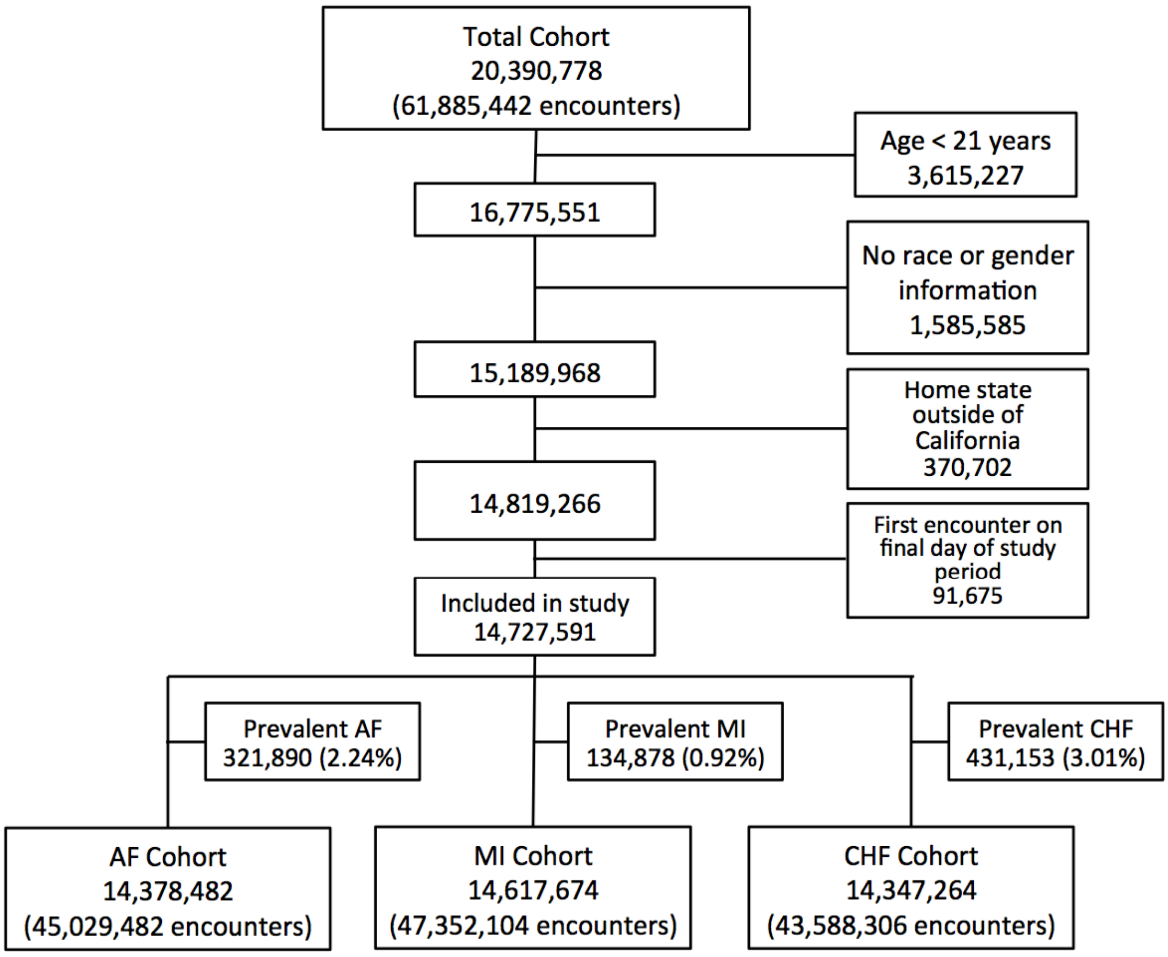
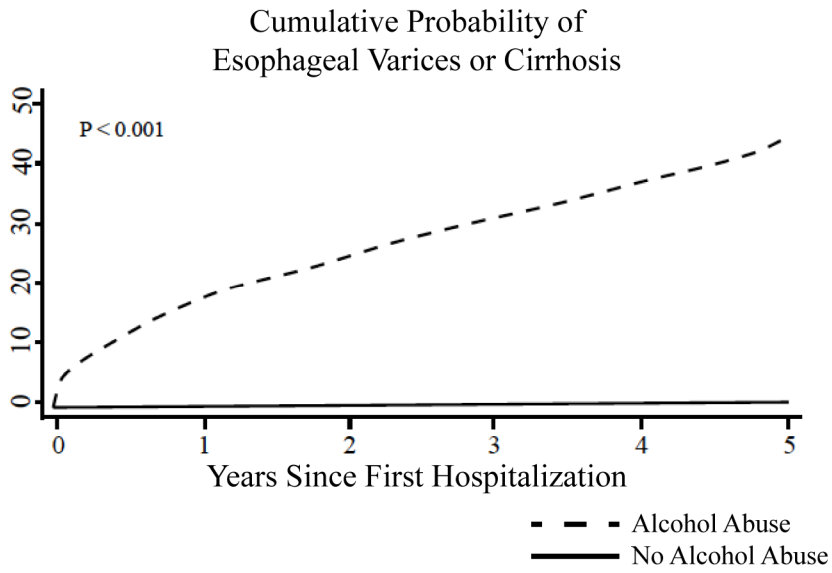
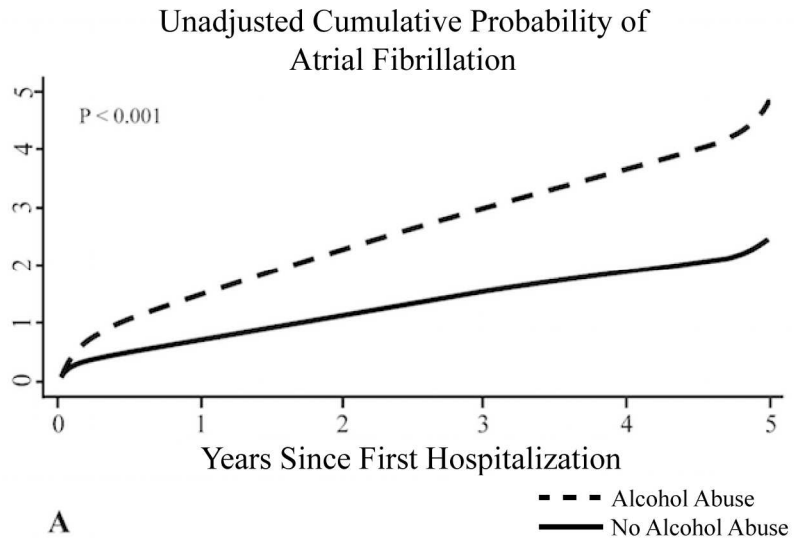
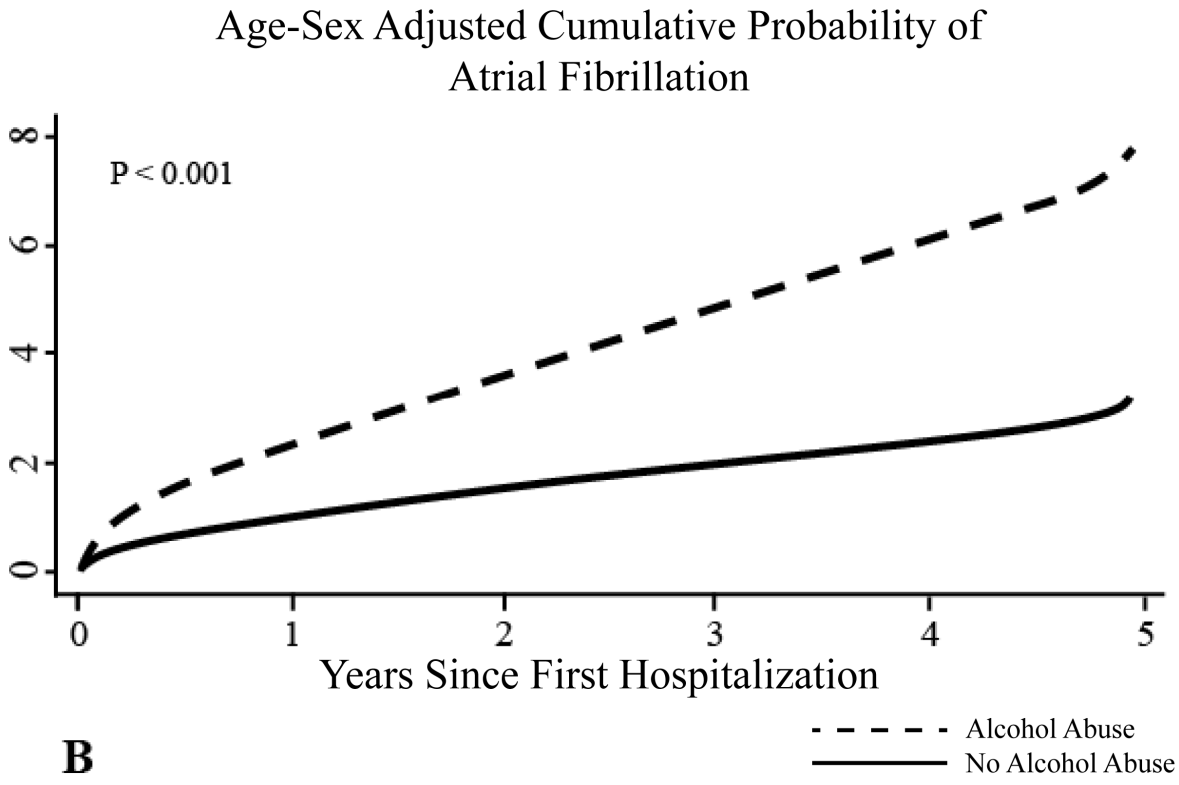

Total Cohort
20,390,778
(61,885,442 encounters)
Age < 21 years
3,615,227
16,775,551
No race or gender information
1,585,585
15,189,968
Home state outside of California
370,702
14,819,266
First encounter on final day of study period
91,675
Included in study
14,727,591
Prevalent AF
321,890 (2.24%)
Prevalent MI
134,878 (0.92%)
Prevalent CHF
431,153 (3.01%)
AF Cohort
14,378,482
(45,029,482 encounters)
MI Cohort
14,617,674
(47,352,104 encounters)
CHF Cohort
14,347,264
(43,588,306 encounters)

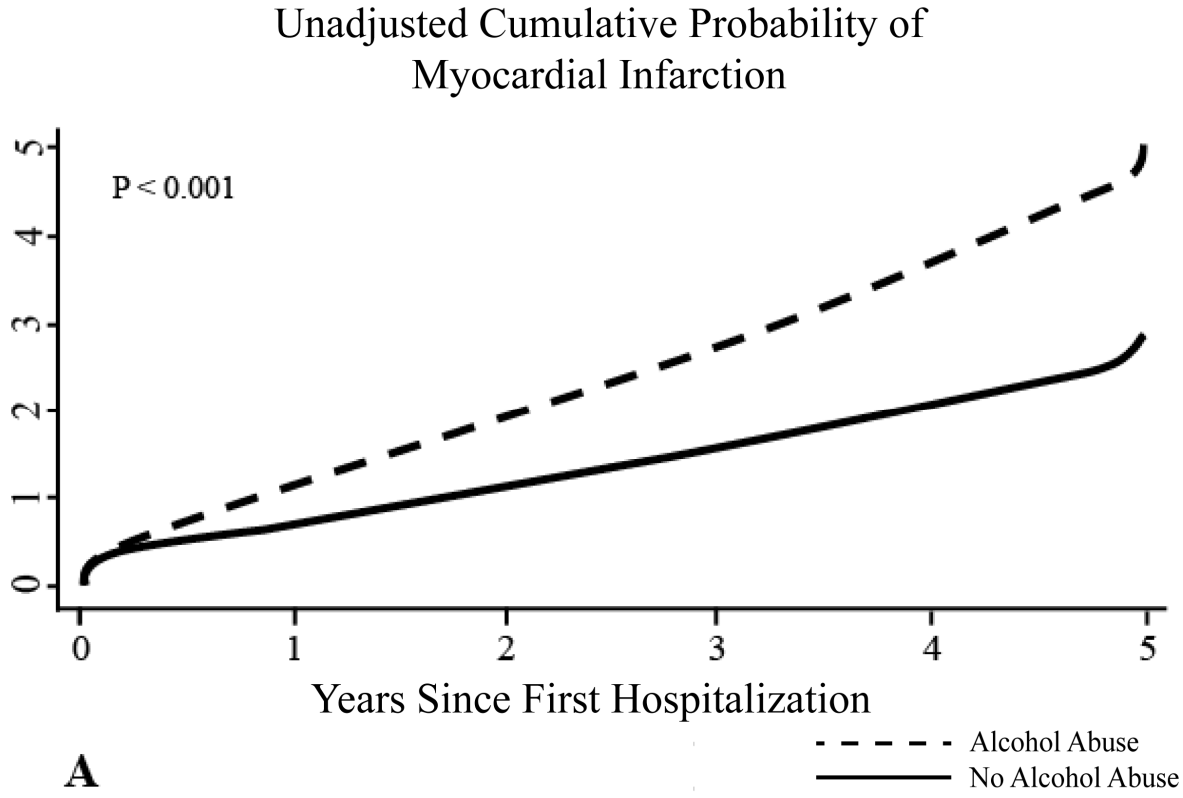

Cumulative Probability of
Esophageal Varices or Cirrhosis
P < 0.001
0
10
20
30
40
50
0
1
2
3
4
5
Years Since First Hospitalization
Alcohol Abuse
No Alcohol Abuse

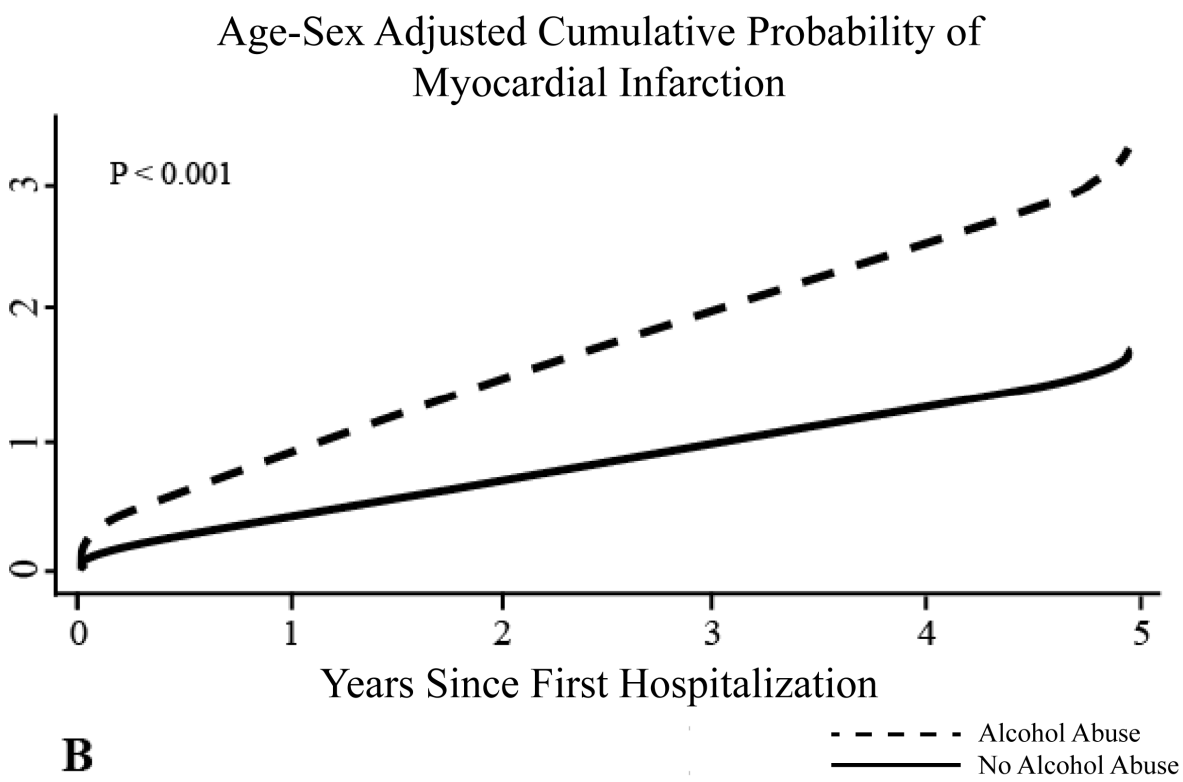

Unadjusted Cumulative Probability of
Atrial Fibrillation
P < 0.001
0
1
2
3
4
5
Years Since First Hospitalization
Alcohol Abuse
No Alcohol Abuse

A

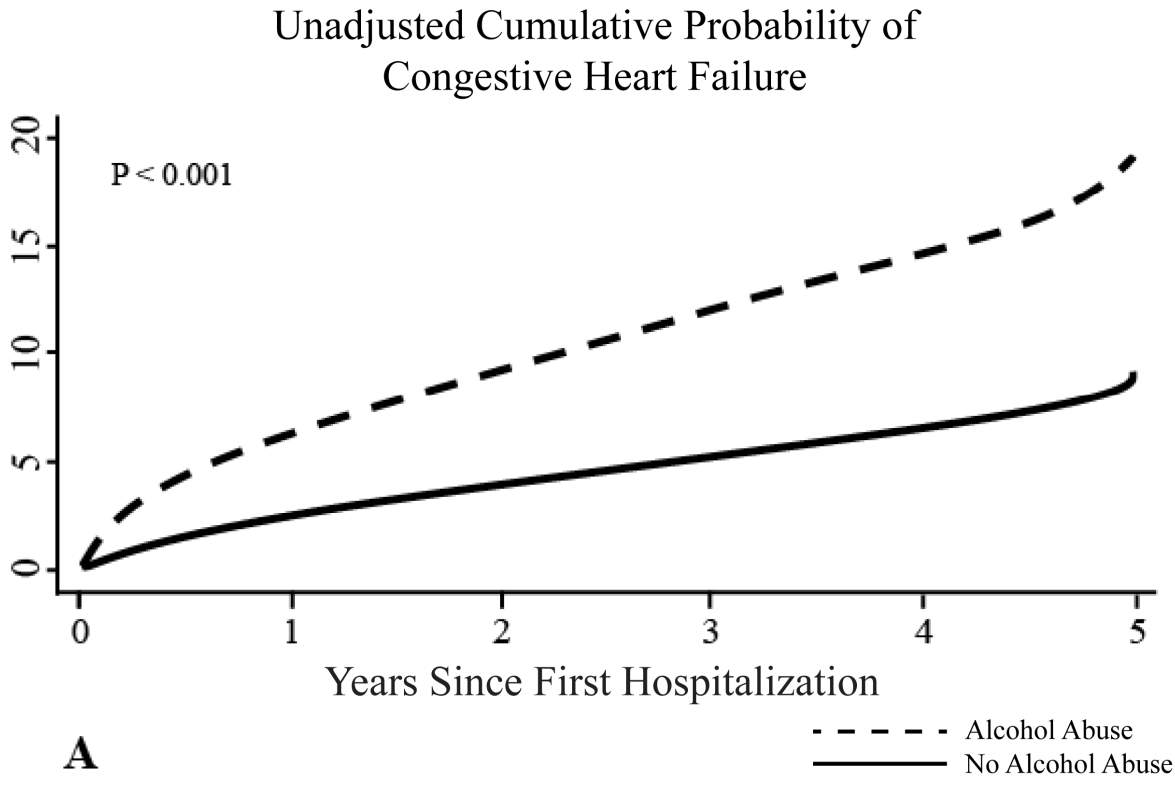

Age-Sex Adjusted Cumulative Probability of
Atrial Fibrillation
P < 0.001
0
2
4
6
8
0
1
2
3
4
5
Years Since First Hospitalization
Alcohol Abuse
No Alcohol Abuse

B

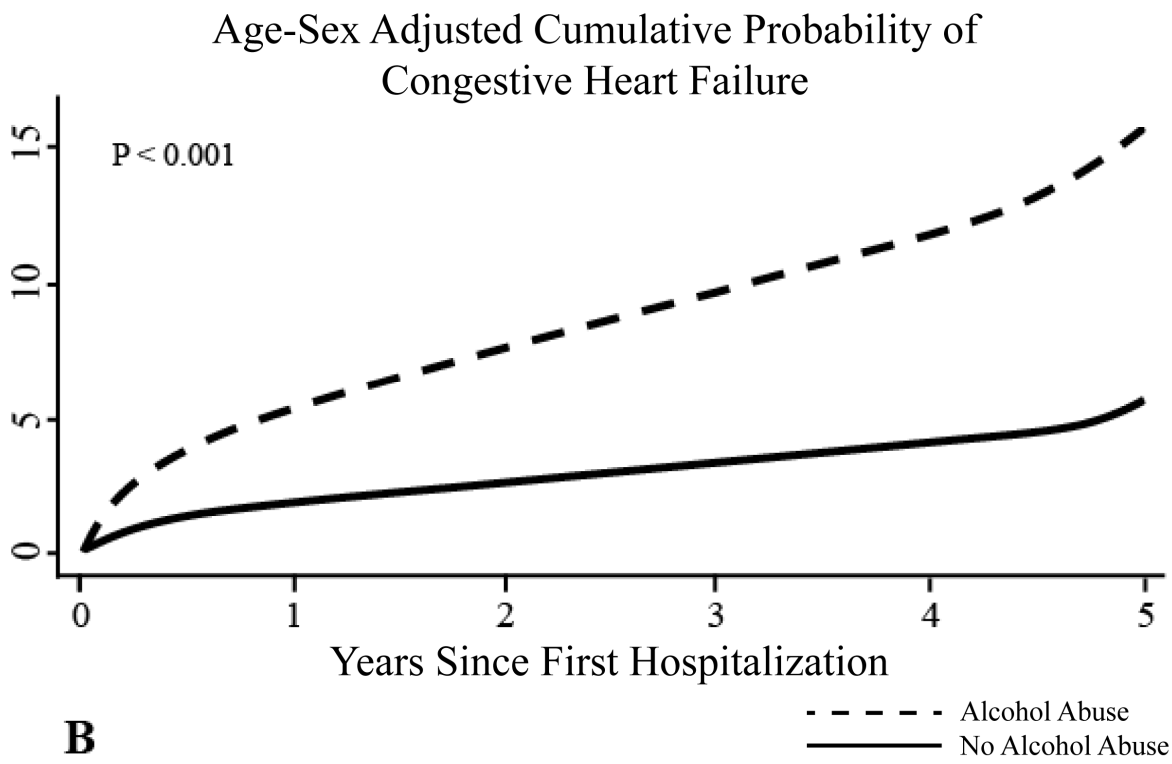

Unadjusted Cumulative Probability of
Myocardial Infarction
P < 0.001
0
1
2
3
4
5
Years Since First Hospitalization
Alcohol Abuse
No Alcohol Abuse
A


Age-Sex Adjusted Cumulative Probability of
Myocardial Infarction
P < 0.001
0
1
2
3
0
1
2
3
4
5
Years Since First Hospitalization
Alcohol Abuse
No Alcohol Abuse

B


Unadjusted Cumulative Probability of
Congestive Heart Failure
P < 0.001
0
5
10
15
20
0
1
2
3
4
5
Years Since First Hospitalization
Alcohol Abuse
No Alcohol Abuse

A


Age-Sex Adjusted Cumulative Probability of
Congestive Heart Failure
P < 0.001
15
10
5
0
0
1
2
3
4
5
Years Since First Hospitalization
Alcohol Abuse
No Alcohol Abuse

B

Appendix

Appendix Figure Legends

Appendix Figure 1: Patients in the California Healthcare Cost and Utilization Project between January 1, 2005 and December 31, 2009 and Included in the Analysis.

AF, atrial fibrillation; CHF, congestive heart failure; MI, myocardial infarction.

Appendix Figure 2: Cumulative Probability of Esophageal Varices or Cirrhosis by Presence or Absence of Alcohol Abuse.

These curves were generated under a proportional hazards assumption. Model is adjusted for age, sex, race, hypertension, diabetes, coronary artery disease, congestive heart failure, chronic kidney disease, valvular heart disease, dyslipidemia, obesity, obstructive sleep apnea, cigarette smoking, and income.

Appendix Figure 3: (A) Unadjusted and (B) Age and Sex Adjusted Incidence of Atrial Fibrillation by Presence or Absence of Alcohol Abuse.

These curves were generated under a proportional hazards assumption. Age by decade was used in adjustment.

Appendix Figure 4: (A) Unadjusted and (B) Age and Sex Adjusted Incidence of Myocardial Infarction by Presence or Absence of Alcohol Abuse.

These curves were generated under a proportional hazards assumption. Age by decade was used in adjustment.

Appendix Figure 5: (A) Unadjusted and (B) Age and Sex Adjusted Incidence of Congestive Heart Failure by Presence or Absence of Alcohol Abuse.

These curves were generated under a proportional hazards assumption. Age by decade was used in adjustment.

Appendix Table 1: International Classification of Diseases-9th Edition (ICD-9) and Current Procedural Terminology (CPT) Codes Used for Disease Identification

Diagnosis		ICD-9/CPT Code*
Alcohol abuse	ICD-9	291.0, 291.1, 291.3, 291.4, 291.81, 303, 303.0, 303.00, 303.01, 303.02, 303.03, 303.9, 303.90, 303.91, 303.92, 303.93, 305.0
Myocardial infarction	ICD-9	410.X
Congestive heart failure, systolic or mixed	ICD-9	402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 425.1, 425.4, 425.5, 425.7, 425.8, 425.9, 428.0, 428, 428.1, 428.2, 428.4, 428.40, 428.9
Congestive heart failure, diastolic only	ICD-9	428.3, 428.30
Atrial fibrillation	ICD-9	427.3, 427.31
Hypertension	ICD-9	437.2, 401.X, 402.X, 403.X, 404.X, 405.X
Diabetes mellitus	ICD-9	249.X, 250.X, 790.X, 791.5, 791.6, V458.5, V539.1, V654.6
Coronary artery disease	ICD-9	36.01, 36.02, 36.03, 36.05, 36.09, 36.1X, 411.0, 411.1, 411.8, 411.89, 412, 413.X, 414.X, 429.7, V458.2
Chronic kidney disease	ICD-9 CPT	39.93, 54.98, 585.X, V420, V451, V451.1, V451.2, V560, V561, V562, V563.1, V563.2, V568, V56 90921, 90925, 90935, 90937, 90945, 90947, 90989, 90993
Valvular heart disease	ICD-9	394.X, 395.X, 396.X, 397.0, 397.1, 424.0, 424.1, 424.2, 424.3, V422, V433
Dyslipidemia	ICD-9	272, 272.X
Active smoking	ICD-9	305.1
Cardiac Surgery	ICD-9	35.3X, 35.4X, 35.5X, 35.6X, 35.7X, 36.1X, 37.1X, 37.2X, 37.3X, 37.40
Cirrhosis	ICD-9	571, 571.0, 571.1, 571.2, 571.3, 571.5, 571.6, 571.8, 571.9
Esophageal varices	ICD-9 CPT	456.0, 456.1, 456.2, 456.20, 456.21 43204, 43205, 43243, 43244

*X delineates a possibility of any of multiple integers (0-9) representing more specific descriptions still falling within the listed diagnosis term.

Appendix Table 2: Incidence of Atrial Fibrillation, Myocardial Infarction, and Congestive Heart Failure by Patient Subgroups

	Atrial Fibrillation‡ n = 14 378 483	Myocardial Infarction n = 14 286 472	Congestive Heart Failure n = 14 043 590
Overall	7.4 (7.4-7.4)	3.1 (3.0-3.1)	10.0 (10.0-10.0)
Male	8.9 (8.7-8.9)	3.8 (3.8-3.8)	11.3 (11.2-11.3)
Female	6.4 (6.3-6.4)	2.5 (2.5-2.5)	9.1 (9.0-9.1)
Age			
≥ 60 yr.	21.3 (21.1-21.4)	7.6 (7.6-7.7)	26.6 (26.5-26.7)
< 60 yr.	1.2 (1.2-1.2)	0.9 (0.9-0.9)	2.6 (2.5-2.6)
Race			
White	9.1 (9.1-9.2)	3.2 (3.1-3.2)	10.5 (10.4-10.5)
Black	5.3 (5.2-5.3)	3.2 (3.1-3.3)	12.0 (11.9-12.1)
Hispanic	4.4 (4.3-4.4)	2.4 (2.4-2.4)	7.8 (7.8-7.9)
Asian/Pacific Islander	6.7 (6.6-6.7)	3.2 (3.1-3.2)	9.3 (9.2-9.4)
Native American	8.4 (7.9-8.9)	4.4 (4.1-4.8)	14.6 (14.0-15.3)
Other	8.6 (8.5-8.7)	4.5 (4.4-4.6)	13.2 (13.1-13.4)

Incidence rates are events per 1,000 person-years (95% confidence interval)

Appendix Table 3: Association between Alcohol Abuse and Incident Esophageal Varices or Cirrhosis.

	Hazard Ratio	95% CI	P-value
Unadjusted			
Alcohol Abuse	191.6	188.4-194.8	<0.0001
Adjusted			
Alcohol Abuse	132.6	130.7-134.4	<0.0001

CI, confidence interval

Model is adjusted for age, sex, race, hypertension, diabetes, coronary artery disease, congestive heart failure, chronic kidney disease, valvular heart disease, dyslipidemia, obesity, obstructive sleep apnea, cigarette smoking, and income.

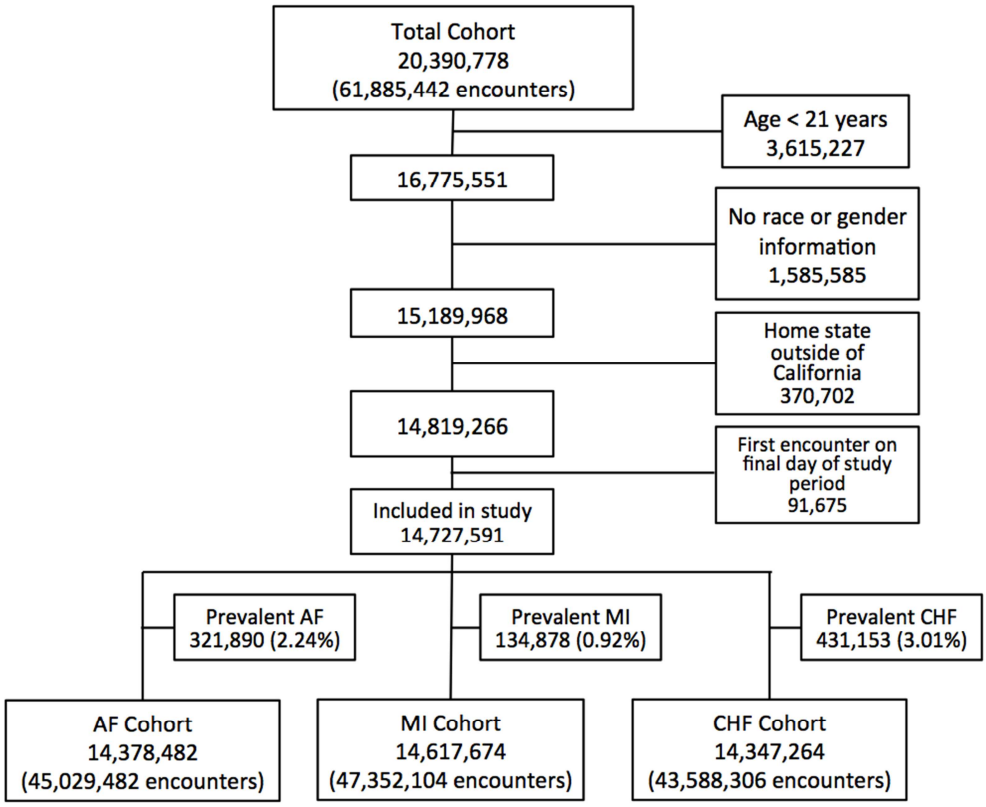
Table 4: Risk of Atrial Fibrillation, Myocardial Infarction, and Congestive Heart Failure with Alcohol Abuse.

	Atrial Fibrillation		Myocardial Infarction		Congestive Heart Failure	
Risk with Alcohol Abuse	HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
Unadjusted	2.1 (1.9-2.3)	<0.0001	2.0 (1.8-1.3)	<0.0001	2.4 (2.2-2.6)	<0.0001
Adjusted*	2.2 (2.0-2.4)	<0.0001	1.4 (1.3-1.6)	<0.0001	2.4 (2.2-2.5)	<0.0001

CI, confidence interval; HR, hazard ratio

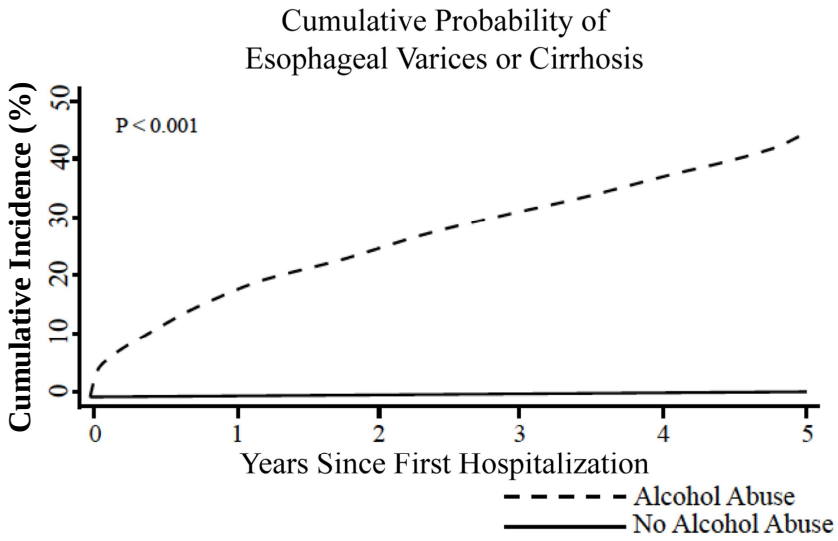
* Each model is adjusted for age, sex, race, hypertension, diabetes, coronary artery disease (for the AF and CHF outcomes), congestive heart failure (for the AF and MI outcomes), chronic kidney disease, valvular heart disease (for the AF and CHF outcomes), dyslipidemia, obesity, obstructive sleep apnea, cigarette smoking, and income.

Appendix Figure 1: Patients in the California Healthcare Cost and Utilization Project between January 1, 2005 and December 31, 2009 and Included in the Analysis.



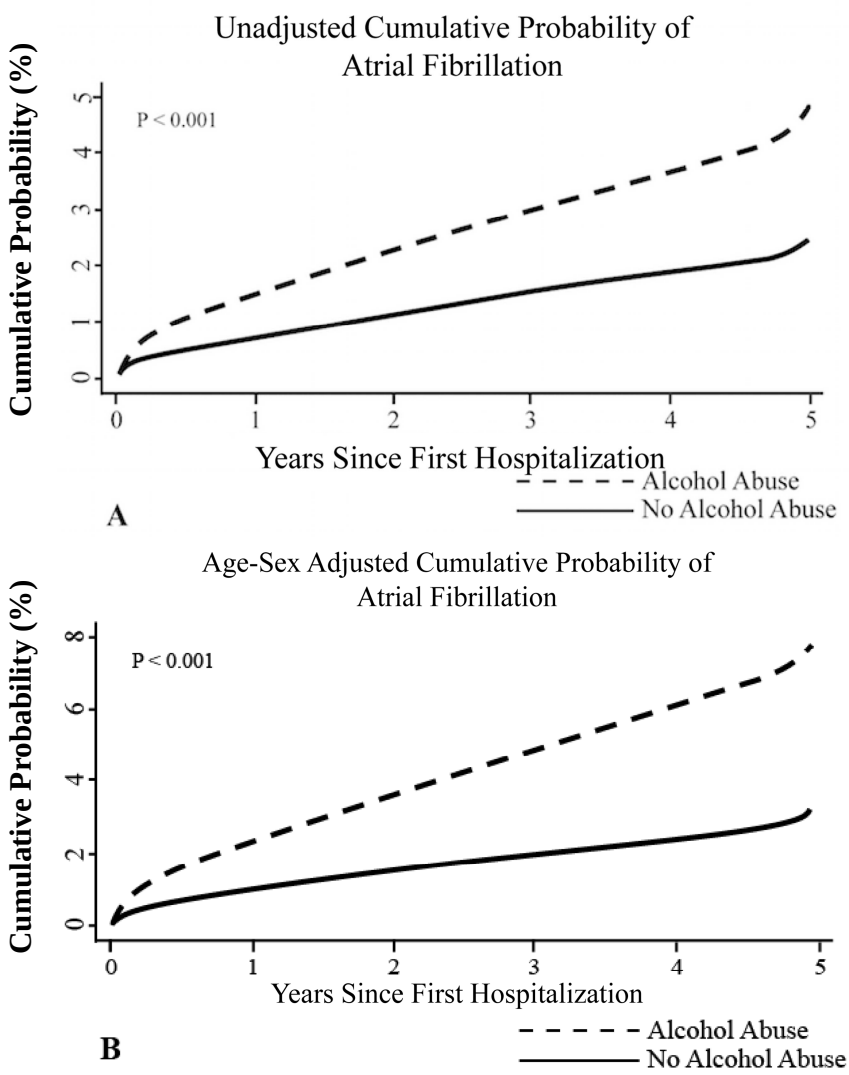
AF, atrial fibrillation; CHF, congestive heart failure; MI, myocardial infarction.

Appendix Figure 2: Cumulative Probability of Esophageal Varices or Cirrhosis by Presence or Absence of Alcohol Abuse



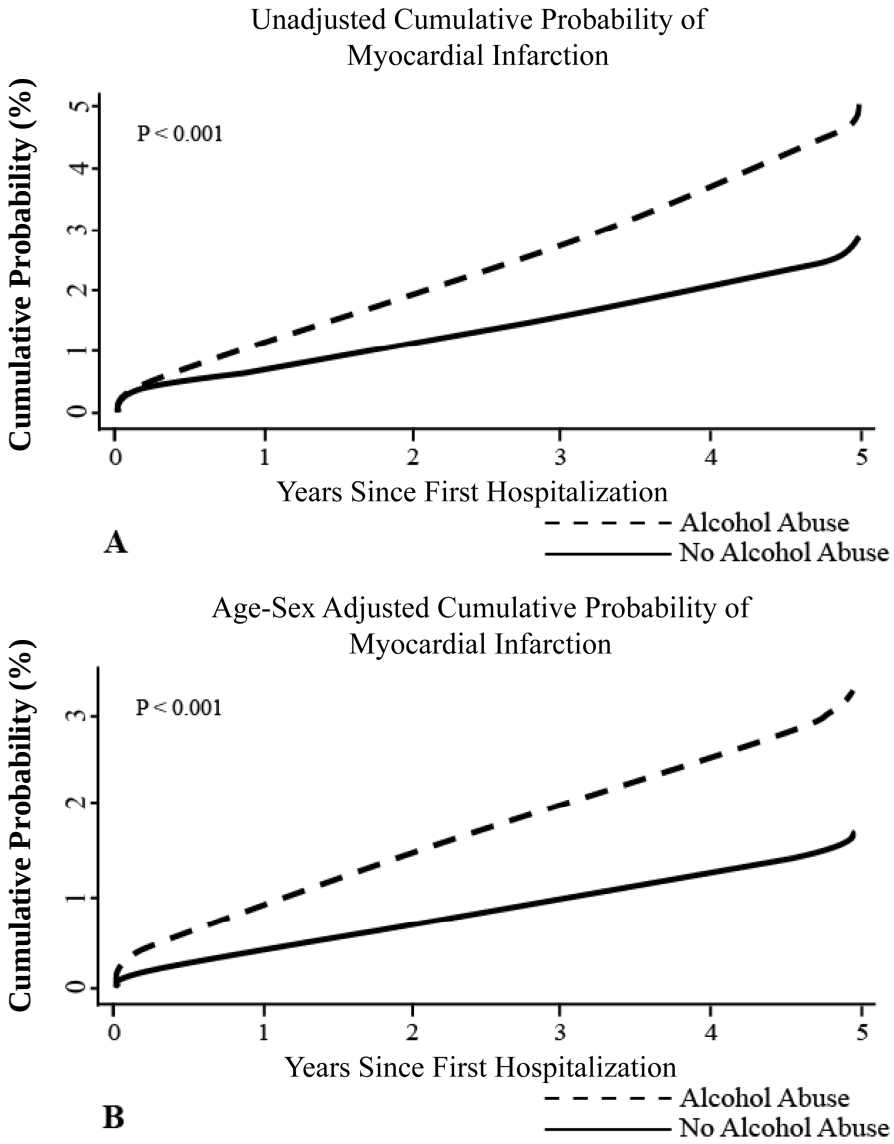
These curves were generated under a proportional hazards assumption. Model is adjusted for age, sex, race, hypertension, diabetes, coronary artery disease, congestive heart failure, chronic kidney disease, valvular heart disease, dyslipidemia, obesity, obstructive sleep apnea, cigarette smoking, and income.

Appendix Figure 3: (A) Unadjusted and (B) Age and Sex Adjusted Cumulative Probability of Atrial Fibrillation by Presence or Absence of Alcohol Abuse.



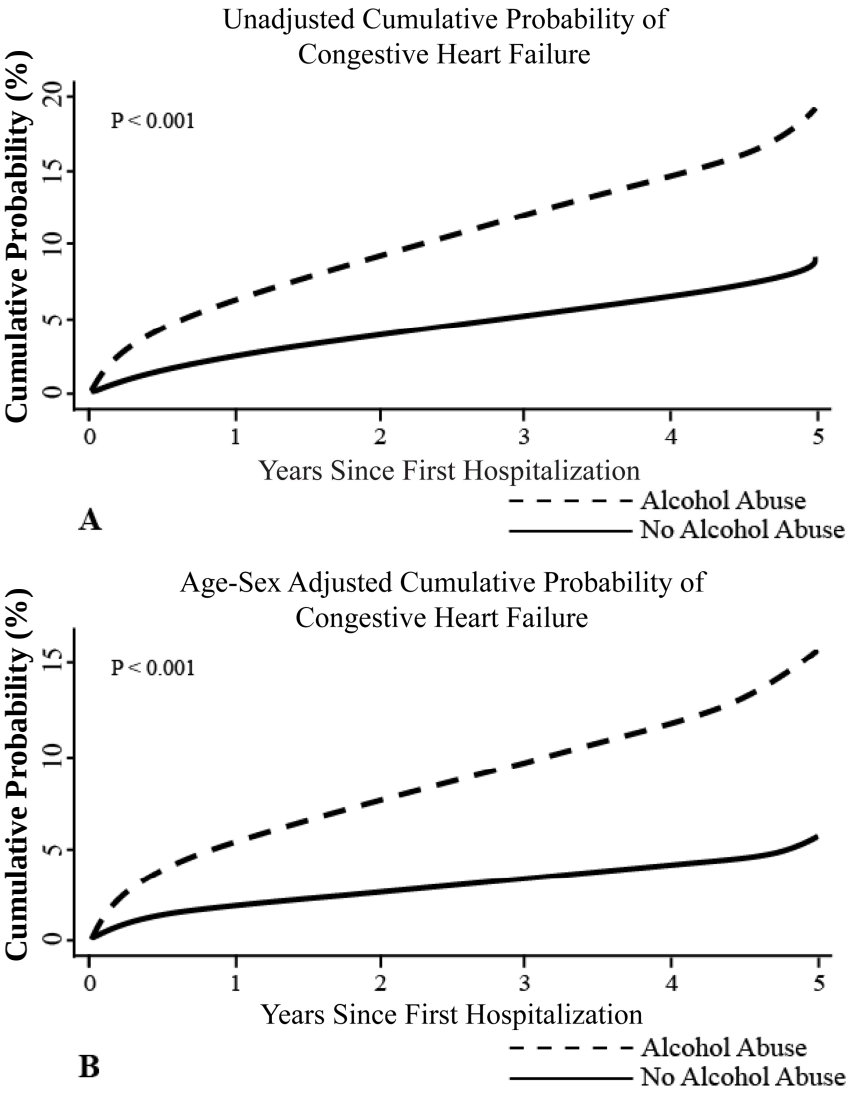
These curves were generated under a proportional hazards assumption. Age by decade was used in adjustment.

Appendix Figure 4: (A) Unadjusted and (B) Age and Sex Adjusted Cumulative Probability of Myocardial Infarction by Presence or Absence of Alcohol Abuse.



These curves were generated under a proportional hazards assumption. Age by decade was used in adjustment.

Appendix Figure 5: (A) Unadjusted and (B) Age and Sex Adjusted Cumulative Probability of Congestive Heart Failure by Presence or Absence of Alcohol Abuse.



These curves were generated under a proportional hazards assumption. Age by decade was used in adjustment.