

Coronavirus 101

A university learns how
to adapt to a pandemic.

BY CHIP MINTY

There are many places where University of Oklahoma students could be infected with COVID-19, but the classroom is not likely one of them, says Dr. Dale Bratzler, OU's chief COVID officer and a nationally known authority on infectious diseases.

OU doctors and researchers have been mobilized against COVID-19 since the pandemic reached U.S. shores last January, and two members of the OU Health Sciences Center faculty are at the center of the fight.



Travis Caperton

An OU freshman joins hundreds of new Sooners during the Class of 2024 Kickoff at Gaylord Family Oklahoma Memorial Stadium while maintaining social distancing.

Bratzler is working to keep OU's massive family of students, faculty and staff safe from the disease, while George Lynn Cross Research Professor William Hildebrand is leading a team of researchers in the race to develop a vaccine.

Despite protests from concerned students and faculty as the semester began, 65-year-old Bratzler says he has no apprehension about teaching his classes this fall on the OU Health Sciences Center campus in Oklahoma City or on the main campus in Norman.

"The classroom doesn't scare me," he says. "We've spent millions of dollars to make the campus and classrooms safer. I'm not concerned about the classrooms. That's not where we're seeing transmission. But I can't control what students do after hours or off campus.

"It's going out to eat. It's going to a bar; it's going to a par-

ty or any large gathering where people aren't wearing masks. That's where people get infected," he says.

Those are the concerns Bratzler had when the fall semester began in August, and those are the things he is seeing now that the semester is under way.

A professor and chair of the Department of Health Administration and Policy in OU's Hudson College of Public Health, Bratzler is coordinating COVID protocol in Norman, Oklahoma City and Tulsa after all three campuses were shut down due to the pandemic last spring.

Testing, tracing and such social measures as distancing and isolation have been a major focus for him since the OU Health Sciences Center began taking action early this year. The university was the first in the state and one of the first in the nation to begin ringing alarm bells over the outbreak



William Conover/OU Daily

The Sooners' home opener against Missouri State signaled that some students weren't following mask and social-distancing guidelines outside of the classroom. OU's Athletic Department enacted stronger guidelines by the next game.

after watching it ignite in China late last year.

Bratzler and his colleagues began monitoring the situation in December as part of Oklahoma's Special Pathogen Preparedness Operations Team (SPPOT). OU followed SPPOT recommendations on protective social measures and guidelines for the August return of in-person classes and on-campus living after curtailing such activities in March.

Bratzler was also on the team advising an end to fall in-person instruction after Thanksgiving and extending winter break to Jan. 25 to help mitigate the possibility of a campus resurgence of the virus after holiday travel.

Today, Bratzler is focusing much of his attention on limiting the spread of the virus among a student population that has demonstrated a propensity to disregard mask and social-distancing mandates. As part of this ongoing effort, OU initiated two proactive measures in early September to help intercept asymptomatic infections, Bratzler says.

One is a regular sampling of wastewater from across campus, including residence halls. Because infected people shed the virus in their waste before developing symptoms, health officials can provide the university an early warning of an uptick in positive cases by analyzing wastewater. This is especially helpful in densely populated areas, like residence halls, where the disease can spread quickly.

Another proactive measure is a voluntary COVID-19 testing program for residential students who do not show symp-

toms. About 25% of all students living in OU housing were invited by e-mail to participate in the free testing program even if they were showing no signs of the virus.

"By testing a representative sample of students who are asymptomatic, we can better pinpoint the presence of the virus and limit its transmission," says Bratzler.

If a student believes they have been exposed to someone with the virus, they are generally instructed to quarantine in their permanent room assignment, says Dean of Students David Surratt. They are allowed to leave their residence to pick up meals if they wear a mask and social distance.

If a student tests positive for COVID-19, it is usually recommended they isolate in university-provided housing rather than return home and risk spreading the virus further. Students receive an "isolation kit," which includes a thermometer, water and snacks, with meals delivered twice daily and breakfast items stocked in each isolation space.

Many students are surprised to learn that the Centers for Disease Control recommends an isolation period of 10, not 14, days and that it is not necessary to be retested, Bratzler says.

"The CDC recommends against testing for a negative," he says. "Multiple studies have shown that if you had a positive test today, 10 days from now, we wouldn't be able to culture the virus from you, even though your test may still be positive. The test is very sensitive, and we can pick up viral fragments for weeks to come."

That's one example of an issue where there is a lot of anxiety.



Dr. Dale Bratzler, seen here during a virtual press conference, is both the public face of OU's COVID-19 response and the architect of the university's pandemic protocol.

ety among faculty members, who may have learned they have a student who has tested positive.

"They're wondering, 'What do I need to do now? Do I need to cancel class? When can I let them back in the classroom?' So, we're trying to lay out some of that guidance because it has been one of the areas of concern," Bratzler says.

While Bratzler continues his work to minimize risk on campuses this fall, OUHSC colleague William Hildebrand attacks from a different front, leading a team of researchers developing a vaccine to help eradicate the disease.

Hildebrand, a professor in the Department of Microbiology and Immunology, has been collaborating with an Austin, Texas, biotechnology company since March to study the novel characteristics of COVID-19 and customize a vaccine against it.

Hildebrand's lab is among many around the world working on an assortment of COVID-19 vaccines, using a variety of approaches and technologies. While a few development projects are moving through the final stages of testing and could soon emerge from trials and begin distribution, Hildebrand says his process is taking longer.

"We set out to specifically study COVID-19, so we didn't use data from previous viruses like SARS or data from previous studies of other pathogens," he says. "We studied COVID-19 to identify, 'How does your immune system target COVID-19?'"

Before building a vaccine, Hildebrand says, it's important

to determine how the immune system targets the specific virus. Then a vaccine can be built from the ground up with that knowledge.

"It's a process that can take a long time, and not many have the patience for that right now," he says.

COVID-19 is a virus within the coronavirus family. When comparing such viruses at the genetic level, they are similar, with some studies indicating they are 97 to 98% the same, Hildebrand says.

Because of the similarities, most scientists are developing vaccines based on what they have learned about coronaviruses in the past, especially SARS, which caused a smaller-scale pandemic

in 2003. Although the earlier SARS is not COVID-19, the two are very close relatives and vaccine developers believe they have similar vulnerabilities that can be targeted.

"It's logical, it seems to make sense and it may work," Hildebrand says. "We instead studied COVID-19 specifically for the first three or four months, differentiating it from its relatives and family members. When we build a vaccine, we will use information specific to COVID-19."

Hildebrand believes his method can facilitate development of a vaccine that targets weaknesses more precisely and works more effectively.

Even though Hildebrand's project will not be the first to produce a vaccine, he says his team's work has a long-term role to play. In the event that the first vaccines do not meet the desired level of effectiveness, their vaccine could be available, ready to backfill and perhaps augment earlier vaccines.

The first vaccine to be developed is not necessarily going to be the best vaccine, he says, and there is a precedent for that.

"The first polio vaccine came out in 1954. Jonas Salk gave us that. It was revolutionary, but in 1960 (Albert) Sabin came out with the Sabin polio vaccine," Hildebrand says. "The first vaccine by Jonas Salk was an incredible development, but the vaccine of choice ultimately became Sabin's vaccine."

Similar to the world's 1950s fight against polio, there is a race to develop and distribute a vaccine to fight COVID-19, Hildebrand says, adding that the first generation of COVID-19 vaccines are based on what we knew of the virus



Travis Caperton



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OU George Lynn Cross Research Professor Dr. William Hildebrand is collaborating with a biotechnology company to develop a vaccine that targets the specific vulnerabilities of COVID-19.

in March, April and May of this year. These were the first to enter the testing stage.

In the past six months much has been learned about the virus, and much continues to be learned at a fantastic pace. He believes there will be a second and third generation of vaccines, as well. “I’d say ours would be a second generation,” he says.

Once vaccine development projects enter the trial stage, testing follows a rigorous course comprising three phases monitored by the U.S. Food and Drug Administration. Hildebrand’s project has not yet entered the first phase of vaccine trials, which focuses on animal testing. Following successful completion of the animal-testing process, phase one moves on to testing with a limited number of people, up to perhaps 50 participants.

Phase-two testing involves as many as 1,000 people. They are tracked and monitored for potential risks and adverse reactions. Researchers determine optimal dosages to learn what is safe while still creating the greatest immune response.

If given approval for advancement, studies move on to

Opposite top Nick LoLordo, a lecturer in OU’s Expository Writing Program, teaches students in a tented outdoor classroom.

Opposite left Students social distance auditorium style in the OU School of Music under the direction of graduate teaching assistant Ruben Alcalá.

phase-three trials, which can involve tens of thousands of people who receive the vaccine or a placebo, Hildebrand says. Researchers track them to determine if those receiving the vaccine have significantly lower rates of COVID-19 infection than people who were given a placebo.

“That’s where several vaccines are now,” he says. “Some, like Moderna, are in phase three, and some people in Oklahoma City have been vaccinated with either the Moderna vaccine or a placebo. Now they’re out in the population and we’ll find out how they do in regard to testing positive or not for COVID-19.”

OU COVID Officer Bratzler is hoping there will be a vaccine in production by next year so the

medical community can start administering it to the most vulnerable. While children and young people can contract COVID-19 and spread it, the chances for that are lower, and they are not as likely to end up in the hospital, Bratzler says.

Meanwhile, he points to a recent CDC study showing that 94% of patients who have died from COVID-19 had other health conditions and contributing causes. Perhaps priority populations for vaccinations will be the elderly and those with comorbidities like heart disease, diabetes, chronic lung disease and kidney disease, he says.

“It’s not students who are going to have complications, most commonly,” Bratzler says. “It’s the older people or the people around them who have chronic diseases, immune suppression, cancer and things like that.”

Regardless, OU students must continue to be cautious and avoid risks, he says.

“I’m disheartened every time I hear about some student who tests positive or hear about an outbreak that might be tied to some event,” Bratzler says. “That’s perhaps my greatest frustration. These are smart individuals who are coming to college, but they’re sometimes putting themselves into circumstances that put them at risk of getting the infection.

“That’s where we are right now. We just can’t let our guard down.”

Chip Minty is a Norman-based writer and the principal of Minty Communications, LLC.