

Scientific research studies are becoming increasingly unreliable in today's world because the lack of rigor they are put through. In one biomedical study, only 48.7% of the studies that scientists tried to replicate turned out to be true, meaning they were unreliable. In NPR's award winning journalist Richard Harris' new book, *Rigor Mortis*, Harris talks about the failing of scientific research studies. Harris came to the University of Illinois to talk to students and faculty members about his book and the "reproducibility crisis" that has been recently affecting the world.

Harris himself isn't a scientist, but he has learned a lot about the scientific and medical fields through his many years of covering the environment, medicine, and science in general for NPR since 1986.

"In science, you want to reproduce things because that's how you know it's real," said Harris. "Cancer and other biomedicine studies have been struggling to produce strong results because of causes like bad ingredients, statistical errors, funding pressures, and designs that are susceptible to bias." The studies are also proven unreliable because other professionals in the study are unable to replicate or reproduce these studies.

Harris originally wanted to call his book *Science Friction*, a story about problems that slow down progress in science. In one cancer study about colon cancer, scientists took blood cell samples from patients with cancer and then people who were cancer free to compare the data. But the research was contaminated because the test tubes that were used added unneeded data to the blood count results. Even fMRIs, which are functional magnetic resonance images that measures brain activity by detecting changes associated with blood flow, can result in a 70% false-positive rate.

"It's like nine out of ten airplanes that were designed fell out of the sky." Scientific research's reliability is being affected because people are following the "I used to do good science, but now I do fabulous science" approach. That means rather than working hard to find good and dependable results, scientists are just working to find success and money.

Tom Murphy is someone who depended on scientific research to help cure his ALS, but with the drop in dependability, the tests failed. When research tests were performed on mice, they worked, but when they were performed on humans, they failed. So questions arose why the same outcome didn't match for both organisms. At the end of the tests, scientists said that none of these drugs had much expectations that they would work in the first place.

With so much unreliable work being produced, scientists have thought of ways to get the quality back to what it used to be. Scientist Arturo Casadevall thinks change starts with how we educate young scientists on the best techniques in biomedicine and methodology. He also thinks scientists who want to work on research should publish less, and only publish the best quality work.

One woman who was in attendance today for Richard Harris' speech at the University of Illinois said she thinks that scientists who are working research studies should talk to other professionals in the field, and find those two or three really critical friends that can help you shoot straight by telling you when you're way off base or when you've made a glaring mistake. Find the people that can confirm your work to make sure you're doing your work correctly. Research can be more reliable if you have someone checking your work as you go, you need to have transparency.

"Science is self correcting, so eventually all these problems get sorted out," said Harris, but sometimes you need to add a few extra measures to improve the quality of your research.

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