Exhibit A and other true crime shows can fuel misconceptions about forensic science

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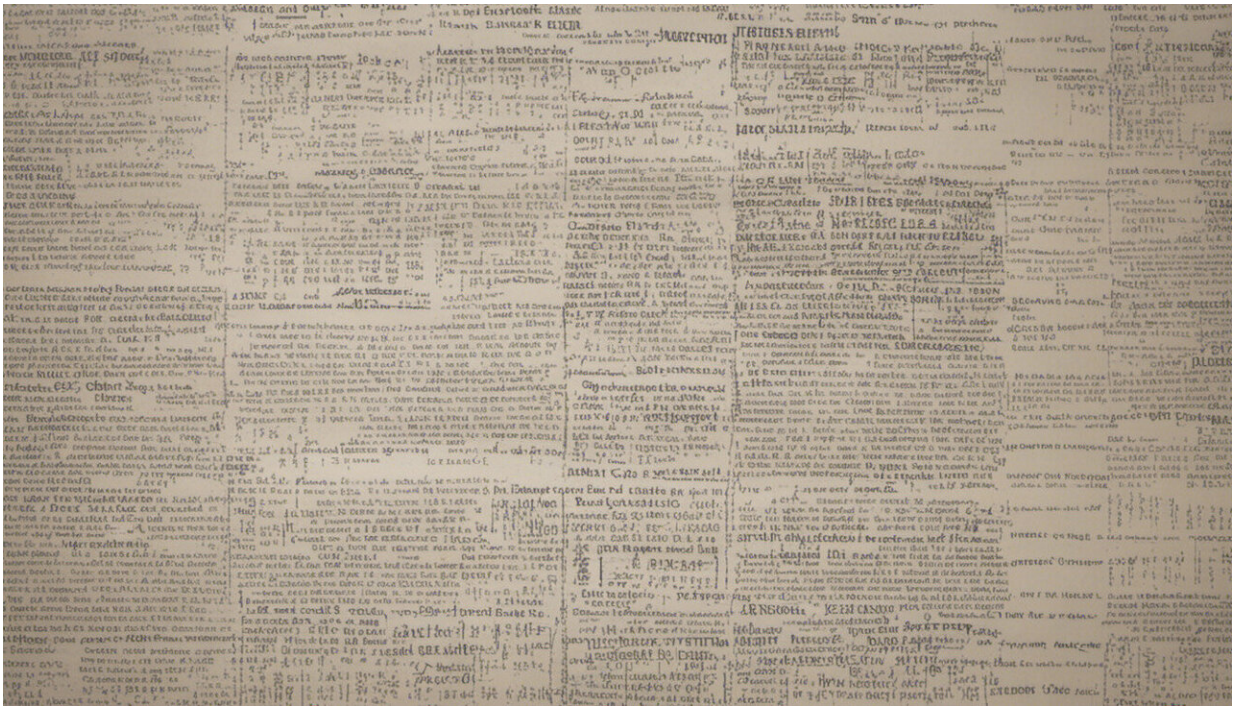

Credit: AI-generated image (disclaimer)

Forensic science is under attack. A string of recent collapsed trials and quashed convictions that relied on forensic evidence have led some experts to say the field is in crisis.

Several US and UK government reports over the last few years have

highlighted and condemned failings in the use of forensic science. And there is an increasing rhetoric in the media against "junk" forensic science, an informal term used to condemn techniques not validated by a solid body of scientific research.

Among the public, the popularity of true crime documentaries exploring the role of forensics in potential miscarriages of justices, such as Making a Murderer or Netflix's recent Exhibit A, may be encouraging the idea that forensic science doesn't provide trustworthy evidence. But it's not the science itself that is the issue. It is how it is misused by rogue scientists or misinterpreted by the police and the courts.

DNA profiling

One example of a well established, highly validated forensic science technique is DNA profiling, which involves comparing the DNA of a suspect to that found at a crime scene. DNA profiling is often referred to as the "gold-standard" of forensic science. This is based not on the power of specific evidence, but the fact it is based on meticulously researched scientific principles and has been thoroughly tested.

When DNA profiling was first used in the case of suspected rapist and murderer Colin Pitchfork, it underwent a baptism of fire, where the science was being challenged from all sides, legally and scientifically. But the evidence—based on semen samples taken from the victims' bodies—was deemed watertight and Pitchfork was given a life sentence. DNA profiling emerged as a virtually unchallengeable forensic science discipline in routine cases.

So if all we need is to conduct a series of validation studies to prove whether a forensic technique is sound, why are some techniques still in question? For routine cases, there often isn't a problem. If someone breaks a window and reaches through to open it, they might cut

themselves on the glass leaving some blood behind which is recovered and undergoes DNA profiling. This provides a strong, single-source DNA profile that matches the suspect.

Exhibit A featured a case in which touch DNA evidence was misused. Credit: Netflix

Touch DNA

The challenge lies in non-routine cases. One episode of Exhibit A looks at "touch DNA", a form of evidence that may be turned to if there isn't a stronger source of DNA. It basically refers to small DNA samples transferred to other people or objects that someone has touched, often from skin cells from the palms of their hands. Touch DNA is typically found in very small amounts (less than 0.5 nanograms).

The documentary featured a case in which someone was beaten up by a large group of men, one of whom pulled off the victim's shoe. Investigators recovered what appeared to be a matching shoe from a nearby roof, and created a profile from touch DNA found on it. This was the point when good science became bad.

All of the research supporting the use of DNA profiling comes from abundant sources of DNA associated with a body fluid, such as blood or semen. But in the Exhibit A case, there was no indication where the small amount of touch DNA had come from. This meant the quality of the resulting DNA profile was not as good, producing what's known as a low-level mixed DNA result that could contain DNA from multiple sources.

This means that even if the profile created by the DNA sample matched that of the suspect, you cannot be absolutely sure that the DNA actually came from the suspect. And yet, in the case featured in Exhibit A, the DNA result was treated the same as if it were a good quality result by the software used to analyse it.

Too many unknowns

Using touch DNA involves a lot of unknowns. We don't know exactly where any given sample comes from, but we also don't know enough about how well the samples transfer or how long they can last. These questions are currently the basis of a significant amount of research. But what was challenged in this episode of Exhibit A (and the rest of the series) was the application, or rather misapplication, of forensic science, not the science itself.

One of the problems with forensic science, is that the courts require black and white answers, which science generally cannot give. This means that there is often pressure to reinterpret results in simpler terms,

leading evidence to be presented as much more definitive than it should be. For example, a court may treat matching DNA profiles as conclusive proof that a sample came from a suspect when, as we know, there are limitations to this.

These kinds of miscarriages of justice based on misuse of evidence largely stem from a desire to see justice served. People who work in law enforcement or forensic science want to contribute to making their communities safer. In a high-profile or particularly horrific case, that emotional drive becomes a lot stronger. There is also a drive to be creative and innovative with the application of forensics.

This isn't inherently a bad thing (it's what fuels progress, after all), but there needs to be more of a practical acceptance of the limitations of the forensic science within the justice system. Without this, not only will there continue to be miscarriages of justice, but forensic science as a whole could be damaged, potentially leading to even more people being wrongly freed or imprisoned.

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