

State of California  
**Air Resources Board**

**BOARD ITEM SUMMARY**

**ITEM # 20-7-6:      Public Meeting to Consider Proposed Research Contract with the University of California, Los Angeles Titled "Ambient Air Pollution and COVID-19 Disease Severity or Death among Confirmed Cases in Southern California"**

**STAFF RECOMMENDATION:**

The California Air Resources Board (CARB or Board) staff recommends that the Board approve funding of the proposed research contract with the University of California, Los Angeles Titled "Ambient Air Pollution and COVID-19 Disease Severity or Death among Confirmed Cases in Southern California."

**Note:** This item is listed on the agenda due to the contract amount and to comply with Board approval requirements in Government Code section 1091, since Board Member Balmes is affiliated with the University of California at Berkeley, where one of the researchers is also affiliated.

**DISCUSSION:**

The COVID-19 pandemic represents one of the largest threats to population health in more than a century. Biologically plausible reasons suggest that air pollution may make people more susceptible to contracting COVID-19, and once they have the disease, air pollution exposure may contribute to a worse prognosis. The objective of the study is to assess whether air pollution exposure lead to worse outcomes in confirmed COVID-19 cases among members of the Kaiser Permanente Southern California (KPSC) HMO. The wealth of individual information on the members of this cohort can help to determine the role of air pollution exposure in a worsening of COVID-19 disease including admission to hospital, admission to the ICU, advanced oxygen treatment or being put on a ventilator, and death in hospital. The individual information included in the health data will enable the investigators to examine whether exposure gradients along socioeconomic status, race, and ethnicity are partly responsible for a worse prognosis of some patient groups (e.g., non-whites) as well as examining the impacts of preexisting conditions. Contractors will use advanced land use regression exposure modeling to estimate ambient concentrations of several common air pollutants, including NO<sub>2</sub>, PM<sub>2.5</sub>, and O<sub>3</sub>. Contractors will also use chemical transport models (CTM) to estimate speciated fine and ultra-fine particles. These CTMs also enable researchers to examine specific sources of the particles and to link these estimates to all confirmed cases in the KPSC database. These data will be to assess whether higher chronic air pollution contributes to worse COVID-19 progression in diagnosed patients.

**SUMMARY AND IMPACTS:**

Given the high risk of death and serious debilitating complications that may result from COVID-19, it is critical to determine whether air pollution worsens the prognosis for patients infected with COVID-19, including residents in vulnerable and disadvantaged communities. Such findings are relevant to the mission of CARB to protect public health for all communities and provide additional support of the need for health protective air pollution standards in California. This work is also important to CARB because large portions of California, particularly in the Central Valley and the Southern California, continue to experience levels of air pollution that exceed California standards; thus these regions may be at higher risk of COVID-19 serious complications and death. The focus on other neighborhood and racial-ethnic susceptibilities may also supply important information on the environmental justice implications of COVID-19 and ambient air pollution exposures. Approximately \$608,000 is requested to fund this contract. Approval by the Board will authorize staff to put this contract in place to undertake the activities described in this proposal.