# What makes a smoker call it quits after a myocardial infarction

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# Agenda

- Background
- Significance
- Hypothesis
- Methodology
- Results
- Conclusion
- Clinical Researcher
  vs. Public health professional
- Question & Answer

# Background

Smoking is a risk factor for

- Acute myocardial infarction (MI)
- Coronary heart disease
- 90% of an initial acute MI

# Background

- Smoking after myocardial infarction (MI) increases
  - Mortality
  - Myocardial oxygen demand
  - Risk of thrombosis
  - 50% increase in risk for re-infarction


- Smoking cessation after MI
  - Reduces the likelihood of readmission to hospital
  - Reduces mortality up to 50%

# Significance

- Only one third to one half of smokers quit smoking after MI
- Smoking cessation after MI may be more effective in reducing mortality rates than therapy with aspirin, beta blockers, or angiotensin-converting enzyme inhibitors

# Significance

- Smoking cessation counseling has been embraced as a performance measure of healthcare quality by
- American Heart Association (AHA)
- American College of Cardiology (ACC)
- Joint Commission on the Accreditation of Hospital Organizations (JCAHO)


- Smith SC, Allen J, Blair SN et al. AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease: 2006 update. *Journal of the American College of Cardiology* 2006;47:2130-2139.
- JCAHO. Overview of the acute myocardial infarction (AMI) core measure set *Joint Commission on Accreditation of Healthcare Organizations* 2002:8-10.

# Hypothesis

Smoking cessation programs and referral to cardiac rehabilitation may be associated with smoking cessation after MI

# Methods
# Study Population

- Prospective multicenter study
- Prospective Registry Evaluating outcomes after Myocardial Infarction: Events and Recovery (PREMIER)
- Admitted with acute MI to 19 US centers during Jan 2003-June 2004

# Inclusion Criteria

- Patients > 18 years of age
- Elevated cardiac enzymes/biomarkers within 24 hours of arrival to hospital
- Other clinical evidence of MI (symptoms, ECG changes)

# Exclusion Criteria

- Transferred from another facility >24 hrs after presentation
- Inability to provide informed consent
- Non-English/Spanish spoken language
- Already enrolled in PREMIER
- Prisoners
- Receiving hospice care

# Patient Assessment

- Interview during MI hospitalization
- Medical Records after discharge
- Follow-up interview by phone at 6 months by a national follow-up center

# Study Measures

- Information obtained during interview:
- Smoking behavior
- Economic burden
- Social support was assessed by the ENRICHD (Enhancing Recovery in Coronary Heart Disease)
- Depressive symptoms by means of the 9-question Primary Care Evaluation of Mental disorders Brief Patient Health Questionnaire (PHQ).

# Study Measures

- Information obtained by chart abstraction:
  - medical history
  - clinical status
  - individual smoking cessation counseling
  - referral to cardiac rehabilitation
  - hospital treatments
  - discharge recommendations

- Information on availability of a smoking cessation program at the admitting hospital obtained through a site survey

# Smoking Behavior

- Smoking behavior assessed by self report
- Smoking behavior questions recommended by

  - Behavioral risk factor surveillance system (BRFSS)
  - Society for research on nicotine and tobacco (SRNT)
  - Question inventory on tobacco (QIT)

- Have been validated in previous research

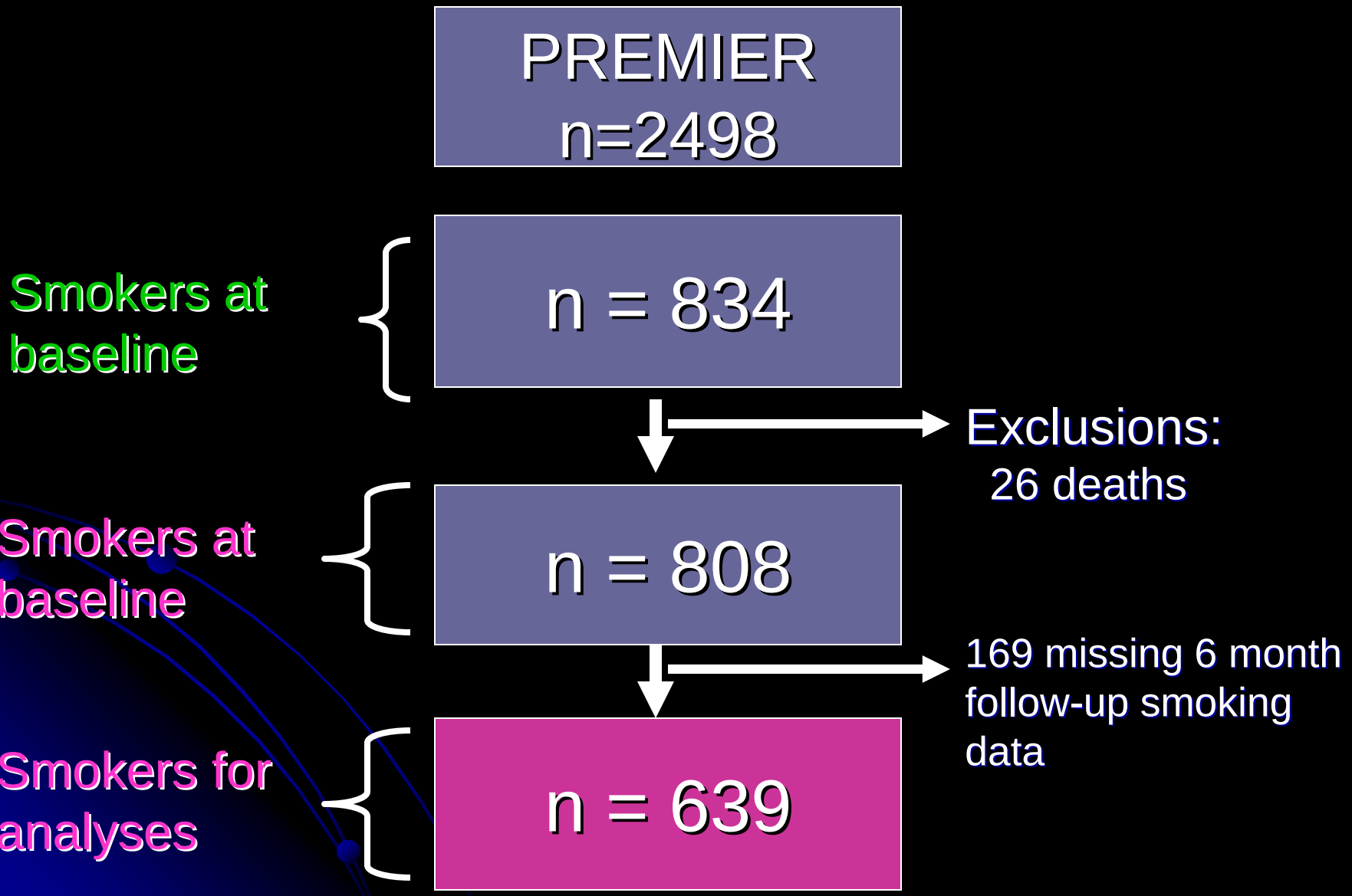
# Study Measures-cont.

Outcome variable:

Smoking cessation after 6 months

- Patients classified as
- having quit if not smoked even a puff within the past 30 days
- continued to smoke if they had a puff in the past 30 days

# Patient Population



# Analysis

- Baseline patient characteristics compared between patients who quit and continued to smoke using T-tests & Fisher exact tests
- Variables that had a statistically significant association in bivariate analysis, included in the final model
- Multivariable, hierarchical logistic regression modeling

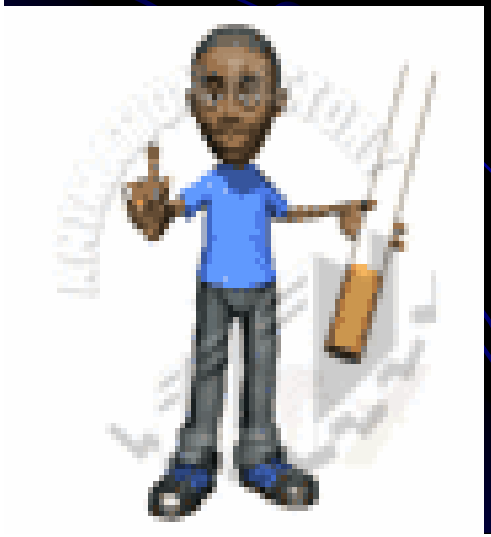
# Factors Controlled For

- Site
- Demographic factors (race, marital status, education)
- Alcohol /cocaine abuse
- Depression
- Medical history
  - HTN
  - Hypercholesterolemia
  - Angina, MI, CABG, PCI
  - Lung disease
- Clinical status on admission (CHF, renal failure)
- Quality performance measures

# Results

- Thirty-four percent (n=836) were smokers at the time of hospitalization

- Only 297 (46%) patients quit smoking at 6 months after MI



# Baseline characteristics between patients who continued to smoke and those who quit at 6 months after myocardial infarction

| | Smoking status at 6 month | | |
|---|---|---|---|
| | Continued n = 342 | Quit n = 297 | P-Value |
| Married | 163 (48.4%) | 194 (65.3%) | <0.001 |
| Economic burden | 94 (27.9%) | 64 (21.7%) | 0.073 |
| Income, < $10,000 | 61 (23.8%) | 29 (13.0%) | 0.002 |
| ENRICHD social support score | 28.0 ± 6.3 | 29.4 ± 6.0 | 0.007 |
| Depression present (PHQ>= 10) | 102 (30.9%) | 51 (17.9%) | <0.001 |
| History of alcohol abuse | 79 (23.1%) | 40 (13.5%) | 0.002 |
| History of cocaine use | 37 (10.8%) | 6 (2.0%) | < 0.001 |
| Prior myocardial infarction | 68 (19.9%) | 35 (11.8%) | 0.005 |
| Prior percutaneous coronary intervention | 56 (16.4%) | 30 (10.1%) | 0.02 |
| Congestive heart failure | 33 (9.6%) | 8 (2.7%) | < 0.001 |
| Availability of smoking cessation program at the admitting hospital | 191 (55.8%) | 204 (68.7%) | < 0.001 |

## Baseline characteristics between patients who continued to smoke and those who quit at 6 months after myocardial infarction

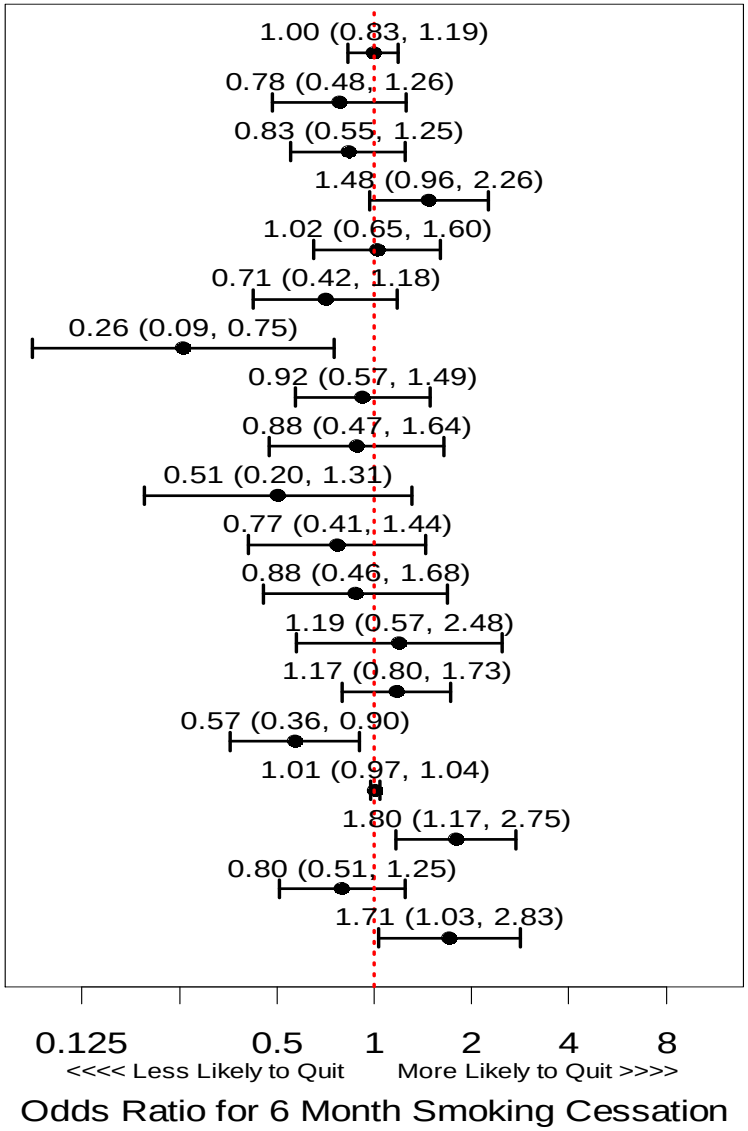
| | Smoking status at 6 month | | |
|---|---|---|---|
| | Continued n = 342 | Quit n = 297 | P-Value |
| **Quality performance measures** | | | |
| Pt instructions: cardiac rehabilitation | 161 (47.1%) | 187 (63.0%) | < 0.001 |
| Pt instructions: diet counseling | 268 (78.4%) | 236 (79.5%) | 0.734 |
| Pt instructions: exercise counseling | 164 (48.0%) | 144 (48.5%) | 0.893 |
| Pt instructions: individual smoking cessation counseling | 247 (72.2%) | 224 (75.4%) | 0.36 |

# Results

- Smoking cessation was not related to
  - Age
  - Gender
  - Education
  - Average number of cigarettes smoked per day
  - Length of smoking history
  - Co morbidities (chronic lung disease, chronic renal failure, and diabetes)

# Multivariable analysis for smoking cessation at 6 months after myocardial infarction

Age (per 10 yr increment)
Caucasian vs. not
Male vs. Female
Married vs. not
Economic burden
History of alcohol abuse
History of cocaine abuse
Diabetes
Lung disease
Congestive Heart Failure
Prior myocardial infarction
Prior percutaneous coronary intervention
Prior coronary artery bypass graft
ST elevation myocardial infarction
PHQ depression score>10
Social support (per score increment)
Referral to cardiac rehabilitation
Individual smoking cessation counseling
Smoking cessation program at hospital



# Conclusions

- Smoking cessation rates remain low after MI
- Individual smoking cessation counseling during the MI hospitalization, as documented in the chart, is not associated with smoking cessation post-MI
- **Availability of hospital-based smoking cessation programs** in the admitting facility and referral to cardiac rehabilitation is associated with increased smoking cessation rates

# Conclusions

- Negative predictors of smoking cessation:

- Depression
- History of cocaine abuse

# Limitations

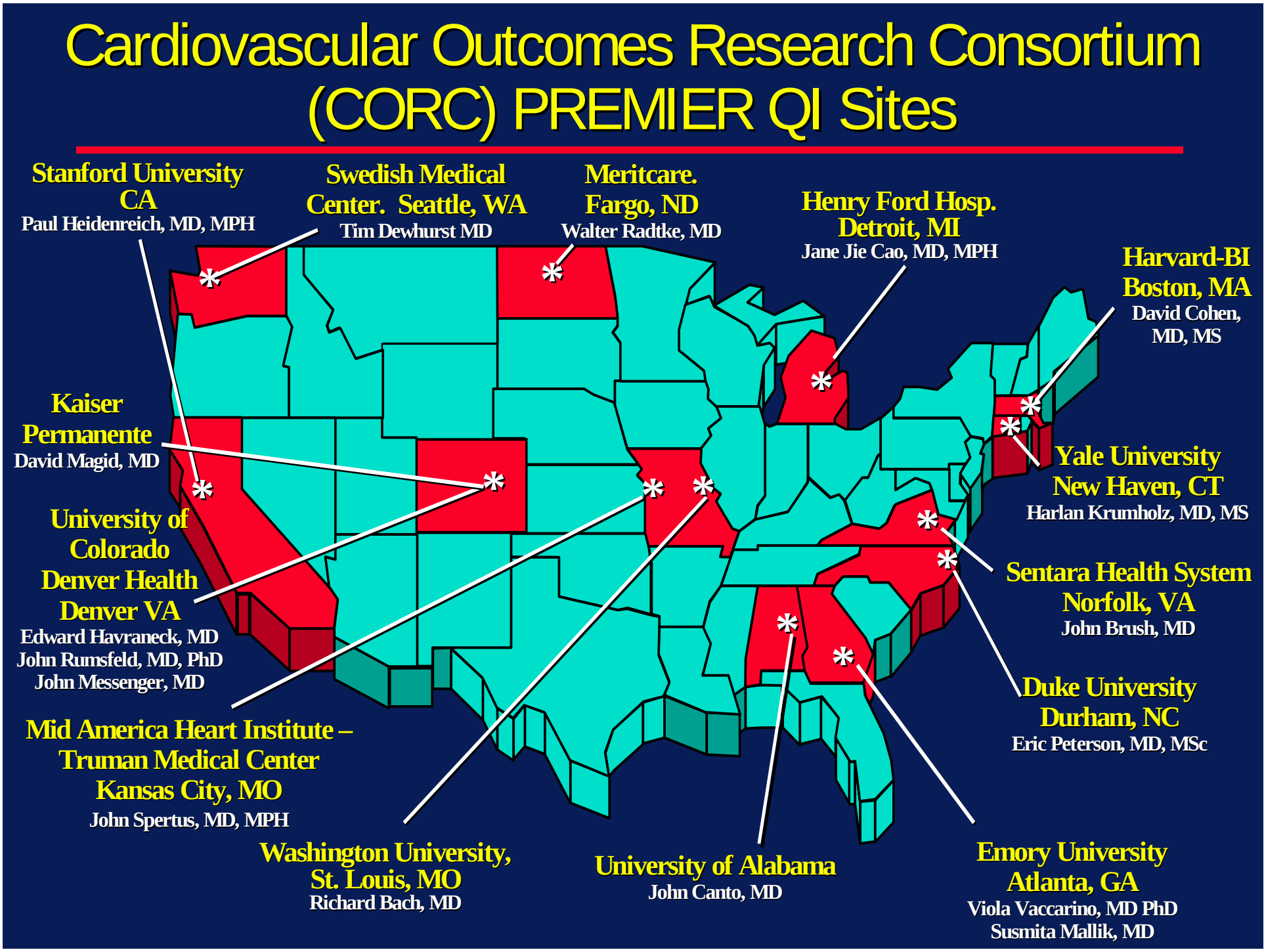
- Limited insights about the types of inpatient smoking cessation programs available
- Loss to follow-up

  However, there was no difference in our findings when adjusting for patient characteristics associated with loss to follow-up
- Smoking status was self-reported using interviewer-administered questionnaires

# Clinical Implications

- **Hospital-based smoking cessation programs, as well as referral to cardiac rehabilitation, were strongly associated with increased smoking cessation rates**
- **Such programs appear under-utilized in current clinical practice and may be a valuable structural measure of healthcare quality**
- **Smoking cessation programs should incorporate screening for and treating depressive disorders**

# Cardiovascular Outcomes Research Consortium (CORC) PREMIER QI Sites



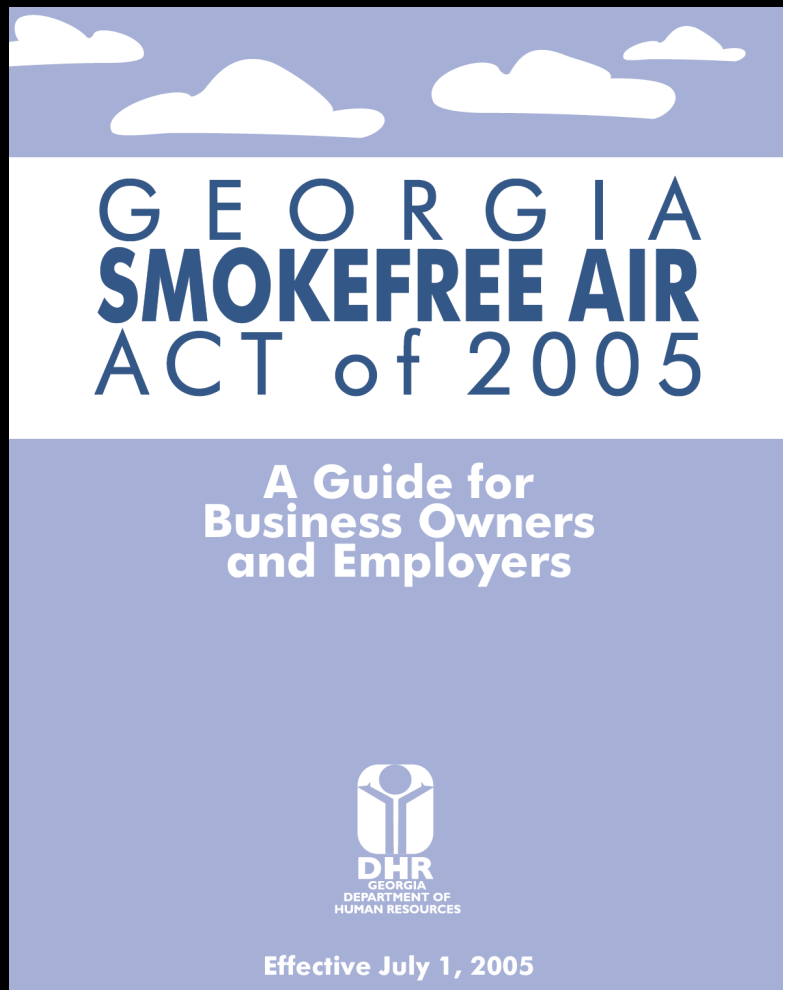
- Three buddies were talking about death and dying. One asked, "When you're in your casket and friends and family are mourning you, what would you like to hear them say about you?"
- The first guy says, "I would like to hear them say that I was a great doctor of my time and a great family man."
- The second man says, "I would like to hear that I was a wonderful husband and school teacher who made a huge difference in our children of tomorrow."
- The last guy says, "I would like to hear them say ---------- !!!"

# Wearing a public health hat

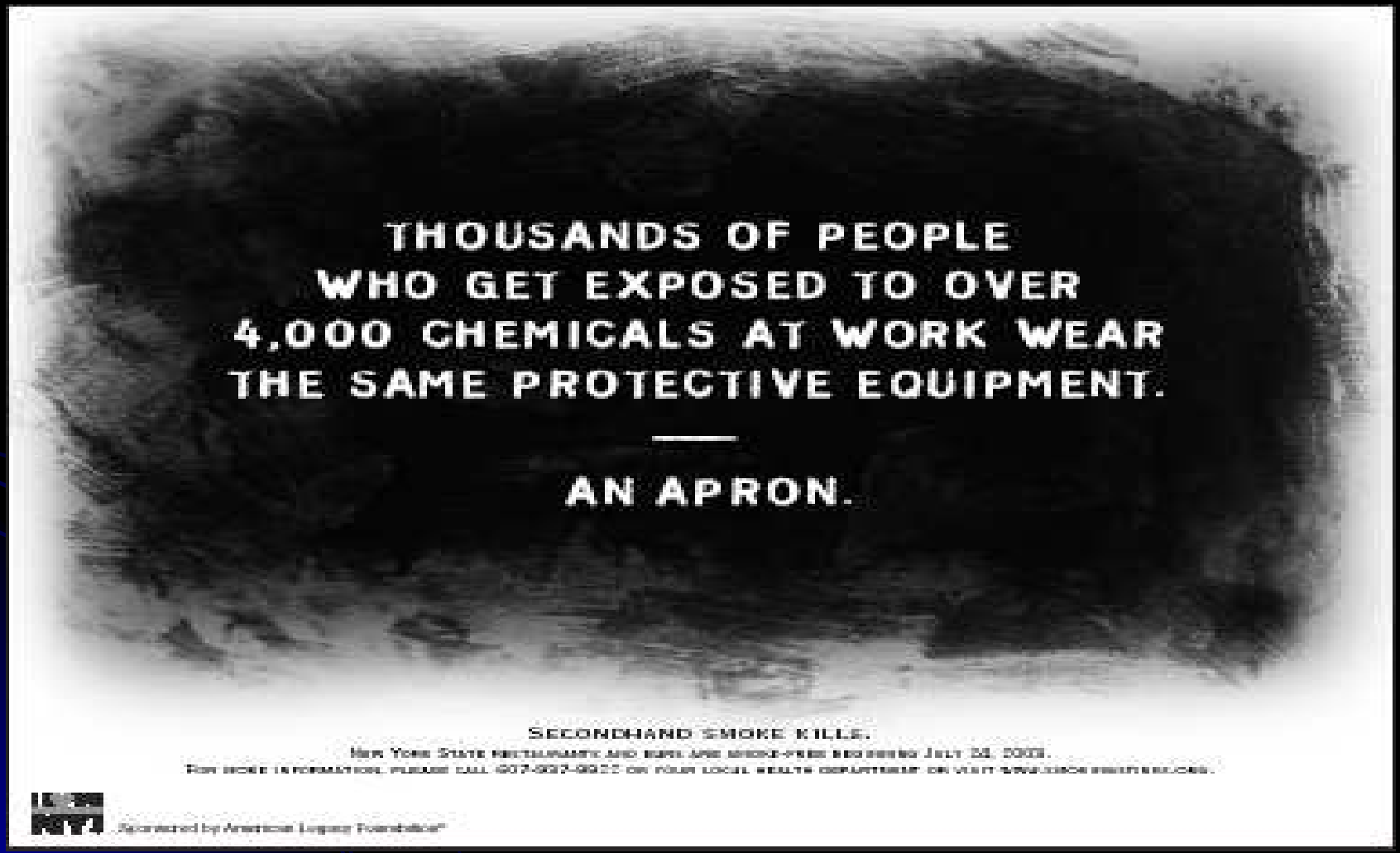
**PREVENTION**

# Restrict tobacco use in public places

- Georgia Smoke free Air Act of 2005
- Need for county and city ordinance



# Mass Media Campaigns



# Restrict sale of tobacco to minors

# Increase Excise Tax on all Tobacco Products

# School-based Interventions

# How you can help?

- **Receiving training on policy advocacy**
- **GET INVOVLED - Mobilize youth and adults to advocate for model policy**
- **Assist in the enforcement of the model policy**
- **Celebrate youth who are attempting to quit**
- **Celebrate youth and adults who are tobacco-free**
- **Educate your community by developing an earned and paid education campaign**

# My thoughts

Combine clinical and public health talents

# Acknowledgements


- Emory University Clinical Research Team
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# Thank You

# Questions/Suggestions

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