Southern California Children's Health Study

Conducted by the University of Southern California

Supported by the California Air Resources Board

Southern California Children's Health Study

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Southern California Children's Health Study
Ambient Air Quality Monitoring Sites

Figure 3-1. Locations of the ambient air monitoring sites.

Overall Objective

- To determine whether chronic respiratory effects are produced by air pollutants in Southern Californian children

Southern California Children's Health Study

10 Year Longitudinal Study in Schools:

- Exposure to air pollutants in 12 communities
- Respiratory illness
- Lung function
- School Absence monitoring

Health Assessments

Pulmonary Function Testing

Exposure Assessment (Ambient)

One Station per Community

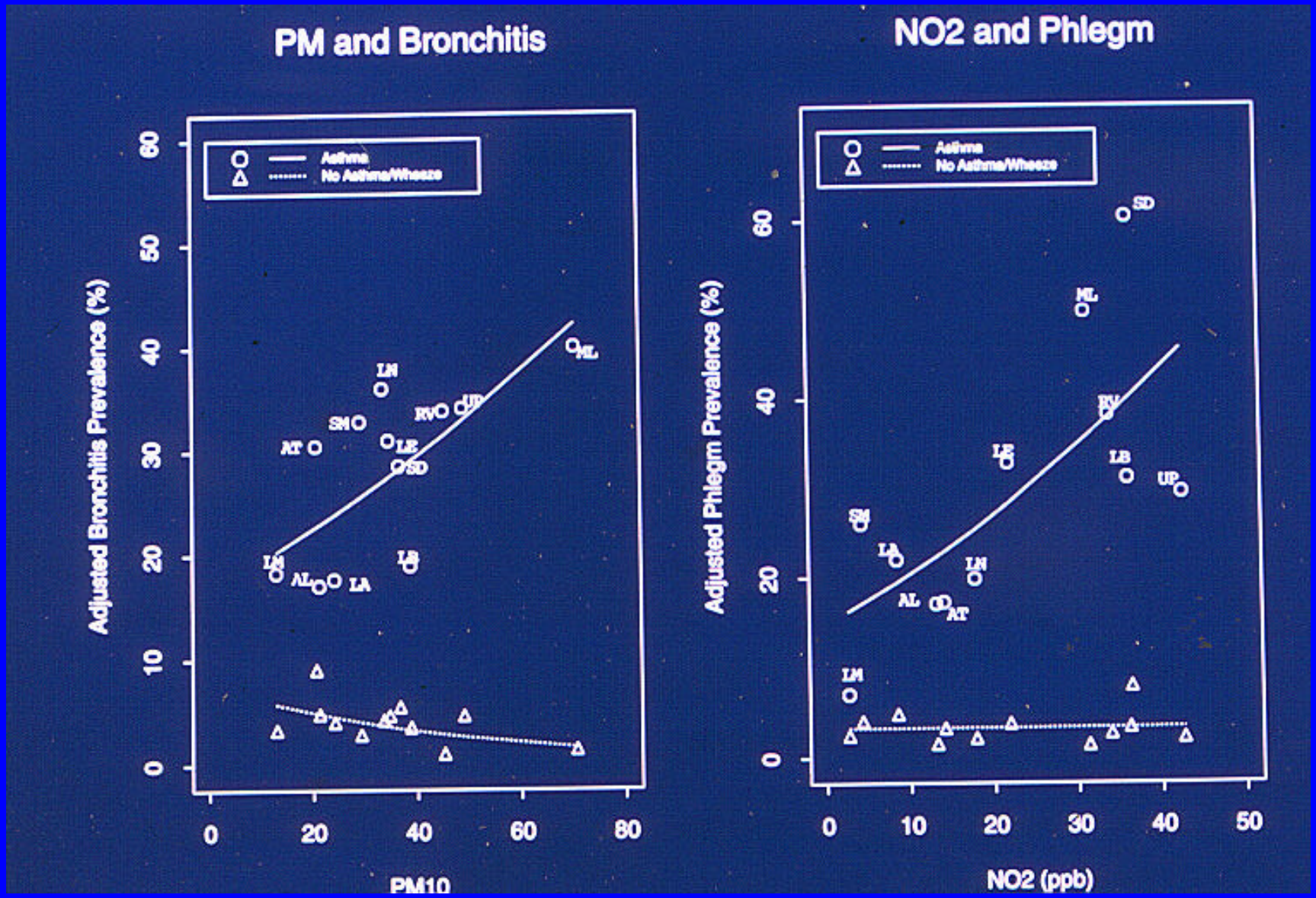
- hourly O_3 measurement
- hourly NO_2 measurement
- hourly PM_{10} measurement
- two-weekly $PM_{2.5}$ measurement (SO_4, NO_3, NH_4)
- two-weekly acid vapor measurement

Exposure Assessment (Personal)

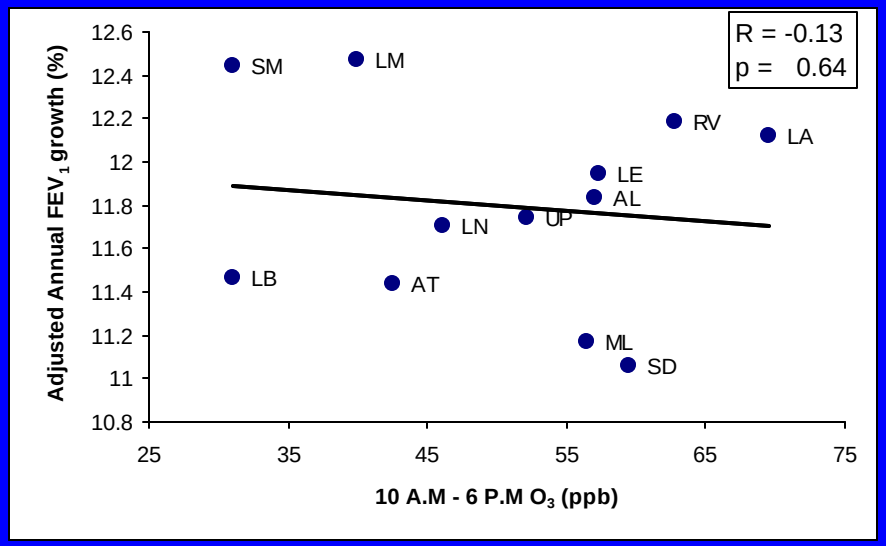
- Spatial activity
- Temporal activity
- Physical activity
- Residential history
- Ambient data

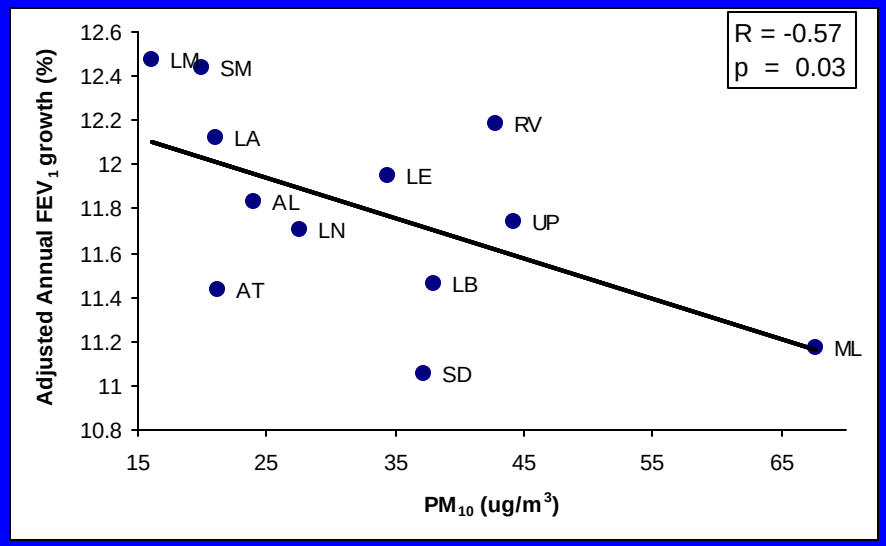
Study Populations (age)

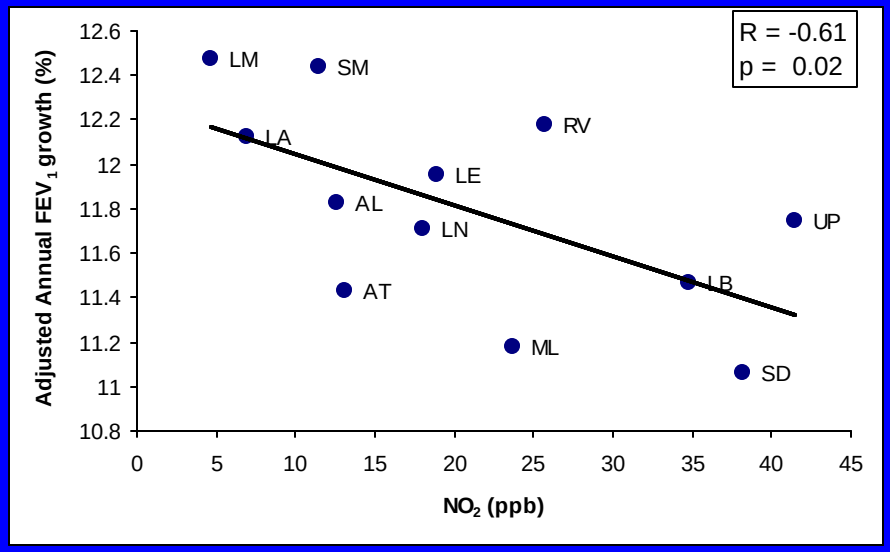
(#)	1993	1994	1995	1996	1997	1998	1999	2000	2001
(1800)	10	11	12	13	14	15	16	17	18
(900)	13	14	15	16	17	18			
(900)	16	17	18						
(2000)				10	11	12	13	14	15

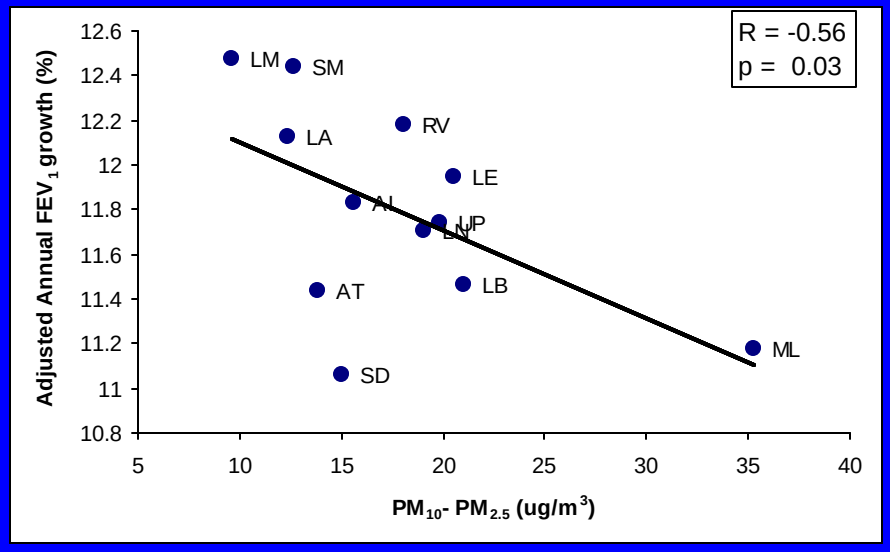

PM and Bronchitis
Asthma
No Asthma/Wheeze
Adjusted Bronchitis Prevalence (%)
PM10
0
20
40
60
80
10
30
50
ML
LN
SM
RV
UP
AT
LE
SD
LB
AL
LA
NO2 and Phlegm
Asthma
No Asthma/Wheeze
Adjusted Phlegm Prevalence (%)
NO2 (ppb)
0
10
20
30
40
50
60
SD
ML
RV
LE
LB
UP
SM
LA
LN
AL
AT

FEV1 Changes and Air Pollution









Acute Respiratory Illness Absence

- School absences increase by 83% with a 20ppb increase in ozone

Effects of Migration on Lung Function Growth

More polluted to less polluted--improvement

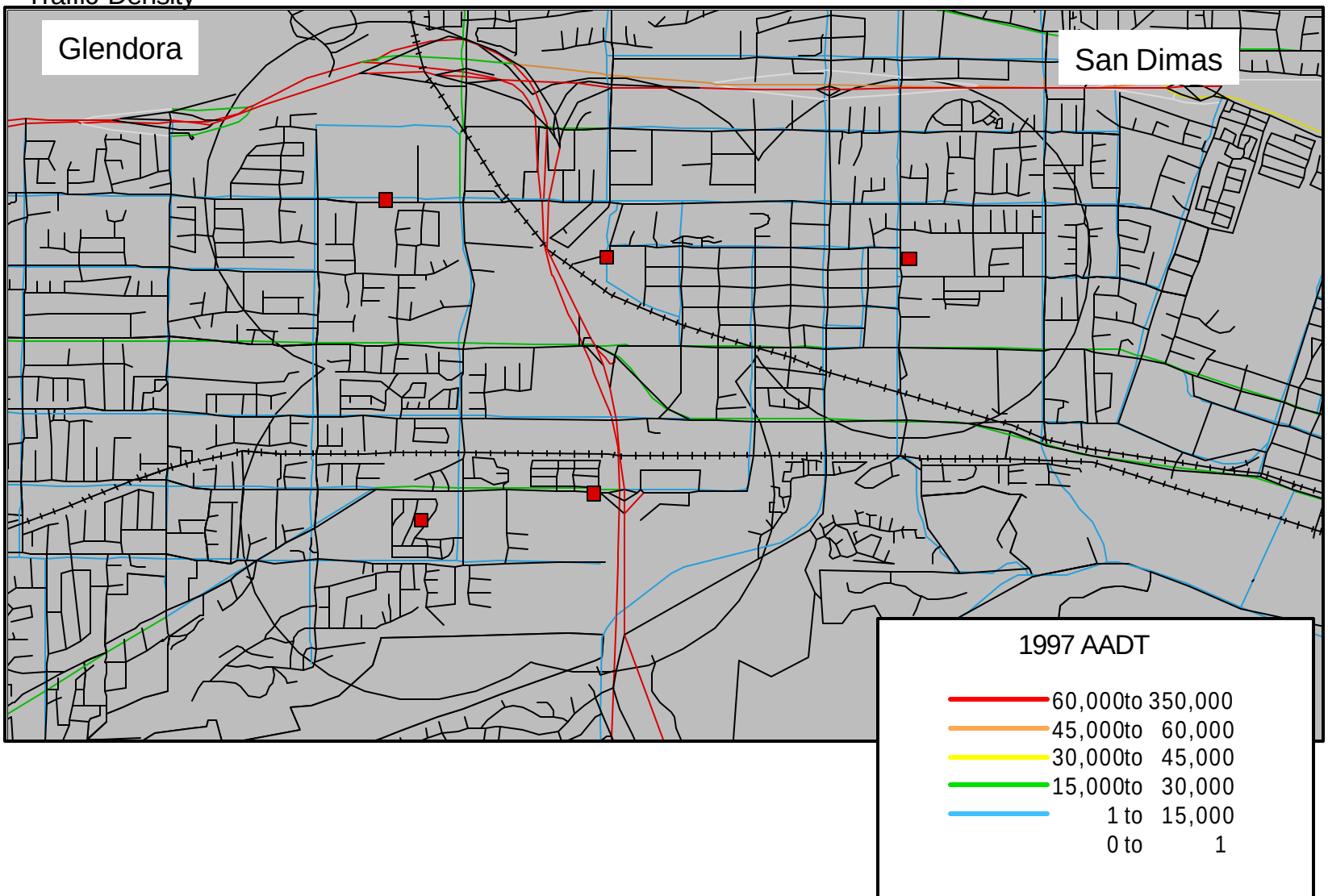
Less polluted to more polluted--worsening

Ambient and Personal Exposures

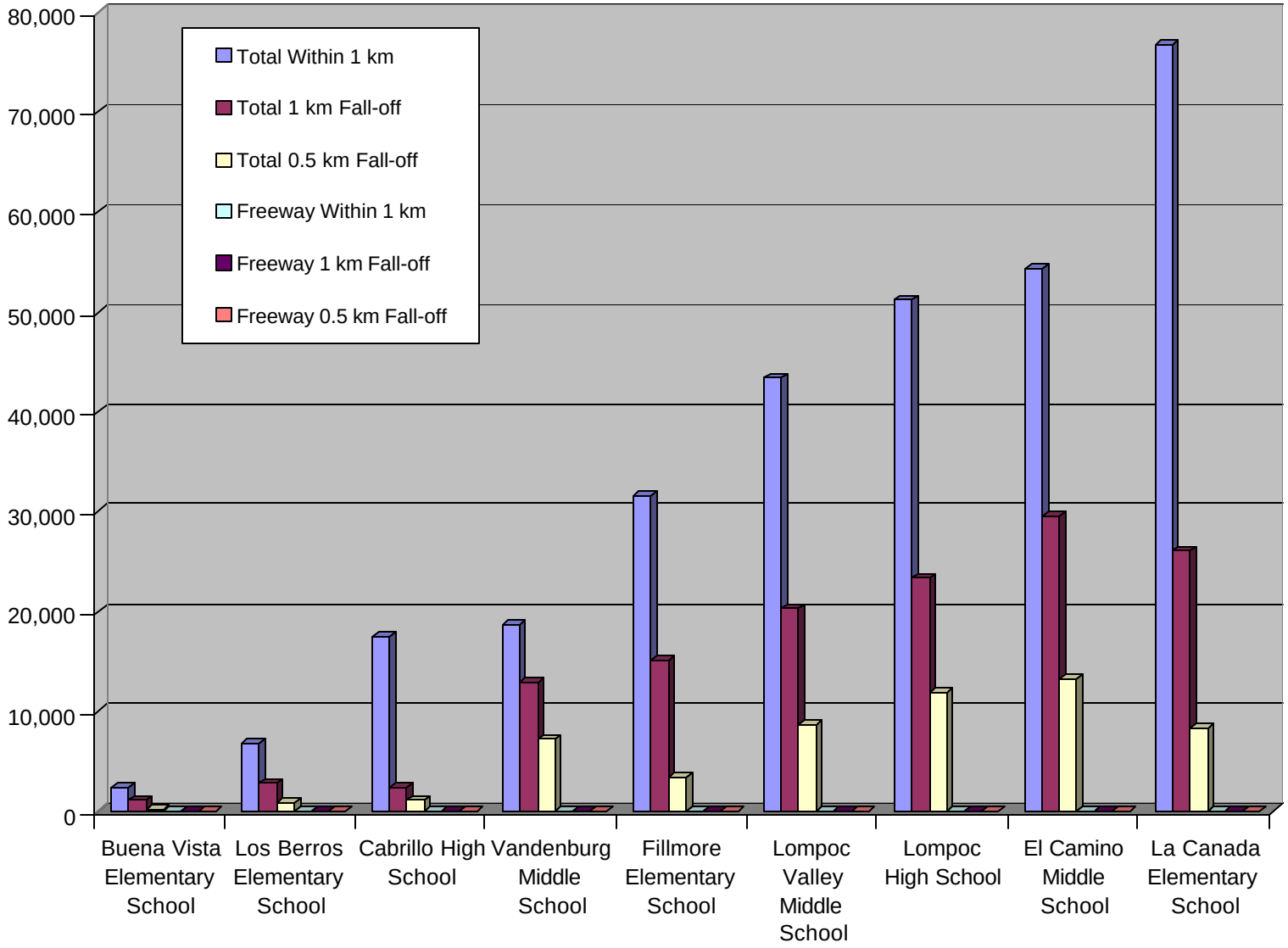
- Study design allows comparisons between and within communities
- Between-communities comparisons address effects of ambient exposures
- Within-communities comparisons address effects of personal exposure and local variation (e.g., traffic patterns)

San Dimas / Glendora

Traffic Density



Traffic Density Near Schools in Lompoc



Summary

- Study is not finished so no conclusions are final
- NO_2, PM and acid vapor associated with slowed lung function growth
- Children with asthma get bronchitis when there is more PM or NO_2
- School absences for respiratory disease associated with O_3 exposure
- Migration of subjects has expected effect