | | | | | | |
| Days since Index Exam | 1691 | 0 | 2173.67 | 72.44 | 1577.00 | 2142.00 | 2174.00 | 2205.00 | 2520.00 |
| Age (years) at examination | 1691 | 0 | 55.10 | 8.51 | 39.00 | 48.00 | 54.00 | 62.00 | 75.00 |
| Body Mass Index (kg/(M*M) | 1685 | 6 | 26.23 | 3.40 | 16.24 | 24.05 | 26.09 | 28.23 | 39.46 |
| Systolic BP mmHg | 1691 | 0 | 135.48 | 19.90 | 88.00 | 120.00 | 132.00 | 148.00 | 216.00 |
| Diastolic BP mmHg | 1691 | 0 | 84.61 | 10.91 | 53.00 | 78.00 | 84.00 | 91.00 | 124.00 |
| Serum Cholesterol mg/dL | 1666 | 25 | 241.82 | 42.14 | 115.00 | 214.00 | 240.00 | 266.00 | 614.00 |
| HDL Cholesterol mg/dL | 0 | 1691 | . | . | . | . | . | . | . |
| LDL Cholesterol mg/dL | 0 | 1691 | . | . | . | . | . | . | . |
| Casual Glucose mg/dL | 1518 | 173 | 82.24 | 23.31 | 40.00 | 70.00 | 77.00 | 88.00 | 362.00 |
| Cigarettes per day | 1682 | 9 | 12.23 | 15.04 | 0.00 | 0.00 | 2.00 | 20.00 | 90.00 |
| Ventricular Rate (beats/min) | 1691 | 0 | 75.92 | 12.66 | 42.00 | 68.00 | 75.00 | 83.00 | 130.00 |
| **Women** | | | | | | | | | |
| Days since Index Exam | 2239 | 0 | 2176.22 | 76.20 | 1633.00 | 2144.00 | 2175.00 | 2207.00 | 2765.00 |
| Age (years) at examination | 2239 | 0 | 55.66 | 8.56 | 39.00 | 48.00 | 55.00 | 62.00 | 76.00 |
| Body Mass Index (kg/(M*M) | 2229 | 10 | 25.65 | 4.58 | 15.33 | 22.54 | 24.88 | 27.85 | 56.80 |
| Systolic BP mmHg | 2239 | 0 | 138.06 | 24.30 | 88.00 | 121.00 | 134.00 | 151.00 | 282.00 |
| Diastolic BP mmHg | 2239 | 0 | 83.57 | 11.79 | 47.00 | 76.00 | 82.00 | 90.00 | 150.00 |
| Serum Cholesterol mg/dL | 2121 | 118 | 255.67 | 47.53 | 122.00 | 223.00 | 252.00 | 285.00 | 638.00 |
| HDL Cholesterol mg/dL | 0 | 2239 | . | . | . | . | . | . | . |
| LDL Cholesterol mg/dL | 0 | 2239 | . | . | . | . | . | . | . |
| Casual Glucose mg/dL | 1931 | 308 | 81.76 | 21.32 | 39.00 | 71.00 | 78.00 | 87.00 | 420.00 |
| Cigarettes per day | 2215 | 24 | 5.97 | 10.00 | 0.00 | 0.00 | 0.00 | 10.00 | 60.00 |
| Ventricular Rate (beats/min) | 2238 | 1 | 78.36 | 12.76 | 45.00 | 70.00 | 75.00 | 85.00 | 220.00 |

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 Means selected Risk factors     N   NMiss    Mean     Std     Min     P25  Median     P75     Max
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Examination cycle 3
Men
 Days since Index Exam           1387      0 4353.75   97.74 3748.00 4312.00 4361.00 4403.00 4816.00
 Age (years) at examination      1387      0   60.35    8.19   45.00   53.00   60.00   67.00   80.00
 Body Mass Index (kg/(M*M)       1380      7   26.22    3.49   14.43   24.02   26.09   28.25   45.43
 Systolic BP mmHg                1387      0  139.26   21.15   91.00  123.00  136.00  152.00  225.00
 Diastolic BP mmHg               1387      0   82.55   11.29   30.00   75.00   81.50   90.00  123.00
 Serum Cholesterol mg/dL         1312     75  225.74   41.13  130.00  198.00  222.00  252.00  413.00
 HDL Cholesterol mg/dL           1304     83   43.71   13.30   10.00   35.00   42.00   51.00  138.00
 LDL Cholesterol mg/dL           1304     83  170.55   44.66   34.00  140.00  167.50  199.00  376.00
 Casual Glucose mg/dL            1163    224   91.17   28.99   49.00   77.00   85.00   97.00  423.00
 Cigarettes per day              1380      7    8.70   13.51    0.00    0.00    0.00   20.00   80.00
 Ventricular Rate (beats/min)    1387      0   75.88   12.73   43.00   66.00   75.00   85.00  150.00
Women
 Days since Index Exam           1876      0 4353.61   93.13 3919.00 4313.00 4362.00 4402.50 4854.00
 Age (years) at examination      1876      0   60.87    8.37   44.00   54.00   60.00   67.00   81.00
 Body Mass Index (kg/(M*M)       1866     10   25.65    4.45   14.53   22.59   24.80   27.94   56.80
 Systolic BP mmHg                1876      0  140.92   24.14   86.00  123.00  138.00  156.00  267.00
 Diastolic BP mmHg               1876      0   81.23   11.23   46.00   73.00   80.00   88.00  130.00
 Serum Cholesterol mg/dL         1737    139  245.00   45.08  112.00  214.00  242.00  270.00  625.00
 HDL Cholesterol mg/dL           1723    153   53.64   15.90   11.00   43.00   52.00   62.00  189.00
 LDL Cholesterol mg/dL           1722    154  180.95   48.00   20.00  149.00  177.00  208.00  565.00
 Casual Glucose mg/dL            1538    338   88.72   27.48   46.00   76.00   84.00   95.00  478.00
 Cigarettes per day              1869      7    5.35    9.78    0.00    0.00    0.00    8.00   60.00
 Ventricular Rate (beats/min)    1872      4   78.45   12.20   37.00   70.00   77.00   85.00  130.00
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```

|  | Examination cycle | | | | | | | | | | | |
|  | 1 | | | | 2 | | | | 3 | | | |
|  | Men | | Women | | Men | | Women | | Men | | Women | |
|  | N | Percent | N | Percent | N | Percent | N | Percent | N | Percent | N | Percent |
| Total | 1944 | 100.00 | 2490 | 100.00 | 1691 | 100.00 | 2239 | 100.00 | 1387 | 100.00 | 1876 | 100.00 |
| Current Cig Smoker Y/N | | | | | | | | | | | | |
| No | 769 | 39.56 | 1484 | 59.60 | 811 | 47.96 | 1392 | 62.17 | 848 | 61.14 | 1294 | 68.98 |
| Yes | 1175 | 60.44 | 1006 | 40.40 | 880 | 52.04 | 847 | 37.83 | 539 | 38.86 | 582 | 31.02 |
| Diabetic Y/N | | | | | | | | | | | | |
| No | 1885 | 96.97 | 2428 | 97.51 | 1617 | 95.62 | 2158 | 96.38 | 1267 | 91.35 | 1742 | 92.86 |
| Yes | 59 | 3.03 | 62 | 2.49 | 74 | 4.38 | 81 | 3.62 | 120 | 8.65 | 134 | 7.14 |
| Anti-hypertensive meds Y/N | | | | | | | | | | | | |
| Missing | 22 | 1.13 | 39 | 1.57 | 37 | 2.19 | 49 | 2.19 | 189 | 13.63 | 257 | 13.70 |
| No | 1880 | 96.71 | 2349 | 94.34 | 1553 | 91.84 | 1920 | 85.75 | 1060 | 76.42 | 1328 | 70.79 |
| Yes | 42 | 2.16 | 102 | 4.10 | 101 | 5.97 | 270 | 12.06 | 138 | 9.95 | 291 | 15.51 |
| Prevalent CHD (MI,AP,CI) | | | | | | | | | | | | |
| No | 1820 | 93.62 | 2420 | 97.19 | 1516 | 89.65 | 2126 | 94.95 | 1187 | 85.58 | 1716 | 91.47 |
| Yes | 124 | 6.38 | 70 | 2.81 | 175 | 10.35 | 113 | 5.05 | 200 | 14.42 | 160 | 8.53 |
| Prevalent MI (Hosp,Silent) | | | | | | | | | | | | |
| No | 1874 | 96.40 | 2474 | 99.36 | 1588 | 93.91 | 2212 | 98.79 | 1272 | 91.71 | 1833 | 97.71 |
| Yes | 70 | 3.60 | 16 | 0.64 | 103 | 6.09 | 27 | 1.21 | 115 | 8.29 | 43 | 2.29 |
| Prevalent Angina | | | | | | | | | | | | |
| No | 1852 | 95.27 | 2435 | 97.79 | 1564 | 92.49 | 2146 | 95.85 | 1254 | 90.41 | 1749 | 93.23 |
| Yes | 92 | 4.73 | 55 | 2.21 | 127 | 7.51 | 93 | 4.15 | 133 | 9.59 | 127 | 6.77 |
| Prevalent Stroke (Infarct,Hem) | | | | | | | | | | | | |
| No | 1930 | 99.28 | 2472 | 99.28 | 1675 | 99.05 | 2204 | 98.44 | 1357 | 97.84 | 1837 | 97.92 |
| Yes | 14 | 0.72 | 18 | 0.72 | 16 | 0.95 | 35 | 1.56 | 30 | 2.16 | 39 | 2.08 |
| Prevalent Hypertension | | | | | | | | | | | | |
| No | 1313 | 67.54 | 1691 | 67.91 | 841 | 49.73 | 1130 | 50.47 | 542 | 39.08 | 766 | 40.83 |
| Yes | 631 | 32.46 | 799 | 32.09 | 850 | 50.27 | 1109 | 49.53 | 845 | 60.92 | 1110 | 59.17 |

Event Counts by sex

| Counts of Endpoints by Sex | SEX | | | |
| --- | --- | --- | --- | --- |
| | Men | | Women | |
| | N | Percent | N | Percent |
| All | 1944 | 100.00 | 2490 | 100.00 |
| Incident Hypertension | | | | |
| No | 540 | 27.78 | 642 | 25.78 |
| Yes | 1404 | 72.22 | 1848 | 74.22 |
| Incident Angina Pectoris | | | | |
| No | 1561 | 80.30 | 2148 | 86.27 |
| Yes | 383 | 19.70 | 342 | 13.73 |
| Incident Hospitalized MI | | | | |
| No | 1624 | 83.54 | 2356 | 94.62 |
| Yes | 320 | 16.46 | 134 | 5.38 |
| Incident Hosp MI-Fatal CHD | | | | |
| No | 1453 | 74.74 | 2250 | 90.36 |
| Yes | 491 | 25.26 | 240 | 9.64 |
| Incident Stroke Fatal/non-fatal | | | | |
| No | 1751 | 90.07 | 2268 | 91.08 |
| Yes | 193 | 9.93 | 222 | 8.92 |
| Incident Hosp MI, AP, CI, Fatal CHD | | | | |
| No | 1234 | 63.48 | 1960 | 78.71 |
| Yes | 710 | 36.52 | 530 | 21.29 |
| Incident Hosp MI or Stroke, Fatal or Non | | | | |
| No | 1258 | 64.71 | 2019 | 81.08 |
| Yes | 686 | 35.29 | 471 | 18.92 |
| Death indicator | | | | |
| No | 1101 | 56.64 | 1783 | 71.61 |
| Yes | 843 | 43.36 | 707 | 28.39 |

Distributions of Time to Event by sex

| Time to Event | | N | NMiss | Mean | Std | Min | P25 | Median | P75 | Max |
|---|---|---|---|---|---|---|---|---|---|---|
| Men | Days Baseline-Inc Hypertension | 1944 | 0 | 3313 | 3391 | 0 | 0 | 2156 | 6491 | 8766 |
| | Days Baseline-Inc Angina | 1944 | 0 | 6507 | 2929 | 0 | 4572 | 8486 | 8766 | 8766 |
| | Days Baseline-Inc Hosp MI | 1944 | 0 | 6736 | 2771 | 0 | 5006 | 8766 | 8766 | 8766 |
| | Days Baseline-Inc MI-Fatal CHD | 1944 | 0 | 6655 | 2816 | 0 | 4822 | 8743 | 8766 | 8766 |
| | Days Baseline-Inc Stroke | 1944 | 0 | 7003 | 2509 | 0 | 5608 | 8766 | 8766 | 8766 |
| | Days Baseline-Inc Any CHD | 1944 | 0 | 6156 | 3067 | 0 | 3853 | 7653 | 8766 | 8766 |
| | Days Baseline-Inc CVD | 1944 | 0 | 6274 | 3015 | 0 | 4009 | 7895 | 8766 | 8766 |
| | Days Baseline-Death | 1944 | 0 | 7194 | 2386 | 26 | 6047 | 8766 | 8766 | 8766 |
| Women | Days Baseline-Inc Hypertension | 2490 | 0 | 3532 | 3496 | 0 | 0 | 2219 | 7340 | 8766 |
| | Days Baseline-Inc Angina | 2490 | 0 | 7209 | 2559 | 0 | 6132 | 8766 | 8766 | 8766 |
| | Days Baseline-Inc Hosp MI | 2490 | 0 | 7634 | 2154 | 0 | 7541 | 8766 | 8766 | 8766 |
| | Days Baseline-Inc MI-Fatal CHD | 2490 | 0 | 7600 | 2197 | 0 | 7452 | 8766 | 8766 | 8766 |
| | Days Baseline-Inc Stroke | 2490 | 0 | 7540 | 2262 | 0 | 7283 | 8766 | 8766 | 8766 |
| | Days Baseline-Inc Any CHD | 2490 | 0 | 7065 | 2656 | 0 | 5618 | 8766 | 8766 | 8766 |
| | Days Baseline-Inc CVD | 2490 | 0 | 7243 | 2549 | 0 | 6241 | 8766 | 8766 | 8766 |
| | Days Baseline-Death | 2490 | 0 | 7749 | 2037 | 34 | 8016 | 8766 | 8766 | 8766 |

Age Specific Angina and Hospitalized MI-Fatal CHD Incidence Rates by Sex

| | | Angina | | | | Hospitalized MI - Fatal CHD | | |
|---|---|---|---|---|---|---|---|---|
| | N* | Person Years | Events | Rate/ 1,000PY | N* | Person Years | Events | Rate/ 1,000PY |
| Men | | | | | | | | |
| 35-44 | 649 | 3,053 | 12 | 3.9 | 644 | 3,037 | 8 | 2.6 |
| 45-54 | 1,278 | 9,587 | 52 | 5.4 | 1,269 | 9,498 | 67 | 7.1 |
| 55-64 | 1,646 | 12,241 | 135 | 11.0 | 1,629 | 12,274 | 154 | 12.5 |
| 65-74 | 1,115 | 7,488 | 78 | 10.4 | 1,125 | 7,623 | 117 | 15.3 |
| 75-84 | 416 | 2,165 | 13 | 6.0 | 432 | 2,210 | 43 | 19.5 |
| 85+ | 52 | 93 | 1 | 10.8 | 54 | 97 | 6 | 62.0 |
| Women | | | | | | | | |
| 35-44 | 783 | 3,765 | 3 | 0.8 | 783 | 3,769 | 2 | 0.5 |
| 45-54 | 1,634 | 12,316 | 26 | 2.1 | 1,631 | 12,400 | 12 | 1.0 |
| 55-64 | 2,229 | 17,261 | 123 | 7.1 | 2,238 | 17,675 | 60 | 3.4 |
| 65-74 | 1,640 | 11,679 | 98 | 8.4 | 1,705 | 12,421 | 78 | 6.3 |
| 75-84 | 707 | 3,815 | 35 | 9.2 | 769 | 4,262 | 55 | 12.9 |
| 85+ | 106 | 287 | 2 | 7.0 | 121 | 316 | 7 | 22.1 |

N* - Number of persons contributing person years to that age group. Incidence rates are calculated using derived age at time of event.


Age Specific Stroke and Cardiovascular Disease (Fatal and Non-Fatal) Incidence Rates by Sex

| | | Stroke | | | | Cardiovascular Disease (CVD) | | |
|---|---|---|---|---|---|---|---|---|
| | N* | Person Years | Events | Rate/ 1,000PY | N* | Person Years | Events | Rate/ 1,000PY |
| Men | | | | | | | | |
| 35-44 | 655 | 3,082 | 1 | 0.3 | 643 | 3,010 | 13 | 4.3 |
| 45-54 | 1,313 | 9,921 | 14 | 1.4 | 1,260 | 9,353 | 95 | 10.2 |
| 55-64 | 1,743 | 13,293 | 42 | 3.2 | 1,588 | 11,769 | 202 | 17.2 |
| 65-74 | 1,256 | 8,471 | 74 | 8.7 | 1,058 | 6,920 | 185 | 26.7 |
| 75-84 | 477 | 2,402 | 44 | 18.3 | 378 | 1,839 | 75 | 40.8 |
| 85+ | 50 | 97 | 4 | 41.1 | 41 | 65 | 9 | 138.0 |
| Women | | | | | | | | |
| 35-44 | 782 | 3,761 | 2 | 0.5 | 781 | 3,759 | 5 | 1.3 |
| 45-54 | 1,638 | 12,420 | 10 | 0.8 | 1,621 | 12,282 | 31 | 2.5 |
| 55-64 | 2,283 | 17,932 | 47 | 2.6 | 2,209 | 17,180 | 133 | 7.7 |
| 65-74 | 1,760 | 12,713 | 83 | 6.5 | 1,631 | 11,588 | 148 | 12.8 |
| 75-84 | 774 | 4,230 | 52 | 12.3 | 695 | 3,737 | 85 | 22.7 |
| 85+ | 124 | 322 | 10 | 31.0 | 103 | 264 | 15 | 56.8 |

N* - Number of persons contributing person years to that age group. Incidence rates are calculated using derived age at time of event.
For CVD endpoint, population at risk defined by PREVCHD=0 AND PREVSTRK=0