# Exposure to small particle pollution linked to heart-disease death

By Edward Ortiz, staff writer
Sacramento Bee, Wed., Feb. 25, 2015

Data from about 8,000 women living in the Sacramento metropolitan area were used in a major study – released Wednesday – that linked death from heart disease to exposure to soot found in car exhaust, cooking smoke and diesel pollution.

The study, one of the most comprehensive to date, used data from the tracking of 100,000 middle-aged women in California between 2000 and 2007.

The study was conducted by the state's Office of Environmental Health Hazard Assessment, as well as UC Davis and other institutions. It found an association between areas where there are high levels of fine particle pollution, and shorter life spans and a risk of heart disease death.

A growing body of evidence has shown that particle pollution is linked to increased risk of heart disease, lung cancer and asthma attacks.

California's Air Resources Board estimates that 9,000 people die prematurely each year from exposure to particulate matter.

The OEHHA study is one of the first to look at the long-term effects of ultrafine particles – tiny particles that are a thousand times smaller than the width of a human hair, and tiny enough to pass through lung tissue and into the bloodstream. Most prior studies looked at much shorter exposures – usually a day or two – or at larger particles called fine particles.

The implication of the study is that those who live near freeways or active farms that use diesel machinery, and those who cook in or live near restaurants, may be at higher risk of breathing the particulate matter, said Mike Kleeman, professor of civil and environmental engineering at UC Davis.

The university provided long-term estimates of exposure the women had to ultrafine particles within a 2.5-mile area, said Kleeman.

The information was matched to health records in each area. According to the study, researchers found that women who lived in areas with more pollution from ultrafine particles suffered a higher death rate from heart disease.

"Where mortality should be highest is where there is the highest pollution – and those are places like Bakersfield and Central Valley population centers," said Kleeman. "Sacramento has its own challenges with major freeways and wood smoke.

"If you look around a city like Sacramento there are two things emitting smoke right now – one are the fireplaces and the other is cooking operations that use an open flame where the fat drips to an open flame," Kleeman added. "That produces these ultrafine particles."
Kleeman said people who live near refineries and ports are also at risk of exposure to fine and ultrafine particle pollution.

The data on the women were culled from California teachers and administrators recruited from the California State Teachers Retirement System, said Bart Ostro, a researcher at OEHHA's Air Pollution Epidemiology Section and lead author of the study, which appeared in the journal Environmental Health Perspectives.

Ostro said the data collected over the eight-year period was matched to information about particulate matter found in a 2.5-mile area where the women lived. Using that data, the study was able to eliminate risk factors that would cause death – such as smoking and drinking – as well as other factors such as socio-economic status.

“Then we looked at whether the women that lived where there were high levels of ultrafine particle exposure died earlier than those in areas where the levels were lower,” Ostro said. “We were able to rule out the possibility that the associations between exposure to ultrafine particles and death from heart attacks happened by chance.”

Ostro did not say what areas saw the highest mortality and said the scope of the study did not establish which women died from heart attacks.

“The data has not yet been analyzed to the point of estimating a specific number of deaths,” said Ostro.

But he said the researchers found that certain elements, such as copper, iron and elemental carbon – or soot – were strongly associated with death from heart attacks.

Kleeman said that more research will establish a closer link between particulate exposure and heart attack deaths.

“Air pollution is still an issue for California, and there are aspects of air pollution that we do not claim to understand yet,” said Kleeman. “The role of these ultrafine particles is something that we’re still actively investigating.”

## Ultrafine particles linked to California heart disease deaths, study finds

By Tony Barboza, staff writer
LA Times, Thursday, Feb. 26, 2015

A new study by California scientists has linked chronic exposure to microscopic air pollutants in vehicle exhaust to deaths from heart disease. The finding bolsters evidence that ultrafine particles, which are not regulated by state or federal environmental agencies, are a key contributor to health problems among people living near traffic.

Scientists analyzed health data from 2001 to 2007 on a cohort of more than 100,000 middle-aged women across California who had worked as school teachers or administrators. They used a computer model to estimate the levels of ultrafine particles the women breathed.

The authors said their study, recently published in the journal Environmental Health Perspectives, is the first to examine the effects of long-term exposure to ultrafine particles. The pollutants are about one-thousandth the width of a human hair and are released during combustion by car, truck and airplane engines, kitchen stoves, fireplaces and other sources.

The analysis found a stronger association between ultrafine particles and early deaths from heart disease than for fine particles, which are 25 times larger and regulated by state and federal emissions rules.

The study identified some components of ultrafine particle pollution, including soot-laden exhaust from diesel engines and specks of copper from vehicle brake pads, that were more strongly associated with heart disease deaths than others.

The findings are the latest to raise concerns about health effects from ultrafine particles, which are so small they can pass through the lungs and into the bloodstream, critical organs and brain. Past research has suggested ultrafine particles as a potential cause of health problems associated with living near traffic, where residents breathe more polluted air, but it remains an area of active study.

Major roadways were among the most ubiquitous of hundreds of sources of ultrafine particle pollution examined in the study. Other contributors included oil refineries, off-road construction equipment, cook stoves, seaports and fires.

The analysis by scientists at California’s Office of Environmental Health Hazard Assessment, the Cancer Prevention Institute of California, the City of Hope National Medical Center and UC Davis, found a link between the pollutants and heart disease deaths even after controlling for more than two dozen other risk factors, including smoking, drinking and exercise.

While some heart disease risks are genetic or cannot easily be changed, “air pollution is something we can deal with,” said Bart Ostro, an air quality researcher with OEHHA and UC Davis and lead author of the study. “It’s something we can reduce with the proper standards in place.”

## County, Sierra Club settle lawsuit

By David Castellon, staff writer
Visalia Times-Delta, Wed., Feb. 25, 2015

A lawsuit filed nearly two-and-a-half years ago by members of a South Valley Sierra Club has been settled, with the county making 11 concessions intended to make its 2030 General Plan Update more environmentally friendly.

Shortly after the start of their weekly public meeting on Tuesday, the county Board of Supervisors went into closed session. Afterward, the five supervisors returned to the public meeting and announced they had discussed a settlement offer, and then they voted unanimously to approve it.

“This is monumental for Tulare County,” Board chairman Steve Worthley told the audience.

The General Plan Update essentially is a road map of where Tulare County leaders will allow and promote new development and population growth through 2030, along with what types of development will be allowed in various parts of the county.

But after the board approved the update in August 2012, the county received challenges that included the lawsuit filed the following month by the Kern-Kaweah chapter of the Sierra Club over environmental concerns.

“The reason we filed suit was the plan didn’t commit the county to anything about many of the major issues as far as we saw — air pollution, farmland loss, water issues, climate change,” said Gordon Nipp, vice chairman of the Sierra Club chapter that covers Tulare, Kings and Kern counties.

“The language was very permissive,” he said, adding that before the county’s passage of the General Plan, Sierra Club members turned in letters to county officials with hundreds of pages commenting on the update.

Other challenges to the update included a lawsuit by the city of Porterville centered largely on the county recognizing a sphere of influence around the city in which new development would have to follow Porterville’s building standards so they would be the same if the city were to incorporate those areas in the future.

That suit has been settled, noted the county’s Chief Administrative Officer, Jean Rousseau, who added that the Sierra Club suit was the only legal challenge to the update still active.

The thick agreement that already had been signed by Nipp on behalf of the Sierra Club, covers 11 matters that the county agrees to take action. They include requirements that some new homes in unincorporated parts of the county would have to be solar powered, provisions to secure some prime farmland from being developed in the future and restrictions on how long diesel trucks could idle in order to reduce emissions.

Rousseau wouldn’t discuss in great detail what concessions the Sierra Club made in the legal negotiations, but he noted that the environmental group wanted requirements that most new homes in developments and individual homes would need solar panels installed.

He said the Sierra Club eventually agreed to not impose the requirements at individual homes and only for a percentage of new homes at multi-home developments.

“One major sticking point was the county couldn’t commit to taking action on [some of] these issues without a public hearing,” Nipp said of the negotiations.

As such, the Sierra Club agreed to let the county “consider” taking action on some of the settlement provisions.

What that means is the county agrees to hold public hearings on these ordinance changes and get public input before the Board of Supervisors vote on whether to approve them.

If they aren’t approved or if the items approved aren’t “substantially the same” as the ordinance amendments detailed in the settlement, the Sierra Club could opt to go court and ask a judge to compel the county to impose the changes, Nipp explained.

Rousseau said he isn’t worried about that happening, because the matters the county agreed to are reasonable.

In fact, Porterville officials were concerned that the county wouldn’t approve provisions of its settlement until county leaders did it.

“We have every intention of complying with the settlement agreement” with the Sierra Club, he said.

**Provisions of the settlement**

Here is a summary of the 11 provisions agreed upon by Tulare County in its settlement with the Kaweah-Kern chapter of the Sierra Club over changes to the county’s 2030 General Plan Update:

•Update the county’s climate action plan and inventory of greenhouse gas emissions. This would include determining the amount of greenhouse gasses emitted by county agencies and equipment.

•By the end of 2015, the county will release a draft Animal Confinement Facilities Plan Update, along with a Draft Environmental Impact Report and Climate Action Plan targeting greenhouse gas emissions associated with dairies suggesting ways to reduce those emissions.

•Consider within one year an amendment to the county’s Solar Installation Ordinance requiring that solar panels be installed on some new residential developments, based on the number of homes in each development.
In some cases, free-standing solar panel arrays could be built for groups of homes.

•Consider an ordinance restricting how long commercial, diesel trucks and other diesel vehicles can idle before they have to be driven away or turned off. The suggested ordinance would set a 5-minute idling limit, though there would be exceptions.
The suggested penalty for violating the ordinance is a minimum $300 fine.

•Consider adopting a resolution requiring the county to determine the effects new developments may have on groundwater recharge.

•The County will continue to replace its existing vehicle fleet with low-emission vehicles.

•Require developers for new construction projects to provide additional information related to base flood elevations. In cases where the county doesn’t have sufficient information for flood damage prevention reviews, the developers would be required to get that information at their own costs.

•The Board of Supervisors will recommend that the Flood Control Commission adopt policies to improve public input. This could include development of a suggestion form for the public to suggest flood-control projects and expanding the time the public has to review such projects.

•Consider an agricultural easement program to preserve prime farmland. In order to build on prime farmland, a developer would have to pay a fee to a land trust that would use the money to pay a farmer to agree not to develop an equal amount prime farmland.

•Set a policy that the county may require reasonable, additional actions to mitigate air pollution beyond what was required during the development if the county determines the effects on air quality are greater than previously estimated.

•Consider a resolution that development of a new town in the county will be considered through a comprehensive, transparent process that encourages informed public input.