

## How a Premier U.S. Drug Company Became a Virus 'Super Spreader'

Biogen employees unwittingly spread the coronavirus from Massachusetts to Indiana, Tennessee and North Carolina.

By Farah Stockman and Kim Barker

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BOSTON — On the first Monday in March, Michel Vounatsos, chief executive of the drug company Biogen, appeared in good spirits. The company's new Alzheimer's drug was showing promise after years of setbacks. Revenues had never been higher.

Onstage at an elite health care conference in Boston, Mr. Vounatsos touted the drug's "remarkable journey." Asked if the coronavirus that was ravaging China would disrupt supply chains and upend the company's big plans, Mr. Vounatsos said no.

"So far, so good," he said.

But even as he spoke, the virus was already silently spreading among Biogen's senior executives, who did not know they had been infected days earlier at the company's annual leadership meeting.

Biogen employees, most feeling healthy, boarded planes full of passengers. They drove home to their families. And they carried the virus to at least six states, the District of Columbia and three countries, outstripping the ability of local public health officials to trace the spread.

The Biogen meeting was one of the earliest examples in the United States of what epidemiologists call "superspreading events" of Covid-19, where a small gathering of people leads to a huge number of infections. Unlike the most infamous clusters of cases stemming from a nursing home outside Seattle or a 40th birthday party in Connecticut, the Biogen cluster happened at a meeting of top health care professionals whose job it was to fight disease, not spread it.

"The smartest people in health care and drug development — and they were completely oblivious to the biggest thing that was about to shatter their world," said John Carroll, editor of Endpoints News, which covers the biotech industry.

The official count of those sickened — 99, including employees and their contacts, according to the Massachusetts Department of Public Health — includes only those who live in that state. The true number across the United States is certainly higher. The first two cases in Indiana were Biogen executives. So was the first known case in Tennessee, and six of the earliest cases in North Carolina.

All the people outside Massachusetts whom The New York Times has connected to the cluster have recovered. But it's impossible to say for certain whether anyone became gravely ill or died from the spread out of the conference.

In hindsight, many people have criticized Biogen's decision to continue with its leadership meeting in late February, which was attended by vice presidents from European countries already hit by the virus. Others in the industry fault Biogen for being too tight-lipped about the outbreak.

At least two of the company's senior executives have tested positive. Citing privacy concerns, the company has declined to name them, even as other chief executives in biotech have disclosed their positive tests.

Responding to questions from The Times, Mr. Vounatsos refused to say even whether he had been tested for Covid-19.

"He is completely focused on employee safety, supplying medicines to patients, and leading the company," said a Biogen spokesman, David Caouette. "This takes precedence over his personal health status."

The company has defended its handling of the leadership meeting and its aftermath, saying it made the best decisions it could with the information available at the time.

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“For a company whose mission is to save lives, it was very difficult to see our colleagues and community directly affected by this disease,” Mr. Vounatsos said in his first public comments about what happened at Biogen. “We would never have knowingly put anyone at risk.”

Founded in 1978 and based near Boston, Biogen helped pioneer the biotechnology industry, specializing in multiple sclerosis drugs. The company is best known now for its work on a promising treatment for Alzheimer’s.

Its experimental drug was seen as a potential holy grail — until the company announced about a year ago that the drug appeared to be a failure in large-scale trials. Patients were devastated. The company’s stock nose-dived.

But last fall, in a stunning reversal, Biogen announced that further analysis of the data suggested the drug actually worked at higher doses. Mr. Vounatsos said the company planned to seek approval from the Food and Drug Administration “as soon as possible.” The stock soared; the company pulled in record annual revenues of about \$14.4 billion.

By the time of Biogen’s annual leadership meeting on Feb. 26 and 27, spirits were high. So was the pressure to deliver.

Although some other companies canceled international meetings around that time, Biogen never discussed doing so. The outbreak was raging in China but had not yet been declared a worldwide pandemic. As of Feb. 21, the Friday before the meeting, the United States had only 30 confirmed cases, according to data compiled by The Times. Biogen executives in Germany, Switzerland and Italy — where there were just 20 known cases — packed their bags.

On the first night, about 175 executives gathered for a buffet dinner and cocktails at the Marriott Long Wharf overlooking Boston Harbor. Colleagues who hadn’t seen each other in a year shook hands and vied for face time with bosses. Europeans gave customary kisses on both cheeks.

“It’s unfortunately the perfect breeding ground for a virus,” said one former vice president, who spoke on condition of anonymity because of his ties to Biogen.

Two days later, the senior executives returned to their offices. One drove to a manufacturing center in North Carolina. Others flew back to Europe.

Peter Bergethon, the head of digital and quantitative medicine at Biogen, went home to his wife, an infectious-disease doctor.

A Biogen vice president in the Alzheimer’s franchise and her husband attended a party the following Saturday night at a friend’s home in Princeton, N.J., with about 45 other people.

They celebrated a holiday in the Greek Orthodox calendar, the end of the Carnival season, with special sweets and traditional dances that involved holding hands in a circle. Although celebrations in Greece had been canceled, the party in New Jersey went forward, since White House officials had just pronounced the virus in the United States to be under control.

That night, Allana Taranto, a photographer who covered the leadership meeting for Biogen, celebrated her 42nd birthday with her boyfriend and another couple.

Over that weekend, though, some people in the company had already started feeling sick.

Jie Li, a 37-year-old biostatistician who worked on the Alzheimer’s drug team, had chills, a cough and aches. She was too junior to attend the company’s leadership conference, but her boss went, and showed up at the office afterward.

On March 2, the following Monday, the company’s chief medical officer sent an email informing everyone who attended the leadership meeting that some people had fallen ill and telling them to contact a health care provider if they felt sick.

“We moved quickly,” Mr. Caouette said.

Still, that same day, the company’s four top executives attended a huge health care conference hosted by the investment firm Cowen. At another Marriott in Boston, they held meetings in hotel rooms with potential investors. Another attendee who met some of the same investors said he heard that members of the Biogen team looked sick.

At the conference, concern about the coronavirus mounted as word spread that some companies, including Vertex and Seattle Genetics, had canceled their appearances. By Tuesday, the second day of the conference, many attendees had stopped shaking hands.

Later, investors were informed that two of the four Biogen executives at the conference tested positive for the virus.

In defense of his company’s decision to attend the event, Mr. Vounatsos said, “When we learned a number of our colleagues were ill, we did not know the cause was Covid-19.”

That Tuesday, Biogen contacted the Massachusetts Department of Public Health and reported that about 50 employees in the Boston area and overseas had flulike symptoms. Biogen employees began showing up at the emergency room of Massachusetts General Hospital, demanding tests. They were told their cases didn’t satisfy the testing criteria at the time, since none had traveled to a hot spot or had known exposure to someone who had tested positive for Covid-19.

The next day, confirmation of the worst arrived. Two Biogen executives who had returned home to Germany and Switzerland, where tests were more widely available, had tested positive.

On Thursday, the company held a call with its staff and shared the news. All office-based employees were directed to work from home.

Yet on that same day, a Biogen executive visited the Washington office of Pharmaceutical Research and Manufacturers of America, or PhRMA, the industry's top lobbying group. Soon after, that executive tested positive, prompting the group to close its headquarters for deep cleaning.

The next few weeks turned into a blur of Biogen employees leaving casseroles on one another's doorsteps and trading news about who had fallen ill.

Dr. Bergethon infected his wife, the infectious-disease specialist. While their symptoms were manageable, the scariest part was the uncertainty, Dr. Bergethon recalled recently at a virtual event hosted by the University of Rochester.

"We didn't know we were going to recover," he said. "We didn't know what was coming next."

Ms. Taranto, the photographer who had been at Biogen's leadership conference, unknowingly gave the illness to a friend at her birthday dinner. She had felt healthy at the time.

Of the four dozen people who attended the party in New Jersey, at least 15 later tested positive, according to public health authorities.

A Biogen executive, Chris Baumgartner, became the first Covid case in Tennessee. "I was patient zero," he wrote on Facebook. He added: "Imagine having to confront a virus so feared, it now has the entire world on the brink of mass hysteria."

The earliest cases in Indiana and North Carolina were tied to the company. One Biogen employee even carried the virus back to China.

After falling ill with flu-like symptoms, Ms. Li called an ambulance and was given a coronavirus test, according to a public health official in Belmont, the upscale Boston suburb where she lived. But before she received the results, she booked a flight to Beijing, boarding a plane with her husband and son, leaving behind their house, a white BMW and other trappings of the life they had built in the United States over 15 years.

"They must have been desperate," said Dr. William Q. Meeker, a statistics professor at Iowa State University who had worked closely with Ms. Li's husband, Yili Hong, also a statistician. The couple worried most about their 2-year-old, who would be far from relatives if they both fell ill, according to a former graduate school classmate.

Ms. Li took medicine to conceal her symptoms, and revealed her health condition to flight attendants on board the flight, Air China and Beijing disease control officials said last month.

After she landed in China, authorities placed her under investigation for "obstructing the prevention of infectious diseases," a crime that reportedly carries a sentence of up to seven years in prison.

In Beijing, the couple suffered from high fevers and lung infections and were hospitalized, Dr. Meeker said. He recently received an email from Mr. Hong that said they were recuperating, but that their lives "will be different in the future."

It appears that all of Biogen's employees who fell ill have recovered. Aside from Ms. Li, who was fired, all have returned to work, Mr. Caouette said.

Biogen has since joined the fight against the virus. The company donated \$10 million to expand access to testing and to provide emergency food and protective gear for hospital workers.

Company officials said its struggle against the pandemic is just beginning: Biogen, for instance, has also entered into talks with Vir Technology about manufacturing a potential treatment for Covid-19, another pharmaceutical holy grail that could make untold amounts of money.

Serge Kovalski, Jeffrey E. Singer and Susan Beachy contributed from New York. Austin Ramzy contributed from Hong Kong.

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#### ● When will this end?

This is a difficult question, because a lot depends on how well the virus is contained. A better question might be: "How will we know when to reopen the country?" In an American Enterprise Institute report, Scott Gottlieb, Caitlin Rivers, Mark B. McClellan, Lauren Silvis and Crystal Watson staked out four goal posts for recovery: Hospitals in the state must be able to safely treat all patients requiring hospitalization, without resorting to crisis standards of care;

the state needs to be able to at least test everyone who has symptoms; the state is able to conduct monitoring of confirmed cases and contacts; and there must be a sustained reduction in cases for at least 14 days.

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