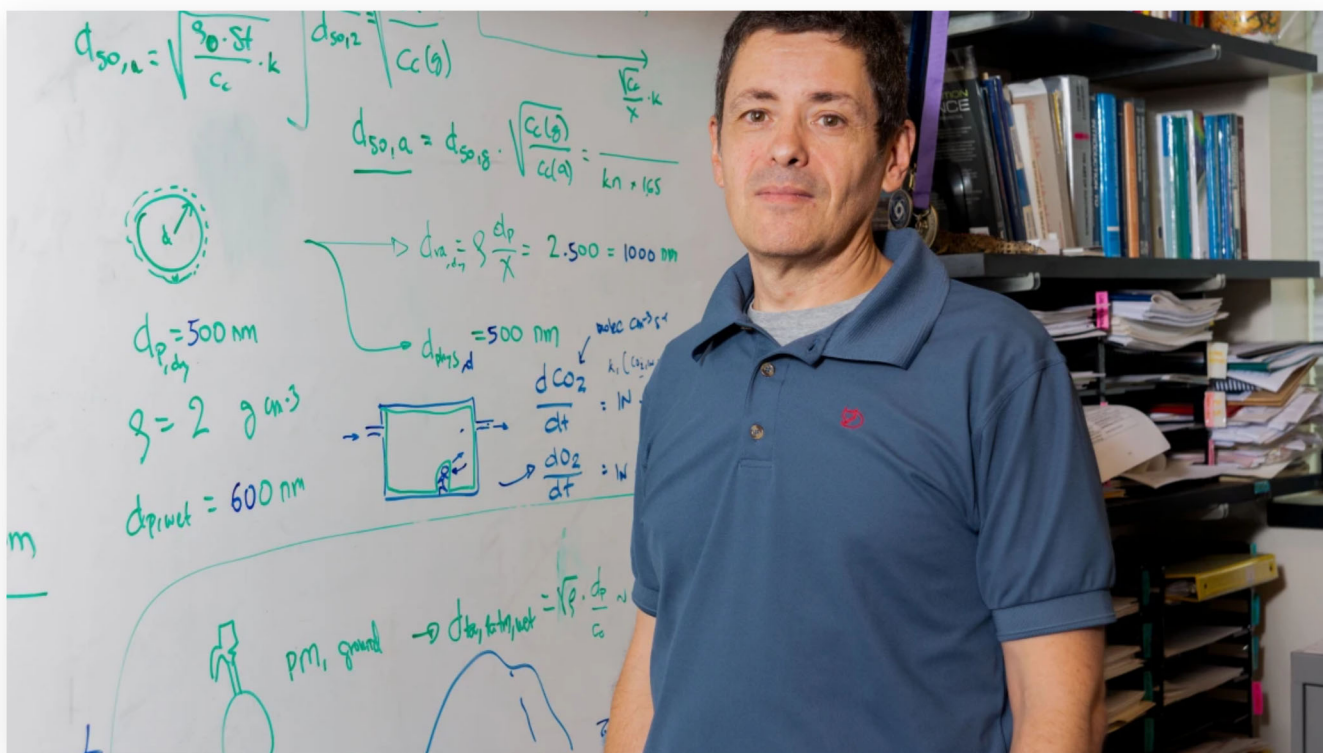


## CORONAVIRUS

# One Colorado scientist's uphill fight to convince the world that coronavirus spreads through the air

University of Colorado professor Jose-Luis Jimenez and several colleagues fought the conventional wisdom -- and changed how we think about viruses in the process

John Ingold 3:01 AM MDT on Jul 4, 2021



Jose-Luis Jimenez, chemistry professor and Cooperative Institute for Research in Environmental Sciences

(CIRES) Fellow. (Photo by Mariana Pereira)

**Credibility:**  Original Reporting  Sources Cited

**I**n March of last year, members of the Skagit Valley Chorale in Washington state gathered for their weekly rehearsal.

It was the early days of the coronavirus pandemic. The nation's first statewide stay-at-home order was still more than a week away, and chorale members rehearsed unmasked.

In the following days, 87% of those who attended the rehearsal contracted COVID-19 or were believed to have. Three were hospitalized. Two died.

One thousand miles away, in Boulder, a chemistry professor at the University of Colorado named Jose-Luis Jimenez read the news with alarm.

Jimenez is not a public health expert. His specialty is atmospheric chemistry — pollution, forest fire smoke, climate change. The title of one of the last journal articles he published prior to the pandemic was: “Ambient Quantification and Size Distributions for Organic Aerosol in Aerosol Mass Spectrometers with the New Capture Vaporizer.”

### COVID-19 IN COLORADO

The latest from the coronavirus outbreak in Colorado:

- **MAP**: Cases and deaths in Colorado.
- **TESTING**: Here's where to find a community testing site. The state is now encouraging anyone with symptoms to get tested.
- **VACCINE HOTLINE**: Get up-to-date information.

**>> FULL COVERAGE**

But, to Jimenez, the choir practice outbreak suggested that the world's

public health leaders were making a fatal mistake: They were wrong about how the coronavirus spreads.

“I reached out to my family and everyone who would listen and said, ‘This thing is moving through the air and I don’t know why they’re saying otherwise,’” Jimenez recalled.

Thus launched an unlikely campaign by public health outsiders, including Jimenez and a colleague at CU, to change decades of conventional thinking about how people transmit some of the most common viruses known to humanity, including SARS-CoV-2, the virus that causes COVID-19.

The fight finally paid off earlier this year, when both the World Health Organization and the U.S. Centers for Disease Control and Prevention belatedly acknowledged that aerosol transmission — which is transmission through the air — is a major way that the virus spreads.

But, to Jimenez, the fight goes on.

“This wasn’t about us being right,” he said. “This was about a pandemic that was spreading out of control, and we were basically telling people wrong information. The public health agencies were telling people wrong information. And that hasn’t fully been rectified.”





A coronavirus piñata at a vaccine event in Henderson on Feb. 26, 2021. (Jesse Paul, The Colorado Sun)

## A spat over spit

This is a story, ultimately, about spit — more precisely, the size of spit.

In March 2020, global health leaders all generally believed the same thing about SARS-CoV-2: It was spread through what is known as large-droplet transmission.

When people talk — or cough, or sneeze, or exhale, or sing — lots of microscopic spittle of various sizes comes flying out. In large-droplet transmission, the virus hides in the biggest globs of spit, which, because of their size, can't fly too far. Instead, they land on tabletops and door knobs and, perhaps, the faces of other people who are standing very close by. People touch those surfaces with their hands, then rub their eyes or wipe their noses and unwittingly usher the virus into their bodies.

This is how health experts have long believed other common viruses, such as the flu, are spread. And it gave rise to common recommendations for protecting yourself from COVID-19, such as sanitizing surfaces.

TODAY'S UNDERWRITER

That run on bleach wipes last spring? It was because everyone was told that SARS-CoV-2 spreads primarily through large-droplet transmission.

There's another way that viruses can spread, though, and it plays to Jimenez's and other atmospheric chemists' strong suit. Alongside the big droplets of spit that come flying out of mouths are tiny droplets called aerosols. They don't plop to Earth within a few feet. Instead, aerosols hang in the air for minutes at a time. They ride the wind.

Viruses that hide within aerosols can float through the air and be breathed in by the next person on the transmission chain. And it's possible they can jump between people standing farther than 6 feet apart — the oft repeated distance global health leaders have recommended for physical spacing to prevent spread. (Jimenez, however, believes keeping distance from others does help control coronavirus spread because it creates space for aerosols to disperse.)

Measles, tuberculosis and chickenpox all spread via aerosols, though Jimenez said health experts were slow to recognize airborne spread for all three of those pathogens. To him, the COVID-19 pandemic was history repeating itself.

In late-March 2020, less than three weeks after the Washington state choir practice, the World Health Organization posted a message on Twitter rejecting the idea that SARS-CoV-2 was spread through aerosols.

“FACT: #COVID19 is NOT airborne,” the tweet, which is still up, states. “The #coronavirus is mainly transmitted through droplets generated when an infected person coughs, sneezes or speaks.”

It is possible, of course, for viruses to spread through multiple methods. But it was reckless for world health leaders to so conclusively side with one method of transmission for SARS-CoV-2 to the exclusion of another, Jimenez said.

By denying the possibility of aerosol transmission, Jimenez believed the most influential voices in the pandemic were not giving people the information they needed to keep themselves safe. And they were also

allowing some important controls — like closing indoor dining at restaurants, where aerosols can built up and be recirculated through heating and cooling systems — to become politically controversial because people couldn't understand the need for them.

“In retrospect,” he said, “that’s one of the biggest errors in the entire history of public health.”



The City of Louisville has removed auto, but and bike traffic from a few blocks of Main Street to facilitate outdoor seating for local restaurants and to achieve safe social distance for people walking in downtown. (Dana Coffield, The Colorado Sun)

## Persuading global health experts

The campaign to persuade health experts that coronavirus is airborne began inauspiciously.

Jimenez connected with a number of other aerosols experts — researchers at universities across the globe. Together, they requested a meeting in early April with officials at the World Health Organization so that they could present evidence that the coronavirus spreads through the air. They discussed case reports of outbreaks — the choir practice, but also at restaurants and on cruise ships. They talked about the science of how long particles of various size can remain aloft in the air.

But, by the end, Jimenez said the meeting felt surreal. None of their evidence was taken seriously.

“There was an attitude of condescension, that they were superior and that they knew what was going on and that we didn’t,” Jimenez said.

The struggles continued.

When Jimenez and fellow CU professor Shelly Miller began working on a detailed study of the choir outbreak, they faced resistance from the local health department to help.

“Skagit County is not participating in your research,” the county’s public health director wrote in an email to Jimenez in early April. “Please understand that you do not have approval from Skagit County to conduct this research or affiliate us with your research. Please stop making these requests.”

A realization began to dawn about why it was so hard to convince people of something that seemed so obvious to him. Somehow, an orthodoxy had settled in the health world that respiratory viruses spread mostly through large-droplet transmission. That orthodoxy reached to the very top

TODAY’S UNDERWRITER

of global health leadership and all the way down to the local agencies directly responding to the pandemic.

Health scientists who tried to challenge that were often dismissed.

“I realized that they had been ridiculed and ignored for decades,” Jimenez said.

But he was an outsider. And, as an outsider, he and others in diverse fields of study could push harder.

By summer, Jimenez was working with other scientists on an open letter to the World Health Organization. The letter, titled “It Is Time to Address Airborne Transmission of Coronavirus Disease 2019 (COVID-19),” was signed by 239 scientists from 32 countries. The New York Times wrote an article.

Separately, Jimenez, Miller and others continued examining the Washington choir outbreak, working directly with the choir to gather needed information. Their subsequent article — “Transmission of SARS-CoV-2 by inhalation of respiratory aerosol in the Skagit Valley Chorale superspreading event” — led to another surge of media attention when it was published in September.

Gradually, public health advice began to change. Experts deemphasized the need to sanitize surfaces. They began to talk more about the need for proper ventilation — which helps disperse aerosols.

The intellectual battle was won. So why weren’t the world’s leading health agencies acknowledging that?



Due to the COVID-19 pandemic, a sign is posted on the window asking customers to please wear a mask inside the Hope Tank social enterprise gift store on Broadway on April 6, 2021 in Denver, Colorado. (Kathryn Scott, Special to The Colorado Sun)

## Aerosol acknowledgement

In late September, the CDC posted guidance on its website saying that the coronavirus spreads frequently through the air. Days later, it pulled that guidance down, saying the information had been posted in error.

To Jimenez, this made the agency's mistake about how the virus spreads even worse because it potentially undermined the measures that needed to be taken to slow the virus' spread.

“What we’ve seen is if you tell people what they have to do without explaining why they have to do it, it creates all these arguments,” Jimenez said.

Eventually, though, the big health authorities came around. This spring,

both the WHO and the CDC updated guidance on coronavirus to say that aerosol transmission is a major method of spread.

Jimenez was still irked.

“There is some relief that we have made progress,” he said. “But at the same time, there’s such frustration that there is still resistance.”

Now, he hopes to turn attention to other respiratory viruses like the flu — diseases where Jimenez believes health authorities may be making the same mistakes they made with coronavirus. He said he can’t stop at just coronavirus. If more viruses than previously thought are airborne, it means there need to be changes to longstanding public health protocols, there needs to be new messaging about how to keep people safe, there needs to be a greater stockpile of super-protective N95 masks.

“A year ago, I thought I was going to help for a few months and the evidence was so obvious that I wouldn’t be needed anymore,” Jimenez said.

He chuckled at that thought, seemingly so distant now.

“But that hasn’t been the case.”

**CORRECTION:** *This story was updated at 8:15 a.m. on July 5, 2021, to clarify that tuberculosis is caused by a bacterium, not a virus.*



**THE COLORADO SUN  
DOESN'T HAVE  
A PAYWALL...**



**...BUT THAT MEANS  
WE  
NEED  
YOU!**



**We believe vital information needs to be seen** by the people impacted, whether