

Scandal in Silicon Valley Wall Street Journal's John Carreyrou on the Rise and Spectacular Fall of Theranos

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Mark Masselli: This is Conversations on Healthcare, I am Mark Masselli.

Margaret Flinter: And I am Margaret Flinter.

Mark Masselli: Well, Margaret we're watching a very different approach to the most recent outbreak in Ebola in Africa, which is impacting a remote region of the democratic republic of Congo. This time around, global health officials have quickly mobilized.

Margaret Flinter: Well doctors with our borders has deployed medical teams to the region and the newly created Ebola vaccine is being sent to the region as well. This is a vaccine that was created in the wake of the Ebola epidemic just a couple of years ago where it sickened 30,000 people, killed around 11,000 people.

Mark Masselli: But it did provide one important opportunity Margaret and accelerated push to create a workable Ebola vaccine. Recent trials have confirmed the vaccine was highly effective in humans, so that's good news for health workers on the ground and highlights the absolute importance of following the protocol of good science when putting new tools into the marketplace.

Margaret Flinter: And I have to say, I don't think there has been enough of a worldwide shout-out to the scientist who created that vaccine, so let's give him a shout-out today.

Mark Masselli: Uh-huh, absolutely.

Margaret Flinter: And all of this brings us to our guest today, John Carreyrou who is an award-winning investigative journalist for the Wall Street Journal who uncovered a significant fraud in recent history, a multibillion dollar Silicon Valley startup called Theranos which created quite a sensation for promoting a technique that would, as they said, revolutionized diagnostic testing.

Mark Masselli: Even while investors were pumping billions into the company, there was skepticism about the claims. Mr. Carreyrou pursued the story and uncovered a high level of fraud that not only duped investors, but put hundreds of thousands of patients at risk. He has written a book about his investigative work called Bad Blood, really looking forward to hearing his story.

Margaret Flinter: And Lori Robertson will stop by, the managing editor of factcheck.org, but no matter what the topic, you can hear all of our shows by going to chcradio.com or go to iTunes.

Mark Masselli: And as always, if you have comments, please email us at

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chcradio@chc1.com or find us on Facebook or Twitter, we love hearing from you.

Margaret Flinter: We will get you our interview with John Carreyrou in just a moment.

Mark Masselli: But first, here is our producer, Marianne O'Hare with this week's headline news.

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Marianne O'Hare: I am Marianne O'Hare with these Healthcare Headlines. World Health Assembly has recently convened to tackle some weighty issues impacting global health. Representatives from member countries of the World Health Organization addressed a wide range of topics including global preparedness for the next pandemic since the WHO took heat for not responding nearly quickly enough to the Ebola epidemic of 2014 and 2015 that created a global preparedness monitoring board to ensure their readiness to respond to outbreaks of any kind, anywhere. The assembly also welcomed the incoming director general of the World Health Organization, Dr. Tedros Ghebreyesus who is facing a mounting number of challenges including increased incidents of new and recurring virus outbreaks such as Ebola, but also growing global antibiotic resistance.

Meeting all of these global health challenges requires money, and budget shortfalls are a constant strain at the organization. One of the WHO's significant campaign seems to be closed to achieving its 30-year-old goal with only 5 cases of polio reported worldwide in the past year, the 30-year-old polio eradication campaign appearing near completion.

Meanwhile, malaria kills some 450,000 people per year worldwide, most of them children and affects millions. The Gates Foundation is lending some significant support to an effort, Bill Gates announcing he is backing gene-editing experiments using CRISPR technology that can alter mosquito DNA to render them infertile or to program mosquitoes to become incapable of carrying or transmitting malaria. He says it could prove a viable weapon in the quest to eradicate this deadly global illness.

Does vaping or using e-cigarettes help our hardened smoker quit? Well, a recent studies suggest that may not be the case, study published in the New England Journal of Medicine looked at 6000 smokers offered cessation programs, participants who were given financial incentives or rewards had a much more significant cessation rate than those participants who were given e-cigarettes. At the end of the 6-month period, the financial rewards group showed the only significant achievement in remaining smoke-free. I am Marianne O'Hare with these Healthcare Headlines.

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Mark Masselli: We are speaking today with John Carreyrou, two-time Pulitzer Prize winning journalist at the Wall Street Journal and author of *Bad Blood: Secrets and Lies in a Silicon Valley Startup*. It's a detailed account of the dramatic rise and fall of Theranos, a multibillion dollar biotech startup that had promised a revolutionized diagnostic testing. Mr. Carreyrou joined the Wall Street Journal in 1999 where he covered business and international terrorism. He was named bureau chief for Southern Europe and later became the health and science bureau chief at the Wall Street Journal. Mr. Carreyrou has earned numerous other awards including the George Polk award for financial reporting. He earned his BA in political science and government at Duke University. John, welcome to Conversations on Healthcare.

John Carreyrou: Thank you for having me.

Mark Masselli: As I was reading your book and it is a page turner, yeah, I started to think about the American financial schemes, sort of Ponzi scheme, so I started to think about Enron and Bernie Madoff, Lehman Brothers, and you know, I was thinking, we hated all those people, but we loved Elizabeth Holmes and the sort of prospect of Theranos and what it offered the opportunity for. And I wonder if you could just give our readers sort of the thumbnail sketch if that's possible of what happened here?

John Carreyrou: So, Elizabeth Holmes is a young woman who dropped out of Stanford in 2003, but she is 19 years old and she dropped out because she had a vision which was to basically pioneer a blood diagnostics product. And she had this vision for an armband that would have these little micro needles that would draw blood and diagnose you with whatever ailed you and then you know simultaneously cure you by injecting the appropriate drug. It turned out that that was pretty much science fiction, so she then pivoted to a device that she wanted it to be a more sophisticated and complete version of the blood glucose monitors. She wanted it to be a machine that could do every lab test man to man and she wanted to do it of just a drop of blood pricked from the finger. And by 2013-2014 went live with the technology in Walgreens Stores, she had a partnership with Walgreens and the company sold shares in a fund raising round in early 2014, that valued the company more than \$9 billion and Elizabeth Holmes became Silicon Valley youngest female self-made tech billionaire. And it sort of fulfilled this desire that people had in Silicon Valley and American society at large to see a woman breakthrough among all these tech visionaries and billionaires, you know, the likes of Mark Zuckerberg and the Google founders. And then I came along and the Wall Street Journal came over and we revealed that things weren't quite as they seemed.

Margaret Flintner: Well John, I think what is most surprising to me about this story now is the number of very sophisticated high-level investors and industry leaders

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who were so quick to jump on board based on little more than claims from Elizabeth Holmes as the company founder. And we have read about the carefully orchestrated media events to promote the Edison miniLab, the machine that could allegedly conduct hundreds of diagnostic tests on just this tiny drop of blood. But as we understand it from your work, scientists on the inside were actually pretty well aware that the technology just wasn't there, didn't work, what made it possible for so many investors to be duped?

John Carreyrou: Well, she rolled out the blood test involving stores and then used that really at its validation, sort of confirmation that the technology existed and worked because she had gone commercial with it. And so a lot of these investors who came and put hundreds of millions of dollars into the company in 2014 to 2016, they did largely on the strength of the fact that there are no services were available to the public. You know, how that came to be is one of the most incomprehensible parts of the story when you think that Walgreens got duped and didn't do really any due diligence, and there is a chapter in my book that explains that Walgreen has actually hired a lab consultant to vet the Theranos technology. He traveled to Palo Alto and met with Holmes and her boyfriend, Sunny Balwani a couple of times and he started smelling a rat and tried to alert Walgreens executives. And they basically ignored him and Sunny and Elizabeth asked the Walgreens to exclude him from meetings and from his weekly video conference calls and Walgreens ended up marginalizing its own consultant. And as a result, Theranos was able to roll out involving stores and then the investors saw that and thought, well this got to be the real thing, right?

Margaret Flinter: Uh-huh.

John Carreyrou: Because it's commercial.

Mark Masselli: You know John, I wonder if you could walk through how you found your entry point to unraveling the story. In the backdrop, there were threats and lawsuits, rumors, intimidation within the company, tell us about that journey that you followed your sort of investigative instincts and how that unfolded?

John Carreyrou: So she had risen to fame pretty much in June of 2014 and the thing that really made her break out was this cover story in Fortune Magazine, but she didn't come on to my own radar until that six months later when I read a profile of her in The New Yorker magazine. That story left me with a strange feeling, there were some aspects of it that were off to me that the notion that a 19-year-old college dropout who had just two semesters of chemical engineering courses under her belt had dropped out and pioneered groundbreaking new science. I was skeptical of it's possible for that to happen in computers, you know, you can pretty much teach yourself how to code at 10 years old on your college computer the way Mark Zuckerberg did, but in Medicine, you really do need real training.

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Margaret Flinter: Right.

John Carreyrou: -- and put in years of research to really add value. That being said, I probably wouldn't have done anything with it if I hadn't gotten a tip about a month later. And the tip came via a practicing pathologist in Columbia, Missouri who moonlighted at that time as the writer of the [inaudible 00:10:30] blog called pathology blog. And he had read The New Yorker story too and knowing [Inaudible 00:10:36] about blood testing was immediately skeptical about the claim that you could do so many tests of just a tiny capillary blood sample. And he wrote a skeptical item on his blog and was immediately contacted by this little group of Theranos skeptics, one of whom had been embroiled in [inaudible 00:10:53] with Elizabeth Homes.

Margaret Flinter: Aha.

John Carreyrou: And that person's name was Richard Fuisz, and it so happened that Richard Fuisz has just made contact with the laboratory director of Theranos who just left the company and was alleging all manner of wrongdoing. But I felt that if I could get through a primary source then this might be the beginning of a story. And sure enough over the ensuing weeks, I did make contact with him and he was petrified because lawyers of Theranos were threatening him and so I agreed to grant him confidentiality and then he started opening up to me.

Margaret Flinter: Well John, what's really remarkable to me is how far they were willing to go to carry out the fraud in the face of so much damning evidence about the failure of Edison to perform on any reliable level. And I think the most shocking part is that patients were actually put at risk and one of your sources I understand was a clinician in Arizona who was able to recount a number of patients who received false diagnoses and even underwent medical treatment that was not appropriate or not necessary. Help us understand the depth of harm that was foisted upon the individuals who ended up being directly involved and the threat to patient safety that was really carried out?

John Carreyrou: Right. That's when the really big red line was crossed is when they went live with the testing, Walgreens Stores first in Palo Alto, and then in about in 40 Walgreens Stores in the Phoenix area, and that was in 2013. So by the time I came along and started investigating the company, its test had been available at Walgreens Stores for about year and a half. And in reporting the story, I went to Phoenix and I talked to several doctors and came across several examples of patients who had received questionable test results, one of them was a lady who had received test results showing that she had about 6 or 7 abnormal values. And her symptom was that she had ringing in her ears and when her doctor put the abnormal lab values and the symptom together, became really concerned that the patient was on the [inaudible 00:12:57] and sent her immediately to the emergency room. And then the patient underwent a battery of

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scans and tests and then finally at the end of her stay at the hospital they ran her labs again and all those values came back normal. And so at that point, she was released from the hospital and she had several more MRIs over the ensuing week. And finally, she and her doctor concluded that it was a false alarm and it's one of the ways in which patients were affected by this giant unauthorized medical experiment.

Mark Masselli: We are speaking today with John Carreyrou, two-time Pulitzer Prize winning journalist at the Wall Street Journal and author of *Bad Blood: Secrets and Lies in the Silicon Valley Startup*. John, so many people were duped in this, her board of directors was a who's who Henry Kissinger - former secretary of state, Bill Frist - former US senator of surgeons, Sam Nunn, George Shultz, this is astounding that she could have amassed all of this political capital, I can't help but think there are investigative enquires going on, but one, how did they get duped and what's been the fallout here.

John Carreyrou: Right. So one of Elizabeth's tricks was to gain the support and backing of people, usually older men with prestigious reputation, the first person in that category was Channing Robertson, her engineering professor at the Stanford School of Engineering. And he accompanied her to venture capital meetings when she dropped out, then she wrapped Donald L. Lucas around her finger, a pretty well known venture capitalist who helped Larry Ellison take Oracle Public in the mid 80s. She pivoted to charming George Shultz, the former secretary of state who crafted the Reagan administration's foreign policy, Shultz is someone who, you know in his 90s has always been passionate about science and when he heard Elizabeth, sort of unspool [PH] her vision, he really bought into it and joined her board. And then he introduced her to all his buddies at the Hoover Institution which is the conservative think tank and that's how she met Henry Kissinger and all these other ageing statesmen. And that's how she came to have that very powerful board of older men who by the way had zero expertise or knowledge about laboratory science. And that gave her credibility with the investors that she conned, she scrupulously avoided DCs who had any medical technology experience and she targeted basically billionaires and billionaire families, among them Rupert Murdoch who invested on \$125 million, family of Betsy DeVos, our current education secretary which put in 100 million, the heirs of Sam Walton put in 150 million, so that's how it unfolded. And then with respect to your question, which is what's going on now, she has been charged with fraud by the SEC and she negotiated a settlement without admitting wrongdoing. But there is also criminal investigation spearheaded by the US Attorney's office. And my sources tell me that that investigation is very advanced and drawing to a conclusion and that criminal indictment of Elizabeth Holmes and of her boyfriend, Sunny Balwani are a distinct possibility.

Margaret Flinter: Well, this is incredible illustration of what can happen. We want innovation, we want solutions to some of our vaccine problems in medicine and how badly things can go wrong in the fast moving pace of innovation and

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healthcare and the real need, the absolute need for rigorous empirical analytics and data. And I think we look at this and say, no peer-reviewed articles on any of this, so what can we learn from the Theranos story that helps us better balance the hopes of innovation in healthcare with the need for the evidenced-based research?

John Carreyrou: Right. Well, I would say there is reverence for entrepreneurialism and innovating, creating startups that within 10 or 15 years become, you know the next Googles. And I would say that we shouldn't let this reverence excuse wrongdoing, this is -- Elizabeth is someone who idolized Steve Jobs and idolized Apple and she wanted to be the second coming of Steve Jobs and she was going to do anything and everything to get there. And on her way she committed wrongdoing, they basically committed fraud and they put patients in harm's way. And our reverence for entrepreneurialism shouldn't mean that we let these people get away with playing by different rules, they have to play by the same rules we all play by, that's one of the big lessons to me of this story. The other thing to bear in mind is that there is a convergence right now between traditional tech Silicon Valley which is the descendent of the microprocessor industry and medicine and the two are quickly converging. And the Theranos story is a lesson that as this convergence happens, we can't forget that we are talking about patients and we are talking about patients' lives. And therefore you have to do things rigorously and scrupulously, and you have to abide by regulations. And it's not by any chance that the healthcare mystery is the most regulated in the country because ultimately, you know it's patients' lives that are at stake.

Mark Masselli: So John, why did you do it, you've sort of got under her skin or psyche in some ways, what was the motivator here?

John Carreyrou: She is just someone with voracious ambition, you know I have an anecdote in the book where she is 9 or 10 years old and a relative asks her, "What do you want to do when you grow up?" And her answer was, "I want to be a billionaire." And the relative said, "You don't want to be President?" And she said "No, the President will marry me because I have a billion dollar." So that's really, it's no exaggeration to say that she wanted to be rich and famous.

Mark Masselli: Yeah.

John Carreyrou: And it's a story of someone who pursued that ambition at all cost.

Margaret Flinter: We have been speaking today with John Carreyrou two-time Pulitzer Prize winning journalist at the Wall Street Journal and the author of *Bad Blood: Secrets and Lies in the Silicon Valley Startup*. The book is available on Amazon and in book stores and you can also follow Mr. Carreyrou's work at the Wall Street Journal or follow him on Twitter @JohnCarreyrou, and I am going to

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spell that C-A-R-R-E-Y-R-O-U. John, thank you so much for your tenacity, for your investigative journalism, for your reporting, and for joining us on Conversations on Healthcare today.

John Carreyrou: Thanks very much for having me.

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Mark Masselli: At Conversations on Healthcare, we want our audience to be truly in the know when it comes to the facts about Healthcare reform and policy. Lori Robertson is an award-winning journalist and managing editor of FactCheck.org, a nonpartisan, nonprofit consumer advocate for voters that aim to reduce the level of deception in US politics. Lori, what have you got for us this week?

Lori Robertson: We find heated rhetoric on both sides of the aisle when House Republicans pursued a bill that would expand work requirements for the food stamp program.

In February, the most recent month for which we have figures, 40 million people received food stamp benefits. The GOP proposed work requirements would cause 1.2 million fewer people amongst to access the benefits by 2028 according to the nonpartisan Congressional Budget Office. Under current SNAP rules implemented in 1996, able-bodied adults between the ages of 18 and 49 and without dependents are required to work at least 20 hours a week or participate in a qualified job training or volunteer program in order to be eligible for more than three months of benefit over a three-year period.

The proposed GOP log would raise the age of those subject to the work requirement from 49 to 59 and extend the work requirements to adults with children ages six and older. The minimum work required would rise to 25 hours per week in 2026, 62% of those who would lose benefits would be able-bodied adults caring for children 6 or older. Another 27% would be able-bodied adults between the ages of 50 and 59.

Another proposed change in the bills would cut off SNAP eligibility for those whose gross income exceeds 130% of poverty instead of the 200% threshold for SNAP recipients in some states that would cause another 400,000 household per year to lose eligibility. The bill failed in the house in May, but Congress is expected to take up such legislation again, and that's my fact check for this week. I am Lori Robertson, Managing Editor of FactCheck.org.

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Margaret Flinter: FactCheck.org is committed to factual accuracy from the country's major political players and is a project of the Annenberg Public Policy

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Center at the University of Pennsylvania. If you have a fact that you would like checked, email us at chcradio.com, we'll have FactCheck.org's Lori Robertson check it out for you here on Conversations on Healthcare.

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Margaret Flinter: Each week, Conversations highlights a bright idea about how to make wellness a part of our communities and everyday lives. Louisville, Kentucky has consistently been on a top 20 list of US cities you don't want to live in, if you have a lung disorder surrounded by the nation's leading rubber manufacturing entities and nestled in Ohio River Valley, this is the city that has grappled with pollution. Several years ago, the city's newly hired chief of innovation made a decision to tackle the issue, and through his work in public health research, Ted Smith had learned of a tech-enabled smart inhaler that when synched to a person's phone acting like a GPS for whenever that person needed to use the rescue inhalers.

Ted Smith: Essentially to put a GPS transponder on top of your inhaled medication so that when you took a puff of your medication, it would take a snapshot of what time it was and where you are. And that kind of real-time monitoring of asthma event is really high value signal, and you are capturing it in real time.

Margaret Flinter: Smith dubbed the program, AIR Louisville and tracked 1100 participants over the course of a year. He said they were able to chart environmental triggers in any given area where an asthma attack occurred and chart real-time data on the conditions and the location giving them some great public health epidemiology data.

Ted Smith: We ended up with a very high, special resolution map of the burden of asthma in Louisville, Kentucky. And then that led us to explore, you know where those little micro areas are that are problematic and what we might be able to do about it.

Margaret Flinter: More importantly, the smart inhalers gave users a feedback loop of information which allowed them to better manage their exposure to known asthma triggers.

Ted Smith: One part of the use of the technology is the surveillance, but another part of the technology is the feedback moved to the user who learns how poorly controlled or not their asthma is or how adherent they are with the medication they are supposed to be taking daily. And there is an immediate effect, people end up getting better control of their respiratory disease.

Margaret Flinter: Reliance on emergency inhalers dropped 78% among participants and the city was now armed with data that could help them devise

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pollution mitigation strategies.

Ted Smith: The harder problem that I think the rest of the country has which is our ambient air quality standards are still not low enough and people are exposed to levels of pollution that we are going to have work hard to figure out how to remove.

Margaret Flinter: A tech-enabled smart inhaler that gathers meaningful data that informs public health officials how they might reduce the burden of asthma, health care, while teaching asthma sufferers to better control their disease and stay healthier, now that's a bright idea.

Margaret Flinter: This is Conversations on Healthcare, I am Margaret Flinter.

Mark Masselli: And I am Mark Masselli, peace and health.

Conversations on Healthcare broadcast from WESU at Wesleyan University, streaming live at www.wesufm.org and brought to you by the Community Health Center.