

## **BAD BLOOD: THE FINAL CHAPTER**

### **EPIISODE 2: EBOLA**

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**Barack Obama:** Thousands of men, women and children have died. Thousands more are infected. If unchecked, this epidemic could kill hundreds of thousands of people in the coming months. Hundreds of thousands.

**When President Obama spoke these words at the United Nations in 2014, an epidemic of the deadly Ebola virus was raging in West Africa. A small outbreak that had begun in the forested region of southeastern Guinea had spread to five neighboring countries. The situation on the ground was grim. Hospitals were overrun. Patients were dying in the streets from massive internal hemorrhages. Entire families were being wiped out. Fears that the virus would spread to other parts of Africa and beyond were mounting.**

**Barack Obama:** One health worker in Sierra Leone compared fighting this outbreak to fighting a forest fire with spray bottles. But with our help, they can put out the blaze.

**The “help” Obama was referring to was coming in part from the Centers for Disease Control and Prevention, which was leading the international response to the outbreak. Just like in the current coronavirus pandemic, the key to the CDC’s response was testing.**

**The early symptoms of an Ebola infection—a high fever, a bad headache and weakness—can easily be mistaken with other tropical**

diseases like malaria or typhoid fever. The only thing that can tell them apart before Ebola ravages the body is an accurate test.

Properly diagnosing a patient during this early phase of infection is often the difference between life and death, says Dr. Marie-Roseline Bélizaire, an epidemiologist at the World Health Organization who has treated Ebola patients in Africa.

**Marie-Roseline Bélizaire:** If this person is getting testing during the first days... This person has more than 90% of probability to be cured.

So, an early test gives the patient a great chance of making it. But if the diagnosis comes after the fifth day of illness... when the internal bleeding has begun...

**Marie-Roseline Bélizaire:** The probability to save this person is very, very low. We can say five percent of probability.

Not only has it become too late to save the patient... the patient has become highly infectious.

Enter *Elizabeth Holmes*. She'd just been featured on the cover of Fortune magazine and was fast becoming a Silicon Valley darling. That spring, she'd approached Tom Frieden, the Director of the CDC,

and told him that Theranos had developed a fast and highly accurate Ebola test that required just a few drops of blood pricked from a finger.

The CDC already had an Ebola test, but it was a slow process. Patients often had to travel long distances to field laboratories, where tubes of blood would be drawn from their arms. Between the moment they started to show symptoms and the moment they got their diagnosis, several days could go by. That gave the virus the chance to keep spreading.

What Elizabeth was dangling was the Holy Grail: a fast, reliable test that could be performed on the spot where the patient lived and with much less blood.

By the time Obama spoke at the UN in late September of 2014, Elizabeth had met with Frieden twice. Once at a conference in Aspen, Colorado that June and a second time at Theranos' offices in Palo Alto in July while the CDC director was in town to visit family. On both occasions, she talked up her test's *unmatched* advantages.

She also mentioned it to a prospective investor. Actually... "mentioned it" is a big understatement. She *repeatedly* touted it to this prospective investor. She and Theranos President Sunny Balwani told the investor Theranos was on the cusp of getting the test approved by the FDA and of securing a big contract from the U.S. government. They claimed Theranos' Ebola test would soon be

deployed in West Africa and at U.S. airports to screen travelers arriving from the region.

Now that we've lived through a pandemic that has claimed millions of lives, we know firsthand how a public health crisis can be exploited by amoral people. After all, unknown contractors of dubious origins were awarded hundreds of millions of dollars in PPE contracts by the Trump administration. One startup in southern California became one of the U.S.'s biggest providers of Covid testing by marketing a spit test that the FDA later said was defective. Epidemics and the panic they stoke are breeding grounds for fraud.

I'm John Carreyrou and this is *Bad Blood: The Final Chapter*. Today... the untold story of how Elizabeth Holmes tried to capitalize on the Ebola epidemic to land a big investment. She made bold promises about Theranos' ability to test for the deadly virus.

But there was a yawning gap between her promises... and *the truth*.

PREROLL BREAK

SEG A

It's easy to forget how close we came to a devastating outbreak in 2014. To give you some perspective, the Covid-19 mortality rate in the US is thought to be somewhere between 1% and 2%. But the average death rate from Ebola?... It's about 50%...

**Thomas Frieden:** Today, we are providing the information that an individual traveling from Liberia has been diagnosed with Ebola in the United States.

**Just five days had passed since President Obama's speech at the UN and, suddenly, the calculus had changed. Ebola had arrived on U.S. shores.**

**Thomas Frieden:** This individual was admitted to a hospital in Texas and placed on isolation. It is certainly possible that someone who had contact with this individual, a family member or other individual, could develop Ebola in the coming weeks.

**When Tom Frieden, the CDC director, broke the news from the agency's headquarters in Atlanta, Americans who had tuned out the outbreak in Africa were stunned. In Dallas, where the infected man was hospitalized, a frenzied search began to identify who he'd been in contact with. Within days, the man had died and two healthcare workers who cared for him were reported to be infected. Panic gripped the country. Some people started wearing surgical masks in public.**

**At Theranos headquarters in Palo Alto, Elizabeth rallied her staff. A group of biochemists had already been working on an Ebola test for several months, but now she ordered all hands on deck. Work on everything else was dropped. Ebola was suddenly all Elizabeth cared about.**

**Tom Brumett:** Just out of the blue, you know, she gets everybody whipped up on this thing.

**That's Tom Brumett, an engineer who worked at Theranos from 2010 to 2017. During his time at the company, Tom kept a journal to document the crazy things he witnessed on a nearly weekly basis. He shared that journal with me. An entry from October 2014 reads: "Elizabeth has got Theranos working day and night to prepare to send blood test machines to Africa. Elizabeth met with me and about 10 other system developers to push us to make a few changes so the machine can better detect Ebola and work in the Africa environment. She said CDC came to visit on Friday to ask our help..."**

**Tom Brumett:** Yeah that's what she was saying... Biden called and said, you know, go for it and all this other kind of stuff.

**That's... Joe Biden, who was Vice President at the time...**

**Elizabeth wasn't racing to make an Ebola test out of the kindness of her heart. She and Sunny sensed an opportunity. An Ebola fingerstick test would be a great marketing tool; it would show people how useful and relevant Theranos' technology was. There was one audience they wanted to impress in particular: prospective investors.**

**At the time... in the fall of 2014... Elizabeth was courting big investors. *Really big* investors. The sort of investors that could bring Theranos into a different stratosphere. If everything went well, these people were ready to invest as much as 850 million *dollars*—a huge sum that would dwarf the amount the ten-year-old company had raised up to that point.**

**This pot of gold would come from a Chicago merchant bank called BDT Capital Partners and a group of co-investors that could include Warren Buffett's Berkshire Hathaway. To get it, Elizabeth would have to sway BDT chairman Byron Trott, a financial whiz who'd been hailed as the "billionaires' banker." If Trott invested in Theranos, he might bring Buffett, one of the richest men in America, along too. It would vault Theranos into the big leagues.**

**On October 11, 2014, Trott and three of his colleagues flew to California and had a meeting with Elizabeth and Sunny at Theranos' offices in Palo Alto. According to BDT's notes of the meeting, Elizabeth said Theranos' Ebola fingerstick test had several big advantages over competing tests: it would prevent poorly trained medical workers in Africa from accidentally sticking themselves with needles (which sounds like something someone from Palo Alto who'd never set foot in Africa would say); it could detect the virus just three days after infection, allowing patients to be diagnosed before they became sick; and it took only 22 minutes to complete.**

**Sunny revealed something else: Theranos was negotiating a \$120 million government contract. Under this contract, it would deploy the test in West Africa and at U.S. airports to screen travelers arriving from the region. Their goal, Elizabeth and Sunny said, was to establish Theranos as "a pandemic leader."**

**Although these were big claims, Trott and BDT didn't have any reason to doubt them. Elizabeth and Sunny sounded extremely confident. They seemed to have it all figured out. But behind the scenes, it was a different story...**

## **BEAT**

**John Carreyrou:** What would your reaction have been if you had been in the room where Elizabeth, you know, was telling this one investor, Byron Trott, that they were about to land this big government contract for the Ebola test and they were going to start deploying devices to test for Ebola at airports? Yeah, no I... I would have rolled my eyes, I guess... I would have been like covering my face. Like maybe what Dr. Fauci did when Trump, you know remember, he said that to put bleach in people's blood to... to like cure them of Covid. Like kind of like that. Like, oh, my God, what... what are you talking about?

**Lina Castro was a member of Theranos' clinical laboratory, which tested blood samples drawn from patients in Walgreens stores. Before joining Theranos, she'd worked for the city of San Francisco as a public health microbiologist for eight years. Infectious diseases were her specialty. And based on what she'd seen, Theranos' clinical lab was completely unprepared to handle them.**

**Lina Castro:** They were not following safety protocols, so no one was wearing a lab coat. There were blood stains all over the laboratory.

**It might sound like a small thing, but if you're a microbiologist, you are *fanatical* about having a clean workspace to minimize the chance of contaminating the samples you're testing. You want your lab to shine like the top of the Chrysler building. But when Lina looked around her, what she saw... was a mess.**



**Lina Castro:** We use these wipies--kind of like baby wipes but they're for... they're disinfectants. And then the container had a blood splatter on the side. And I was like, ew, so I just took it and threw it on the garbage. And then I left the lab and then I came back and somebody had taken it out of the garbage and put it back on the bench. And I was like, what? Like, what kind of training do these people have in blood-borne pathogens?

**Out of an abundance of caution, experienced laboratorians treat all blood samples they handle as if they were infected with hepatitis C, HIV or other dangerous pathogens and follow strict protocols when they discard them.**

**Lina Castro:** But then what I saw was they were just taking the tubes out of the instrument and just throwing them in a biohazard bag that was on the floor. But if you throw things, they tend to splatter. And so, they were like on the side of the instrument, there was blood. I remember we had a girl that actually had some fluids from one instrument splash in her eyes because she didn't have the proper PPE.

**No lab coats, no goggles, fluids spurting into people's eyes... This was a well-trained microbiologist's worst nightmare. So Lina made it her mission to fix the problem.**

**Lina Castro:** When I started I was like, OK, first of all, we're going to bleach this whole laboratory. So we bleached everything. All the benches, the freezers, refrigerators, the doorknobs. We got hooks to put on the walls so people can put their lab coats. Everybody got safety glasses to protect them from splatters.

**She also bought cheesy safety videos narrated by cartoon characters and showed them to her colleagues during their weekly lab meetings:**

**Lab scientist mom:** Lots of BL2 workers also get immunizations if they'll be working with certain agents.

**Boy:** I hate getting shots!

**So... when Theranos' focus suddenly shifted to Ebola ... Lina was understandably skeptical. To begin testing for the lethal virus in live patient samples, the company would have to equip the clinical lab with airlocks and a special air filtration system and she and her colleagues would have to start wearing hazmat suits and take decontamination showers. But before even doing any of that, Theranos had to develop a good test to detect Ebola. And to Lina, that was far from a given. Because... six months after being hired... she still hadn't seen one of Theranos' vaunted blood-testing machines.**

**Lina Castro:** I was not allowed because everything was very hush hush, right? Everything was need to know.

**Theranos actually had two labs: the clinical lab, which tested the patient samples collected at Walgreens; and a research and development lab. Up until then, Lina had only been granted access to the clinical lab. But now she was being asked to help out with an application Theranos was going to submit to the FDA. For the application, Theranos needed to run experiments with inactivated Ebola virus on its proprietary devices. This meant that for the first time... Lina would have access to the *R&D lab*... and to those mysterious machines.**

**It didn't exactly go as she imagined...**

**Lina Castro:** We went to Palo Alto to do some testing on the instrument that they were using and... we put the specimen into the white cartridge and then we would put it on the instrument and the instrument would crash. I mean, we were there for, like, I don't know, four or five hours and it would crash every single time.

**The “instrument” was the Theranos machine. Elizabeth had christened it “the miniLab.” It was a big black box that looked like a desktop computer tower. On its front, beneath a digital touchscreen with the green Theranos logo, there was a slot. When you wanted to test a blood sample, you placed it in a white rectangular cartridge and you pushed the cartridge into the slot, like a tape into a VCR.**

**Lina Castro:** It was always... the tape would get stuck, like the tape would not be able to get ejected. And so, we always had to, like, play with, like, tweezers and pliers and try to get the tape out and reset the instrument.

**The cartridge wasn't the only thing that got stuck. There was a robotic arm inside the machine that wielded a pipette. The arm moved the pipette around and the pipette sucked up liquids and mixed them with the blood sample. When it was done mixing, the pipette was supposed to shed its tip...**

**Lina Castro:** When it goes to discard the tip, the tip would get stuck. And so of course the instrument is like, excuse me, I can't do what I'm supposed to. You need to do something. So, user intervention. And so, we would go in with tweezers and just remove the tip so the instrument can restart. I, I mean, I'm laughing, but it's kind of terrifying.

**While Lina confronted the realities of working with the miniLab, Elizabeth and Sunny *continued* to tout Theranos' Ebola testing capabilities to BDT. Five days after their first meeting, Sunny had a**

call with three of the firm's executives. He told them Theranos was "30 days away" from announcing its big Ebola contract. He expected the U.S. government to pay at least \$50 million of the supposed \$120 million up front. He said one of the airports Theranos devices would be placed in was New York's JFK. Oh, and they were also working with USAID to launch Theranos' Ebola test in Liberia, he claimed.

Two weeks later, on October 28, 2014, Elizabeth had a call with Byron Trott. She told Trott Theranos' test could now detect Ebola when there were fewer than *five* copies of the virus per milliliter of blood. This would allow it to diagnose patients just one to two days after infection, before the onset of symptoms. No other test could detect the virus that early, she said. Infectious disease experts who'd evaluated the Theranos test were calling its accuracy "phenomenal," she added. The company had applied to the FDA for emergency-use approval the previous day, and she expected the agency to fast-track the application.

There was just one problem... almost none of her claims were true.

BREAK 1  
SEG B

**Aaron Richardson:** And we would have these kinds of arguments where they would demand something that was like physically or mathematically impossible.

**That's Aaron Richardson, one of the scientists who led the development of Theranos' Ebola test. He's talking about the meetings he'd have with Elizabeth and Sunny and the unreasonable demands they would make. One particularly unreasonable demand had to do with Elizabeth's boast to Byron Trott. Her boast that Theranos' Ebola test was so sensitive it could detect the virus when there were just five copies of it per milliliter of blood.**

**Aaron Richardson:** That's mathematically impossible with an 80-microliter blood draw, right?

**What Elizabeth wanted in this instance wasn't just unreasonable... it was laughable! Because it defied the laws of physics...**

**Aaron Richardson:** 80 microliters is how much blood was in those vacutainers, right? And so even five copies in a mil divided into 80 microliters is less than one copy per blood collection tube. And for a good test, you really shouldn't detect something when there isn't a copy in your reaction. So, I had arguments with them about this all the time.

**<< pull it under to have John explain — over top of Richardson >>**

**What Aaron is saying sounds complicated, but it's actually pretty simple: Because of Elizabeth's obsession with using as little blood as possible, they didn't have enough of it to work with. Theranos' nanotainers, the little tubes it used to collect blood from patients' fingers, had a volume of just 80 *micro*-liters. And there are 1,000 microliters in a milliliter. For what Elizabeth had bragged to Trott to even begin to be possible, they would have had to draw twelve and a**

**half times more blood than the nanotainers could hold. Needless to say, you can't get that much blood from a finger prick.**

**There was a reason Elizabeth wanted to exaggerate the sensitivity of the Theranos test: By doing so, she could claim that it would detect the virus before infected patients showed any symptoms. But that was unrealistic.**

**Aaron Richardson:** She wouldn't distinguish between things that were theoretically possible versus like robust and reproducible, right? Like, yes, you *could* theoretically detect an infection a day before symptoms, but in practice you're not going to be able to do that very often. So, yeah, she would... there'd be some germ of something there. But the way she presented it I think would, would give the listener a very different idea than the truth.

**This was a pattern with Elizabeth: When she really wanted something, she tended to ignore contradicting facts or evidence... As if she could bend reality to her whims...**

**It wasn't just the sensitivity of the test that she exaggerated in this way... It was also her claim that Theranos could complete it in just 22 minutes...**

**Aaron Richardson:** I don't remember any one under, like, two hours. I think that's a misleading statement, too.

**But Elizabeth and Sunny continued talking up Theranos' Ebola test in conversations with BDT. In late November of 2014, they had a video call with Trott and six of his deputies. During this call, Elizabeth said**

she expected the FDA to approve Theranos' application in the next two to three weeks and she was pushing the agency to let it publish the test's sensitivity on its label. The point would be to highlight how much better it was than competitors like BioFire, a Salt Lake City company that had just gotten the first commercial Ebola test approved by the FDA. According to BDT's notes, she said, "other tests do not publish this statistic because it is so bad."

Sunny, meanwhile, said Theranos was going to install its testing services at the Abu Dhabi airport, which was a hub for travelers coming out of Africa.

This talk of testing for Ebola in airports was pure fantasy too. Aaron Richardson told me that Theranos' Ebola test performed OK when they ran it manually. But as Lina Castro had experienced firsthand, it was a different story when they transferred it to the miniLab.

**Aaron Richardson:** And that took a lot of work, like a lot of babysitting on the machines, because they would drop tips or it would break or the gantry would block or whatever. It was not very robust engineering. So, there were engineers on site all the time, you know, opening up the machines and trying to restart them. To think that that is something that's ready to deploy in an airport or something really doesn't make a lot of sense to me. It seems like a big... a big stretch.

**Mechanical failures were one thing, but that wasn't the half of it.**

**One day, Aaron and his colleagues in R&D got a lesson in why the miniLab... was never going to work to test for something like Ebola.**

**By now most of us are familiar with the term “PCR test.” It’s the most accurate type of test for Covid-19 and it’s also the best test to detect Ebola. PCR tests are performed using this thing called a thermocycler. The thermocycler... and this gets a little complicated so bear with me... heats and cools a blood or saliva sample over and over, breaking off strands of the virus’s DNA and amplifying it billions of times. The product of that chain reaction is called amplicon.**

**In order for the miniLab to do PCR, Theranos’ engineers had to cram that instrument... the thermocycler... inside the machine, between its numerous other components. But the thermocycler caused the miniLab to overheat, so they’d also added an exhaust fan in the back to cool it down.**

**What happened next showed why Theranos had no business jumping into the fray of this particular public health crisis.**

**One evening, one of Aaron’s colleagues inserted an Ebola sample in a miniLab and left it operating overnight to complete the test. The machine happened to be sitting directly beneath an air vent and, as was often the case in the R&D lab, its external cover had been removed so engineers could go in there with their tweezers if something got stuck.**

**Lina Castro:** So, what happened? Because they put this instrument below an HVAC vent, what they did was it took the amplicon and it actually took it all over the building. So this is like a molecular diagnostics laboratory's worst nightmare.



**Those billions of DNA strands created by the PCR reaction—the so-called amplicon—had aerosolized and been blown throughout Theranos' offices. They weren't dangerous per se; they were just tiny bits of DNA from inactivated virus. But they were *everywhere*. And that meant Theranos could no longer test accurately for Ebola. Because *every* test it conducted would now be contaminated with those stray strands of amplicon and throw up a false positive.**

**Lina Castro:** I have heard of laboratories, not just Theranos, but laboratories in other parts of the country where they had amplicon contamination. They had to bleach the ceiling. They found it in their ceilings, in their cars, in their like... everywhere. It's just... and you can't see it. So, you can't really know whether it's there or not. It's just like a nightmare. And then all your reagents, you have to throw them away. You have to buy everything new. You have to clean everything.

**Aaron and his R&D colleagues alerted Elizabeth and Sunny to the contamination, but they refused to take it seriously at first.**

**Lina Castro:** So then the fact that the whole building was contaminated with the actual... with amplicon from Ebola, I mean, to them that was like, oh, yeah, that's no problem.

**Aaron's team pleaded with Sunny to let them hire a fumigation company to clean the premises, but Sunny initially refused because it would mean shutting down the R&D lab for a few days.**

**Lina Castro:** They didn't want to do it because it was like they need it to work. They were very focused on getting FDA approval for the assay. That was their focus, FDA approval.

**The fact that the miniLab's cover had been off. And that it had been sitting below an air vent were partly to blame for the contamination, but not entirely. Aaron says the heart of the problem was the minilab's design: it packed a bunch of components into one open space. PCR tests were never going to work well on a machine like that.**

**Aaron Richardson:** They had no interest in building a device that would be suited for molecular detection. You know, they had this idea that they want to build one device that can do 120 things but, you know, that... it's not going to do any of them that well.

**This was another instance of Elizabeth not accepting reality and pushing her vision of an all-in-one machine that could test for anything despite limitations her scientists and engineers had warned her about.**

**The contamination incident happened just weeks after Theranos had moved into brand new headquarters in Palo Alto. Not every part of the company had moved to the new building, though. The clinical lab that handled live patient testing had moved to a different facility in Newark, across San Francisco Bay. That spared it from being contaminated too. But it caused major headaches for Lina Castro, whose job required her to travel back and forth between the two labs. She had to spray a surface decontaminant called DNA Away on literally everything she touched. Every. Single. Thing.**

**Lina Castro:** So, I would drive to Palo Alto in my car. Whatever they would give me to bring back to Newark, I would clean it. Then I would clean my steering wheel, my shoes. Like I would spray like my jeans, everything. And then when I got to Newark, somebody would meet me outside, would clean whatever they

had given me again.

**To convince Sunny that the problem had to be dealt with once and for all, Aaron's team had to put together a color-coded map of the contamination so Sunny could visualize it and understand how widespread it was. After resisting a cleanup for nearly a month, he finally relented.**

**Aaron Richardson:** There was this company that did decontamination and brought in this ionized hydrogen peroxide machine to sort of blow all this stuff around. It was strong enough that it peeled barcodes off some of the machines, but it still didn't get rid of all that DNA.

**While Theranos decontaminated its offices, the Ebola experiments on the miniLab were put on hold. And work on the company's FDA application stalled. In January of 2015, the agency sent Theranos questions about its initial submission, but the company didn't answer them for months. Elizabeth kept these setbacks quiet. As far as her board of directors knew, the problem wasn't Theranos, it was the FDA...**

**BREAK 2**

**SEG C**

**In March of 2015, Elizabeth was invited to Stanford. She was now a full-blown celebrity, the Silicon Valley prodigy who was upending medicine. Forbes had anointed her the world's youngest self-made**

**female billionaire. She was a sought-after guest speaker. Her talk at Stanford was a fireside chat with Theranos board member George Shultz. About half an hour in, she got a question from the audience about the FDA. She answered it with her usual spiel about how she welcomed FDA oversight of laboratory tests. But as she spoke, Shultz interrupted.**

**George Shultz:** But there are frustrations. For example, is it OK for me to say?

**Elizabeth Holmes:** I don't know. I don't... Maybe you should not say.

**George Shultz:** For example, Elizabeth has...

**Elizabeth Holmes:** No you should not say, no.

**George Shultz:** ...a test that will spot Ebola very early before it is symptomatic, so it can be treated before it becomes communicable. So, we're waiting for approval.

**Elizabeth Holmes:** We're, we're working with the agency. We have a very good relationship with the agency. And it's been it's been something that... that has proved to us that supporting the requirement for FDA regulation, even of tests that right now don't have to be regulated by FDA is the right thing to do.

[AUDIENCE LAUGHTER]

**Elizabeth hadn't told Shultz that Theranos' Ebola application was stalled because it had failed to answer the agency's questions. Instead, she'd left him with the misleading impression that it was the FDA being slow. And now that fib was boomeranging back on her in public. Although... being the smooth operator that she was, she was able to play the awkward moment for laughs.**

**There was something else Elizabeth hadn't told Shultz. By the time of their talk at Stanford, her interest in Ebola had waned. The outbreak in**

**West Africa was coming under control, and after the death of the traveler from Liberia in Dallas, the CDC had successfully stopped the epidemic from spreading on U.S. soil. As one former Theranos executive put it to me, “after the New Year, Ebola was kind of dropped... Elizabeth was no longer bugging us about it.”**

**Meanwhile, Byron Trott’s BDT Capital had walked away from an investment in Theranos for reasons unrelated to Ebola. In fact, why BDT walked away is a whole other story... a fascinating one... that I’m going to tell you in another episode of this podcast.**

**But back to Ebola. Before it walked away, BDT had drafted a 21-page memo about Theranos for its co-investors. It listed all the Ebola claims Elizabeth and Sunny had made to the firm.**

**One of those claims was that the CDC had asked Theranos to develop an Ebola fingerstick test because of “the propensity of field workers to accidentally stick themselves with infected needles.”**

**That wasn’t true. A person with knowledge of the matter told me it was Elizabeth who’d approached the CDC Director Tom Frieden, not the other way around. And Frieden had found her claims about Theranos’ test incomplete, implausible or inconsistent. He’d even likened them to “cold fusion.” That’s scientist speak for something that’s laughably impossible.**

**What about the \$120 million contract Theranos claimed to be negotiating with the government to test for Ebola at U.S. airports and in West Africa? As far as BDT knew, that contract was now expanding to “provide the infrastructure to contain future biothreats.”**

**But Frieden had never heard of such a contract.**

**So... were Elizabeth and Sunny lying about it?**

**In hindsight, it sure sounds like it:**

**Jessica Chan:** You'll see on the third paragraph down, it says, company is currently negotiating the terms of a contract with the U.S. Government to provide testing services for Ebola within U.S. airports and alongside the U.S. military and aid agencies in West Africa. Did you tell BDT this?

**Elizabeth Holmes:** I don't remember a specific conversation to that effect.

**That's Elizabeth being confronted with the BDT memo by SEC staff attorney Jessica Chan in the summer of 2017.**

**Jessica Chan:** Were you negotiating the terms of a contract with the U.S. government at that time with respect to Ebola?

**Elizabeth Holmes:** Not that I can recall.

**Jessica Chan:** So would this statement be true as of late 2014?

**Elizabeth Holmes:** I don't think so, but I I can't remember exactly who we were engaging with on Ebola contracting.

**Sunny was also asked about the big government contract in his SEC interview two weeks later:**

**Rahul Kolhatkar:** What about the statement two more paragraphs down: "The company is currently working with the government to finalize a contract which it plans to announce in the coming months launching in U.S. airports shortly thereafter."

**Sunny Balwani:** My recollection is I did not make this comment. And I don't know if anybody, best of my knowledge, was talking to the government or not.

**Clearly, there never was an Ebola contract under negotiation. It was something Elizabeth and Sunny said to impress BDT and its co-investors.**

**At best, as Elizabeth herself told the SEC, she and Sunny had hoped to pitch the government on a contract once Theranos test got approved by the FDA.**

**But that FDA approval never came. Although Theranos eventually did send responses to the agency's questions, the FDA found them unsatisfactory, and its application languished.**

**The Ebola epidemic subsided in early 2016. By then, I had published my first exposé on Theranos and the company was in a fight for its life. To try to turn public opinion around, Elizabeth went to Philadelphia to address the annual meeting of the American Association for Clinical Chemistry. There, in front of thousands of laboratory scientists from around the country, she unveiled the miniLab. And she touted something else: a new test.**

**Elizabeth Holmes:** Finally, we'll present results on the nucleic acid detection capabilities of the miniLab and introduce our Zika nucleic acid-based assay on miniLab.

**The Ebola epidemic had faded from view, but there was a new plague sweeping across Latin America: Zika. Women infected with the mosquito-borne virus were giving birth to babies with undersized heads and brain abnormalities. Elizabeth told the assembled scientists that Theranos had developed a highly accurate fingerstick test for the virus and had submitted it to the FDA for approval.**

**Elizabeth Holmes:** We've submitted assay validation results for this assay to the FDA for emergency-use authorization of this test.

**At Theranos, Zika had become the new Ebola. An entry from Tom Brumett's journal from around this time reads: "Zika is the top priority! This follows Elizabeth's pattern of going for the most talked about disease in the world at any point in time — she is still a publicity hound; politician through and through."**

**Sunny had even flown to Colombia to discuss a Zika testing contract with the government there. In a text exchange they'd had while he was down there, Sunny had told Elizabeth that Colombia's health ministry was "practically begging" for Theranos' Zika test because it wanted to screen every pregnant woman for the disease. Elizabeth had responded excitedly: "This is a blessing from God for 2016."**

**But the Zika test turned into a fiasco, too.**



Two weeks after the Philadelphia conference, FDA inspectors showed up at Theranos headquarters in Palo Alto for the second time in a year. They requested all the data and documentation underpinning Theranos' Zika submission. As they poured over the documents, they came to a startling conclusion: The company hadn't implemented basic patient safeguards during its Zika study, which had been conducted in the Dominican Republic.

Rather than wait for the inspectors to go home and write up their report, a new Theranos compliance executive named David Wurtz decided Theranos should own up to its mistake and withdraw the Zika submission then and there. And since the company's Ebola submission had been lingering at the agency for months with no approval, he decided to withdraw that application too and start everything from scratch.

But he needed Elizabeth to sign off on his decision and she was nowhere to be found. So Wurtz and the teams that had put together the Zika and Ebola submissions waited late into the evening for her to return to the office and give her OK. When she finally appeared, they learned she'd been at a dinner in San Francisco hosted by Glamour magazine.

By then, Aaron Richardson and Lina Castro were long gone. Aaron had taken a job at another diagnostics company, while Lina had been fired. In a text he sent Elizabeth before dismissing her, Sunny wrote: "Really absolutely hate Lina... Terrible energy."

**Lina Castro:** He called me into his office, and he told me that he was going to do great things without me. How did that work out?

**When they look back on their time at Theranos, Aaron and Lina say the company never had a chance of success with its Ebola test because the miniLab was so flawed, and the company's culture was so dysfunctional.**

**Ever since the Covid-19 pandemic began, I often get asked a question: Would Elizabeth have tried to exploit our current crisis — as she did with Ebola and Zika — if she'd still been in business? And if so, would she have succeeded? I asked Aaron what he thought.**

**Aaron Richardson:** It would have been the sort of same kind of slapdash "hey, let's... let's put something together that can maybe work and we'll try to get emergency use." You know, it would have been the same thing. I don't think unless they totally developed technology differently and built a new device that was capable of rapid and highly specific molecular testing, I, yeah, it would have been the same story. It would have been a big flurry of activity, lots of late night meetings and working over the weekend. But I don't think the outcome would have been any different.

**Lina agrees, and she knows a thing or two about Covid. Since the pandemic began, she's been working 60-hour weeks in a county public health lab 30 minutes east of San Francisco testing samples for the coronavirus.**

**But... a thought still gnaws at her...**

**Lina Castro:** I wonder, did she actually believe that? Did she actually believe that... like, what she was telling these people, she actually believed that her little

black box was going to work and do what they wanted? I just wonder sometimes... if she was just completely delusional or she was like lying, flat out lying to people.

## **CREDITS**

**Bad Blood: The Final Chapter is a Three Uncanny Four production.  
The show is hosted by me, John Carreyrou.**

**Our show is produced by Lena Richards, Rahima Nasa, and Jennifer Sigl, with help from Shane McKeon. Emily Saul is our reporter. Jenny Kim is our production manager. Rachel B. Doyle edited.**

**Laura Mayer is our executive producer.**

**The show was mixed by Kevin Seaman. Casey Holford composed the theme music.**

**If you like the show head over to Apple Podcasts, Spotify, Stitcher, or wherever you get your podcasts and hit subscribe. Leave a rating and a comment while you're there. It really helps new listeners find the show.**

**For Three Uncanny Four, I'm John Carreyrou. We'll be back next week.**