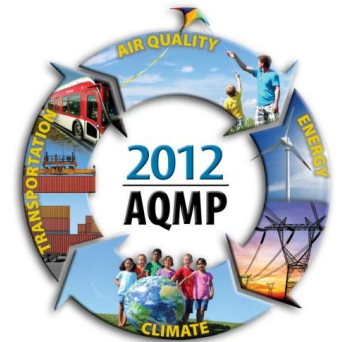




Particulate Matter Health Effects



SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

REGIONAL PUBLIC HEARINGS
NOVEMBER 13-15, 2012

Cleaning The Air That We Breathe...

Appendix I – Health Effects



- **Content**

- Criteria pollutants

- Ozone, PM, CO, NO₂, SO₂, sulfates, lead

- Toxic air contaminants

- Overview of health effects

- Rely on EPA and CARB reviews and assessments



Report on PM in South Coast



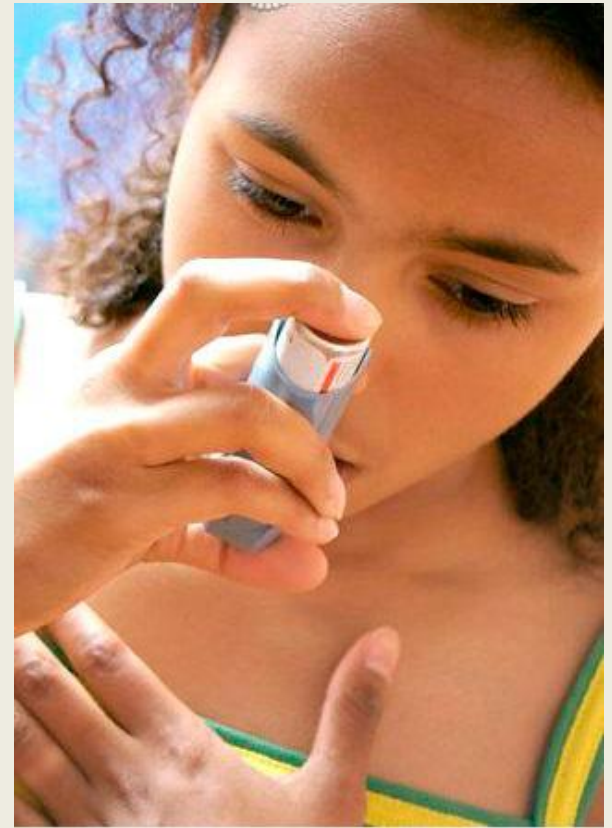
- Prepared in conjunction with public health agencies, CARB and OEHHA (*California Health & Safety Code §40471*)
- Advisory Council formed June 2012 (*California Health & Safety Code §40471*)
 - 16 members chosen by Governing Board and Advisory Groups (*California Health & Safety Code §40428*)
- Report included in Appendix I of 2012 AQMP
 - Report modified to reflect Advisory Council and health agency comments received
 - Circulated with Draft 2012 AQMP since July 2012
 - All written comments received included



Summary of Findings



- ❑ Large body of scientific evidence shows adverse impacts of air pollution on human health
- ❑ Population-based and laboratory studies link air pollution and increased morbidity
 - In some instances, earlier mortality
- ❑ Methods to study air pollution health effects have progressed
- ❑ For some pollutants, no clear thresholds for effects have been demonstrated
- ❑ Consistent with EPA Clean Air Scientific Advisory Committee



PM Effects



EPA Causal Determinations of PM2.5

Health Outcome	Short-Term Exposure	Long-Term Exposure
Cardiovascular effects	Causal relationship	Causal relationship
Respiratory effects	Likely to be causal relationship	Likely to be causal relationship
Mortality	Causal relationship	Causal relationship
Reproductive and Developmental	---	Suggestive of a causal relationship
Cancer, Mutagenicity, Genotoxicity	---	Suggestive of a causal relationship

SoCal Specific Studies



- **Association of mortality and PM2.5**
 - **Magnitude of association varies with model specification and confounding variables**
- **Mortality from ischemic heart disease shows strongest association**
- **Carotid artery thickness associated with PM2.5**



Comments on Appendix I



Comment	Response
No health risk associated with PM in California	Large body of scientific evidence, including local Southern California studies, associate air pollution to health risks
PM exposures not associated with mortality in California	Results from California studies mixed for all cause mortality; Recent Calif. study found associations for all cause mortality only when variable for urban residence included, but association with IHD mortality found with all model specifications; Recent So Cal specific study found association with all cause and ischemic heart disease mortality
Specify exposure conditions for respiratory effects	Clarified health effects with different exposure concentrations on different age groups
Meaning of causal relationship unclear	Provided EPA's weight of evidence descriptions for causality determinations
Indoor air quality should be analyzed	Indoor studies were not focus of review

Comments on Appendix I (con't)



Comment	Response
Diesel PM is carcinogenic toxic air contaminant	Included reference to recent IARC review conclusion that diesel exhaust causes human lung cancer
Include ranges for particulate matter studies findings	Included EPA charts showing ranges of health effect findings for particulate matter population studies
PAHs are etiologic agents associated with health risk	Section on Toxic Air Contaminants focused on substances most related to health risk in So Cal
Cite more recent references and enhance discussion of sources	Included additional references and revised Appendix I accordingly
Specific comments (e.g. wording, add/correct citations, clarifications)	Revised Appendix I accordingly