

# Improving Indoor Air Quality to Reduce COVID-19 Transmission, Improve Wellbeing, and Foster Economic and Social Activities in Doña Ana County

COVID-19 has wreaked havoc in Dona Ana County, causing death and disability, straining health-care and social services systems, and leading to economic and social disruption. The official count of COVID-19 deaths in Dona Ana County reached 769 on May 9, 2022; 63,511 cases have been reported in the county. In addition, the toll of disability left by Long COVID continues to rise, affecting up to 50 percent of people who have been infected. COVID-19 continues to spread, and case counts are once again rising.

SARS-CoV-2, the virus that causes COVID-19, is airborne – that is, the respiratory particles that contain the virus are so tiny that they remain in the air for hours or even days. While much attention has been paid to the potential for the virus to spread on surfaces (fomites) or respiratory droplets (which are larger and fall to the ground within a range of 6 feet), little has been paid to air as a transmission route. Yet COVID-19 is most often transmitted when someone inhales air that contains high concentrations of SARS-CoV-2. This most frequently occurs in poorly ventilated indoor environments.

## Indoor Air Quality and COVID-19

Indoor Air Quality (IAQ) is defined by the EPA as the “air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants<sup>4</sup>.” IAQ is affected by the presence of pollutants, viral illnesses, particulate matter, gases, and other substances.

Poor IAQ substantially increases the risk of COVID-19 transmission. In addition, poor IAQ has been linked to nausea, headache, skin irritation, asthma, cardiovascular disease, headache, poor cognitive performance, sick building syndrome, kidney failure, cancer, and other short- and long-term health consequences. Considering that people spend about 90 percent of their time indoors, poor IAQ poses an urgent public health problem.

## Improving Indoor Air Quality

There are two major strategies for improving IAQ:

1. **Ventilation**, which is the intentional introduction of outdoor air into a building to control air contaminants
2. **Filtration**, which is the removal of particles from the air by passing it through a filter

## Policy Actions

This policy brief proposes effective, evidence-based policy actions for improving indoor air quality in Doña Ana County. It is based on two premises: 1) indoor air quality is a direct determinant of health and wellness that affects all aspects of physical, mental, and cognitive health; and 2) Improving indoor air quality is a necessary step toward stemming the spread of COVID-19.

The goals of these recommendations are to:

1. Reduce the spread of COVID-19 while supporting economic, civic, and other social activities.
2. Improve overall health and wellness, especially for populations at most risk of poor health outcomes.

Abundant scientific literature provides the foundation for the following evidence-based policy recommendations for mitigating the spread of COVID-19 – and improving general health status – through improved IAQ. These interventions are widely available, effective, and affordable but must be applied broadly, at a societal level never seen before, to stem the spread of COVID-19.

## Recommendations

The Doña Ana Wellness Institute/Health Council requests the Doña Ana County Commission update the County's building and business codes to require all entities to adopt the practices described below to receive a permit to operate. This includes government, public and private K-12 schools, institutions of higher education, retail establishments, lodging establishments (including AirBnBs and other similar purveyors of lodging), theatres, museums, recreational facilities, and restaurants, health-care facilities, and any other space in which people share air space. These recommendations extend to public and private transportation services in which people share air space, inclusive of buses, taxi cabs, and ride-sharing services (e.g. Uber, Lyft).

Appropriate funding should be allocated to assure all businesses, agencies, and other affected entities can implement these measures.

1. **Inspection and Standards.** The county should follow indoor air quality standards developed by [ASHRAE \(2021\)](#) and require annual inspection by a certified HVAC professional to assure compliance with ASHRAE standards. All buildings used by the public, whether privately or publicly owned and operated, should be inspected and maintained yearly at a minimum. Minimum standards should include:
  - a. Ventilation: The measure of air changes per hour (ACH) is used to quantify air flow. All buildings should meet a minimum standard 6 ACH.
  - b. Filtration: Use of MERV 13 or better filtration, with professional maintenance on an annual basis and regularly scheduled maintenance performed by the organization.

- c. **Air Quality Monitoring:** Use continuous CO<sub>2</sub> monitoring to assure <1,000 ppm CO<sub>2</sub> or lower while people are present at the expected occupancy rate.
    - i. CO<sub>2</sub> monitoring should be required of all public and private businesses, government, and other indoor settings where people gather.
    - ii. CO<sub>2</sub> readings should be publicly available in real time
    - iii. CO<sub>2</sub> readings higher than 1,000 ppm must be mitigated immediately, and long-term mitigation measures put in place within 30 days.
- 2. **Certification.** All commercial indoor spaces should be required to publicly display air handling inspection certificate.
- 3. **HVAC.** All new buildings, including private residences, should be required to have mechanical ventilation (HVAC) systems installed and operational. Systems should be inspected at least yearly by a certified professional.
- 4. **Occupancy Rates.** Occupancy rates should be based on the ability to appropriately ventilate indoor spaces. As more people enter a room, the amount of “rebreathed air” – i.e., air that was in someone else’s lungs – increases. In the context of pandemic disease, that also means an increase in the risk of virus particles reaching infectious levels in that room.
- 5. **Rental Properties.** All rental properties should be held to standards for ventilation that maintain CO<sub>2</sub> levels at 1,000 ppm and air changes per hour (ACH) to 6 or more. This is especially important in shared housing such as apartments and condominiums.
- 6. **Transportation.** Vehicles should be considered indoor environments for the purposes of air quality. This includes public transportation, school buses, taxis and ride-shares (Uber, Lyft, etc.), government vehicles, public safety vehicles including law enforcement, fire, and ambulance, and company cars. At minimum, all occupants should wear high-quality respirator type masks, air should not be recirculated, and windows should be open when feasible. An active CO<sub>2</sub> monitor should be publicly displayed on all public transportation vehicles.
- 7. **Data and Information.** The county should initiate increased data collection and sharing of measures to assess airborne transmission, including information on masking, ventilation and aerosol-removal rates, number of occupants, and duration of exposure<sup>8</sup>. It should also advocate for these measures at state and federal levels.
- 8. **Educate.** Indoor air quality regulations should be accompanied by health-literate education of all residents, including business owners, residents, employees, and students, about aerosol transmission of disease and appropriate mitigation measures. These measures should include, at minimum:
  - a. **Masking:** People should be educated about why masking is so important in reducing the spread of COVID-19 *even in the context of adequate ventilation*. As feasible, the County should provide respiratory-type face masks (KN-95, KN-94, or N95) to all residents.

- b. **Ventilation:** Information and training should be widely available about the importance of ventilation, including low-cost strategies for improving ventilation (e.g. opening windows and properly placing fans).
- c. **Filtration:** Information and training should be widely available about the importance of air filtration, including instructions in why and how to build and use a “Do-It-Yourself” filtration device (i.e. Corsi-Rosenthal box)
- d. **Assessing Risk:** Different situations pose different risks, often not obvious. All residents should have easy access to information about risks, which can help them to make informed decisions.