PUEBLO HEART STUDY

Webinar Presentation
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The Pueblo Heart Study examined the impact of a municipal smoke-free indoor air ordinance on hospitalizations for acute myocardial infarction in the City of Pueblo, Colorado. The study period was from January 2002 and June 2006.

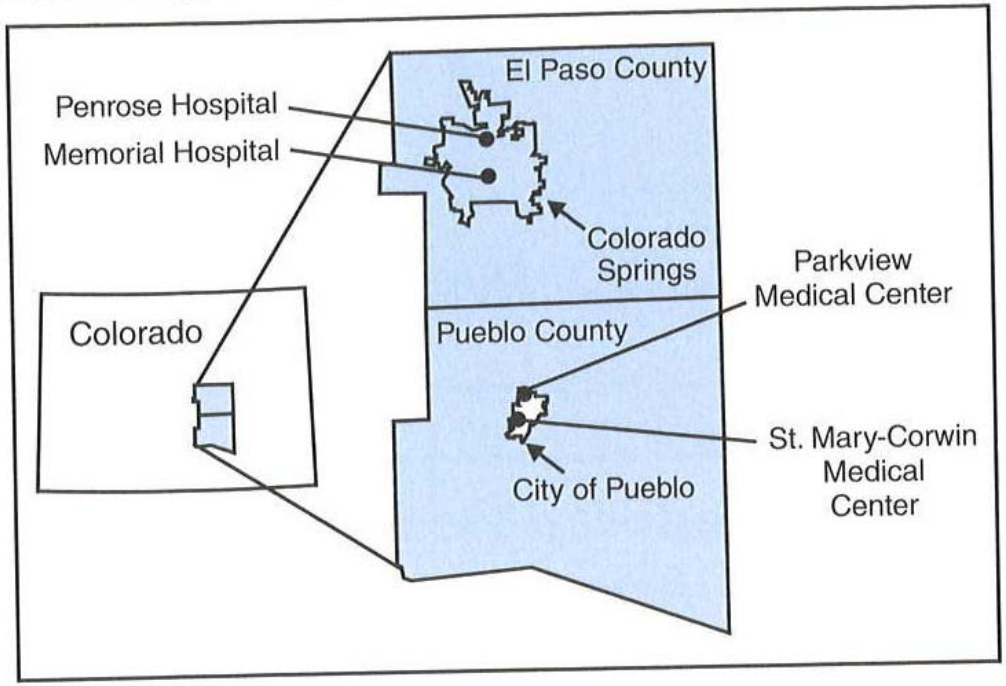
UNIQUE ASPECTS OF PUEBLO HEART STUDY

- Great opportunity for community research
- Obtained technical and financial support
- Build on previous study in Helena, MO
- Two distinct control areas
- Standard of care unchanged
- Hospital care
- Longest study at the time (36 months)

STUDY DESIGN AND METHODS

- Study period was from January 2002 to June 2006
- Two control sites were Pueblo County outside of the city limits and El Paso County
- Residence was determined by zip code
- Diagnosis of acute myocardial infarction in hospitalized patients who resided in the two counties was used
- Hospitalizations for acute myocardial infarctions were studied from the two hospitals in Pueblo and two hospitals in Colorado Springs along with the variables, age and gender
- AMI patients who were transferred from outside facilities or came from other counties were excluded
- This data was obtained from the Colorado Hospital Association administrative database
- The data included admission date, primary diagnosis code, gender, age, zip code, and hospital name
- Secondary AMI diagnoses were excluded seasonality was accounted for in the analysis

FIGURE 1. Pueblo smoke-free area, comparison areas, and hospitals treating acute myocardial infarction patients — Pueblo Heart Study, January 2002–June 2006

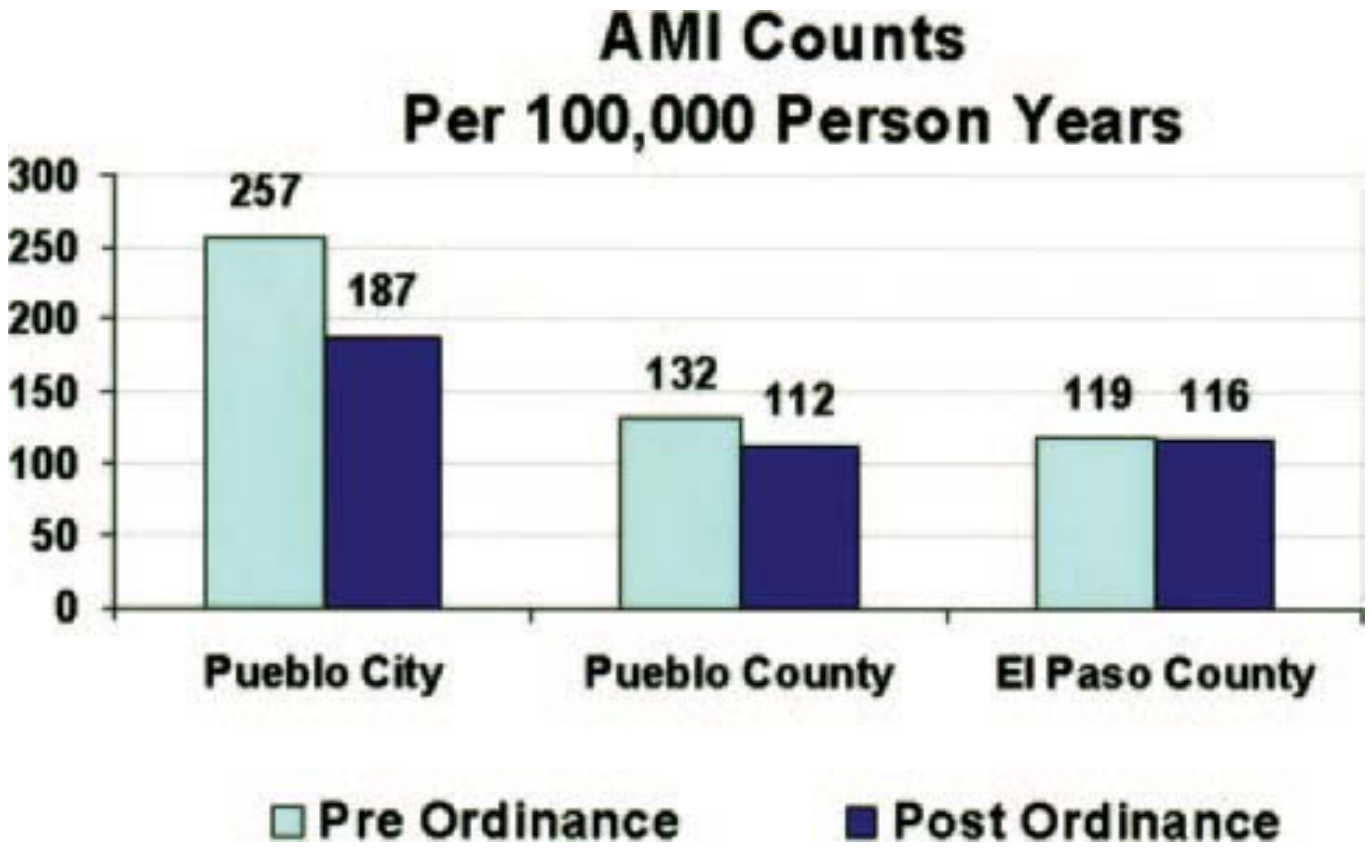


PUEBLO HEART STUDY PHASE 1

- Reduction in the Incidence of Acute Myocardial Infarction Associated with a City Wide Smoking Ordinance
- Published in Circulation, Journal of the American Heart Association
- 2006:114:1490-6
- Authors: Carl Bartecchi, MD; Robert N. Alsever, MD; Christine Nevin-Woods, DO, MPH; William M. Thomas, PhD; Raymond O. Estacio, MD; Becki Butcher Bartelson, PhD; Mori J. Krantz, MD

PUEBLO HEART STUDY PHASE 1

- PHASE 1- Compared Phase 1 post implementation period (July 2003 to December 2004) to the pre implementation period (January 2002 to June 2003)
- Each period was 18 months
- Study demonstrated a 27 percent decrease in hospitalizations for acute myocardial infarctions in residents of the City of Pueblo from the 18 month period before the ordinance took effect to the first 18 month period afterward
- No significant changes in AMI hospitalizations were observed in the two control areas


AMI Counts
Per 100,000 Person Years
300
250
200
150
100
50
0
257
187
132
112
119
116
Pueblo City
Pueblo County
El Paso County
Pre Ordinance
Post Ordinance

REACTION TO PHASE 1 PUEBLO HEART STUDY

- Professional skepticism
- Keen interest by media and public
- Time Magazine
- Findings compelling
- Ground work for future studies
- Decision to extend study to 36 months
- Support and collaboration with CDC

PUEBLO HEART STUDY PHASE 2

- Reduced Hospitalizations for Acute Myocardial Infarction After Implementation of a Smoke-Free Ordinance – City of Pueblo, Colorado, 2002-2006
- Published in the Morbidity and Mortality Weekly Report (MMWR), Publication of the Department of Human Services, Centers for Disease Control and Prevention
- January 2, 2009/Vol.57/No. 51&52
- Authors: RN Alsever, MD; WM Thomas, PhD; C Nevin-Woods, DO, MPH; R Beauvais; S Dennison; R Bueno; L Chang, PhD; CE Bartecchi, MD; S Babb, MPH; A Trosclair, MS; M Engstrom, MS; T Pechacek, PhD; R Kaufmann, PhD

CDC

MMWR

Morbidity and Mortality Weekly Report

www.cdc.gov/mmwr

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Reduced Hospitalizations for Acute Myocardial Infarction After Implementation of a Smoke-Free Ordinance — City of Pueblo, Colorado, 2002–2006

Exposure to secondhand smoke (SHS) has immediate adverse cardiovascular effects, and prolonged exposure can cause coronary heart disease (*1*). Nine studies have reported that laws making indoor workplaces and public places smoke-free were associated with rapid, sizeable reductions in hospitalizations for acute myocardial infarction (AMI) (*2–7*). However, most studies examined hospitalizations for 1 year or less after laws were implemented; thus, whether the observed effect was sustained over time was unknown. The Pueblo Heart Study examined the impact of a municipal smoke-free ordinance in the city of Pueblo, Colorado, that took effect on July 1, 2003 (*3*). The rate of AMI hospitalizations for city residents decreased 27%, from 257 per 100,000 person-years during the 18 months before the ordinance's implementation to 187 during the 18 months after it (the Phase I post-implementation period).* This report extends that analysis for an additional 18 months through June 30, 2006 (the Phase II post-implementation period). The rate of AMI hospitalizations among city residents continued to decrease to 152 per 100,000 person-years, a decline of 19% and 41% from the Phase I post-implementation and pre-implementation period, respectively. No significant changes were observed in two comparison areas. These findings suggest that smoke-free policies can result in reductions in AMI hospitalizations that are sustained over a 3-year period and that these policies are important in preventing morbidity and mortality associated with heart disease. This effect likely is mediated through reduced SHS exposure among nonsmokers and reduced smoking, with the former making the larger contribution (*4,6,7*).

Two control sites were selected for comparison with the city of Pueblo: 1) the area of Pueblo County outside the city of Pueblo limits and 2) El Paso County, including Colorado Springs, the most populous city in this county. The city of Pueblo and Colorado Springs are located approximately 45 miles apart (Figure 1). Neither of the control sites had smoke-free laws in place before or during the study periods. Based on data from the Behavioral Risk Factor Surveillance System, the adult smoking prevalence for Pueblo County (including the city of Pueblo) and El Paso County during 2002–2003 was 25.9% (95% confidence interval [CI] = 20.2%–31.6%) and 17.4% (CI = 14.5%–20.2%), respectively. The corresponding prevalences for 2004–2005 were 20.6% (CI = 15.4%–25.8%) and 22.3% (CI = 19.3%–25.4%). Separate smoking prevalence estimates were not available for the city of Pueblo.

Persons with recognized AMIs that occur in the city of Pueblo and Pueblo County receive care at two hospitals, Parkview

*Some of the AMI hospitalization admission figures, AMI hospitalization admission rates, relative rates, and relative rate confidence intervals calculated for this analysis differ from those previously published (*3*) because of receipt of routinely amended coding data from the Colorado Hospital Association.

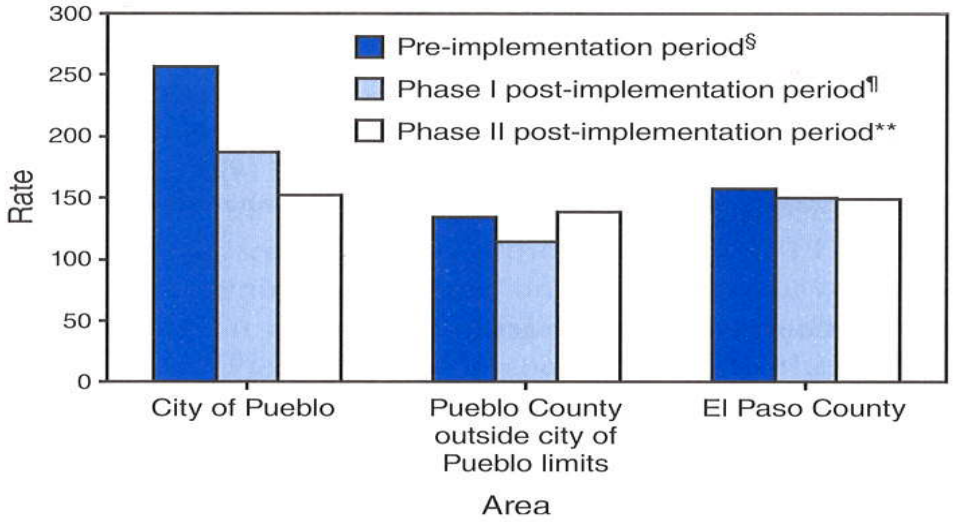
INSIDE

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

PUEBLO HEART STUDY PHASE 2

- Phase 2 extended the analysis for an additional 18 months, covering 54 months total, 18 before the ordinance and 36 after the ordinance
- There was an additional 19% decrease from phase 1 to phase 2
- Study demonstrated a total decrease of 41%
- Again, no significant changes were observed in the two comparison control areas

FIGURE 2. Rate* of hospitalizations for acute myocardial infarction before and after smoking ordinance, by area and period — city of Pueblo, Pueblo County outside city of Pueblo limits, and El Paso County, Pueblo Heart Study, January 2002–June 2006†



* Per 100,000 person-years. Based on U.S. Census Bureau population data for 2006.

† Because of receipt of routinely amended coding data from the Colorado Hospital Association, certain data points for the pre-implementation and Phase I post-implementation periods differ from those published previously (Bartecchi C, Alsever RN, Nevin-Woods C, et al. Reduction in the incidence of acute myocardial infarction associated with a citywide smoking ordinance. Circulation 2006;114:1490–6).

§ January 2002–June 2003.

¶ July 2003–December 2004.

** January 2005–June 2006.

LESSONS LEARNED

- Good quality studies can be done at local community and regional level
- Future studies are important to add to the growing evidence that tobacco ordinances and laws improve cardiovascular health and decrease hospitalizations for acute myocardial infarctions
- Ecologic studies have limitations
- Other variables, such as smoking status, were unable to be obtained due to stricter confidentiality rules at non research/university hospitals
- Community research builds pride and support of tobacco ordinances
- Important to have a mechanism to strictly enforce the ordinance