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AN ANTI-VAXXER'S NEW CRUSADE

Dr. David Ayoub used to be active in the anti-vaccination movement. Now he's challenging mainstream science again—as an expert witness for accused child abusers.

By David Armstrong
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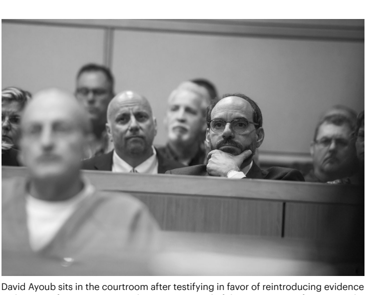

David Ayoub sits in the courtroom after testifying in favor of reintroducing evidence in the case of James Duncan, who was convicted of thirteen counts of aggravated abuse of his infant son. Photograph by Zack Wittman / ProPublica

This article is a collaboration between The New Yorker and ProPublica.

On the morning of April 19, 2016, Melanie Lilliston received an urgent call from the Little Dreamers day-care center, in Rockville, Maryland. Her six-month-old daughter, Millie, was being rushed to the hospital. Doctors there found that Millie had fractured ribs, facial bruises, and a severe brain injury. Melanie watched as her daughter was loaded onto a helicopter for emergency transport to Children's National medical center, in Washington, D.C., where doctors discovered more injuries: a fractured leg and arm, and bleeding in her eyes. Millie died three days later.

The day-care operator, Kia Divband, told police that Millie had started choking while drinking a bottle of milk and lost consciousness. The Montgomery County medical examiner, however, determined that her injuries were caused by blunt force. Investigators discovered, on Divband's phone and computer, Internet searches for "broken bones in children" and "why are bone fractures in children sometimes hard to detect." A former employer of Divband's told them that, the day before Millie was hospitalized, Divband had called to inquire about a job, and a baby could be heard wailing in the background. Divband told him the baby wouldn't stop crying and that "he just couldn't take it anymore," the former boss recalled. Divband was arrested and charged with fatally abusing Millie.

At Divband's trial, last year, a radiologist named David Ayoub testified for the defense. Ayoub, who is a partner in a private radiology practice in Springfield, Illinois, told jurors that he had reviewed X-rays and other medical records, and had concluded that Millie had rickets, a rare condition that causes fragile bones. The disorder, which is usually brought on by a prolonged and severe lack of Vitamin D, could explain Millie's injuries, Ayoub said.

Seeking to cast doubt on Ayoub's credibility, the prosecutor brought up a different issue. Was it true, she asked, that Ayoub believed that Gavi, the Vaccine Alliance, a charity funded by the Bill and Melinda Gates Foundation to increase vaccination rates in poor countries, was committing genocide? "That's right," Ayoub said.

The prosecutor asked if Ayoub believed that Gavi—along with the World Health Organization, the Gates Foundation, and UNICEF—was using vaccinations to force sterilization on people in Third World countries. "Yes, that's my belief," Ayoub said.

As evidence, he cited a report from 1972 by a commission headed by the philanthropist John D. Rockefeller III and a 1974 study overseen by Henry Kissinger, who was the Secretary of State at the time, warning about the dangers of population growth. It's "no leap of faith" to believe that vaccination is being used to carry out this agenda, Ayoub said.

The prosecutor also questioned Ayoub about a speech he delivered in 2005, in which he said that his views on vaccination—including his belief that it has contributed to a rise in autism—put him in a "fringe group," and even in the "fringe of that fringe." Ayoub acknowledged making the statement. "Thinking that vaccines were associated with autism, you're clearly a minority view if you're a physician," Ayoub testified. "If you think it's done intentionally for nefarious purposes, you're clearly another level of—you know—different."

In an e-mail, Ayoub said that he did not mean to accuse the Alliance or the Gates Foundation of intentional genocide, though he realized that his 2005 lecture might give that impression. "I was concerned by confirmed sporadic reports that some vaccines distributed in third-world countries contained fertility-reducing substances," he said. "Regardless of whether this was deliberate, careless, unintentional or a cost-cutting measure, I felt that there was a potential for abuse and that this should be investigated."

In the past decade, Ayoub, who is fifty-nine, has become one of the country's most active expert witnesses on behalf of accused child abusers. He estimates that he has testified in about eighty child-abuse cases in the United States, Sweden, and the United Kingdom. He has consulted or written reports in hundreds more.

Prior to his child-abuse work, Ayoub was a prominent supporter of a movement that blames the rise in autism—a neurological and developmental disorder that starts in early childhood—on vaccinations that contain mercury, aluminum, or other substances. These claims are mostly dismissed by scientists, but they have nonetheless spurred a burgeoning worldwide "anti-vaxxer" movement, which has fuelled a decline in vaccination rates. Both positions reflect a deep suspicion of government and mainstream medicine and a rising backlash against scientific consensus in an era when misinformation quickly spreads online.

Ayoub, in a series of interviews, said that his criticism of vaccines is no longer a significant part of his work, and has no bearing on his credibility as a witness in child-abuse cases. (The Divband trial ultimately ended in a mistrial, after jurors could not agree on a verdict. Prosecutors later retried the case and Divband was convicted on child-abuse charges and sentenced to fifty years in prison; Ayoub did not testify in the second trial.) Ayoub said that his testimony in each abuse case is based on a careful review of the medical evidence. He simply wants to see justice done and does not charge for his services as an expert witness, he said. "Parents are being accused and families torn apart based on fractures and/or other boney irregularities that are in fact attributable to bone fragility, not abuse," he said in an e-mail. If rickets, Vitamin D deficiency, and other explanations are not addressed, he added, "parents cannot receive fair trials, and families will be destroyed based on a misunderstanding of the radiology and pathology."

Ayoub doesn't specialize in treating children, however. He is not a pediatrician or a pediatric radiologist. Much of his knowledge about rickets in infants comes from reading studies and textbooks, he has said on the stand, rather than from formal training. His frequent diagnosis of rickets is questioned by specialists in the field. Peter Strouse, the chief of pediatric radiology at the University of Michigan's C. S. Mott Children's Hospital, who has served as a prosecution witness in about eight child-abuse cases, and has consulted in cases where Ayoub was a defense expert, described Ayoub's views as "a complete fabrication. It's sad they can get away with that in court."

David Ayoub is sworn in as an expert witness in the James Duncan case. Photograph by Zack Wittman / ProPublica

Growing up in Peoria, Illinois, Ayoub was a track star who set the state high-school record in the eight-hundred-and-eighty-yard run, in 1977. As an undergraduate, at the University of Illinois, he was the Big Ten conference champion in the thousand-yard run, and he later attended medical school there. Following an interventional-radiology fellowship at the University of Iowa, Ayoub returned to Illinois in 1991 and began practicing radiology in Springfield.

Ayoub told me that he became interested in vaccines about fifteen years ago, after researching treatment for a bothersome knee. He was reading about alternative therapies and ended up subscribing to a newsletter from Joseph Mercola, a proponent of alternative treatments with a large online following and a Web site that frequently features pieces criticizing vaccination. Mercola has also promoted other controversial views, including the idea that fluoridated water can give children A.D.H.D. (In 2016, Mercola agreed to pay as much as $5.3 million in customer refunds to settle a complaint by federal regulators that he made false claims about the health benefits and safety of tanning beds he sold. Mercola did not respond to requests for comment.)

Opposition to vaccination is almost as old as vaccination itself. But Web sites like Mercola's have helped drive the modern anti-vaccination movement. Most scientists consider vaccination one of the greatest public-health advances of the twentieth century, helping to control or even eradicate diseases such as smallpox, polio, and measles in the U.S. Studies have found that vaccines can have side effects, but they are almost always minor, like redness and swelling.

Anti-vaxxers blame vaccines for an increase in the rate of autism diagnoses among American children. From 2000 to 2014, the number of children diagnosed with autism-spectrum disorder increased to one in fifty-nine from one in a hundred and fifty. Ayoub and others have argued that vaccines are one reason for this increase, though the U.S. Centers for Disease Control and Prevention has concluded that "studies have shown that there is no link between receiving vaccines and developing ASD," and the World Health Organization has issued a similar finding. Prominent anti-vaxxers include celebrities such as the actress Jenny McCarthy and the lawyer Robert F. Kennedy, Jr. Before becoming President, Donald Trump weighed in, tweeting in 2014 that a "healthy young child goes to doctor, gets pumped with massive shot of many vaccines, doesn't feel good and changes – AUTISM. Many such cases!"

A study published in September found that Russian trolls and sophisticated Twitter bots tried to foment confusion about vaccination and create a false equivalency between pro- and anti-vaccination arguments. The authors of the study, from George Washington University and other research institutions, warned, "Such strategies may undermine the public health: normalizing these debates may lead the public to question long-standing scientific consensus regarding vaccine efficacy."

After discovering Mercola's site, Ayoub said he went down a "rabbit hole" and read thousands of studies and documents about vaccination, as he would later about rickets and child abuse. "I was that guy with Birkenstocks mumbling down the hallway," he told me.

Ayoub found particularly persuasive a 2003 report by a subcommittee of the House Committee on Government Reform, which said that thimerosal, a mercury-based vaccine additive, was "likely related to the autism epidemic" and posed a risk to infants and children. The subcommittee was headed by Dan Burton, an Indiana Republican and later a Tea Party member, who said that his own grandson became autistic shortly after being vaccinated. Studies have repeatedly found no link between thimerosal-containing vaccines and autism. Thimerosal was also eliminated from all childhood vaccines in the U.S., except for some flu shots, in the early two-thousands.

In a 2005 speech for the Radio Liberty Conference, titled "Mercury, Autism and the Global Vaccine Agenda," which the prosecutor in the Divband case cited, Ayoub discussed the idea that vaccination could be a cost-effective way to wage "a war on population." He showed one slide that read, "Syringes cheaper than guns," and another indicating that the cost of the wars in Iraq and Afghanistan totalled three hundred billion dollars, while worldwide immunization efforts were initially funded at between one billion and two billion dollars. "So it's a cheap deal and people don't run from these bullets," he said. "They run toward these bullets, so it's ideal."

Ayoub flung himself into the anti-vaccination cause. He served as the medical director for two groups alleging safety problems with vaccines, wrote letters to newspapers, lectured at conferences, testified at legislative hearings, and was the registered agent for a political-action committee funded by prominent anti-vaxxers. Its mission was to advocate for people with autism "caused by exposure to neurological toxins," according to a filing.

Mercola interviewed him at least twice for his Web site. In 2014, Ayoub suggested on Mercola's site that a desire for high profits drove pharmaceutical companies to promote vaccines and state child-welfare agencies to accuse parents of child abuse. "Now, as you know, there's science that links vaccines with autism," Ayoub said. "Why isn't that science believed? Well, it's attacked. It's marginalized because there are competing papers, generally very flawed papers, which refute their claims. [They] design studies in order to give the answer that they want. That's going to happen when you have an industry this strong. The government is a big industry. Child Protection Services is a behemoth, believe me. There's a lot of money generated from the job of protecting children from abuse."

David Gorski, a surgical oncologist in Michigan and the managing editor of the online publication Science-Based Medicine, has described Ayoub as an "anti-vaccine loon" and his conspiracy theories as "paranoia." In an interview, Gorski said he had no idea that Ayoub worked as an expert in child-abuse cases. "How on earth is he qualified as an expert?" Gorski asked. "He is looked at as a total joke. It's disturbing he is effective in this world."

In 2008, Edward Yazbak, a physician based in Massachusetts and an anti-vaxxer who has also served as a frequent expert witness for accused child abusers, asked Ayoub to look at a case he was consulting on, in which the baby had multiple fractures. (Yazbak said that he isn't opposed to vaccination, but "every good thing has bad things.") Ayoub said that the baby, who lived in Florida, had "terrible bones." He wrote a report to the court and the case was dismissed. Soon, Ayoub shifted his target from vaccinations to child-abuse allegations.

In addition to Yazbak and Ayoub, a handful of prominent vaccination skeptics have served as expert witnesses for child-abuse defendants. The Australian hematologist Michael Innis has written that many alleged cases of shaken-baby syndrome—when a baby is shaken out of anger or frustration—are actually vaccine-related injuries. Innis has written letters to medical journals urging doctors to refuse to vaccinate children and contending that vaccines are associated with autism. (Innis did not respond to a request for comment.) Shaken-baby syndrome has been a controversial diagnosis; in some cases, courts have overturned child-abuse convictions after medical issues attributed to the syndrome were later found to result from illness or infection.

In the U.S., the pathologist Mohammed Ali Al-Bayati—the author of the 1999 book "Get All the Facts: HIV Does Not Cause AIDS"—has created a business called Toxi-Health International, which provides analysis and expert testimony in child-abuse cases that he says are actually instances of babies being hurt by vaccines. Al-Bayati said that he does "not have an opinion" on vaccines and simply investigates cases that are brought to him. In some cases, he said, he has determined that a vaccine caused the injuries attributed to child abuse. "I look for all the possible causes and I use functional diagnosis to eliminate all causes based on medical finding, not theory," he said.

Ayoub told me that he sees ulterior motives behind many child-abuse allegations. There is a "child-abuse industry" that is "part of something very incomprehensible," he said. He likened it to an organized-crime ring, with social workers, doctors, and prosecution experts working together to feed foster-care systems engaged in a form of "for-profit child trafficking." He said that state and county child-welfare workers have a financial motive to accuse parents of child abuse, because federal funding for some programs is determined by the number of cases they handle. Another motive, he said, was pedophilia. "I think there are pedophiles that are child-abuse pediatricians. Some of these people are absolutely bizarre." He added that he had read of several doctors at one prestigious U.S. hospital sexually abusing children. "Can you think of a better place to hide evil than under benevolence?" he said.

Battling the scientific consensus requires "a certain intestinal fortitude," Ayoub said, because "it is very uncomfortable to go against popular opinion." He added that it can be dangerous to oppose the child-abuse industry. "People have been murdered over this," he said. "Look up Nancy Schaefer." Schaefer was a state legislator in Georgia who was critical of child-protective services there, calling them corrupt. She died in 2010. According to the final investigative summary prepared by the Georgia Bureau of Investigation, her husband killed her and then committed suicide. The report states that he left several notes confessing to the crime.

In almost all of Ayoub's hundreds of cases, he has attributed a child's injuries to a bone disorder. In particular, he believes that a condition known as infantile rickets is often responsible for broken bones and is dramatically underdiagnosed; many doctors fail even to explore the possibility when examining a child. Ayoub asserts that babies with infantile rickets can suffer fractured bones from "everyday handling," such as a parent bouncing a child on his legs or changing clothes, and the condition can also result in abnormalities that are sometimes misdiagnosed as fractures. (He said that he is careful to note in his court testimony that it is possible that children with bone diseases may also be victims of abuse.) Ayoub said that most of his free time is spent studying and investigating rickets. He said the infantile form of the disease starts at around five weeks of age, peaks at around four months, and is rarely seen in children older than eight months. It is less obvious on X-rays than rickets in older children, he said.

In 2014, Ayoub co-authored an article in the *American Journal of Roentgenology* suggesting that a type of fracture commonly associated with child abuse was, in many cases, the result of infantile rickets. Ayoub reached this conclusion after comparing radiographic images of what were classified as fractures from abuse with those of rickets patients from other studies. The journal published three responses by pediatricians and pediatric radiologists, warning that Ayoub's article could endanger children by mistakenly labelling instances of abuse as bone disease. "Given the stakes involved, we think that the approach of Ayoub et al. is less 'critical' than dangerous and that children and families deserve better," three doctors from children's hospitals in Boston, Philadelphia, and Atlanta wrote in one letter.

James Duncan. Photograph by Zack Wittman / ProPublica

Ayoub's article caught the attention of lawyers for James Duncan, a Floridian who had been convicted, in 1996, of thirteen counts of aggravated abuse of his infant son Kody. He was given a seventy-year prison sentence, which even prosecutors considered unusually stiff. In 2015, his lawyers filed a motion to reopen the case, arguing that new information, including Ayoub's article, proved that Duncan did not hurt his son. Last year, an appeals court ordered an evidentiary hearing to determine whether Duncan deserved a new trial. The effort to free Duncan, who has served twenty-two years in prison, was the subject of an hour-long CNN special this past February. The special included an interview with Ayoub, but it did not mention his anti-vaccination views. CNN did not respond to a request for comment.

At the hearing last month, in Clearwater, before the circuit judge Michael Andrews, Duncan wore an orange prison jumpsuit, with a name badge clipped to his chest, and sat at a table with his lawyers. A large group of friends and relatives filled the spectator area behind him. CNN set up three cameras to record the proceedings from multiple angles. As an expert witness for Duncan, Ayoub came across as confident and practiced. He is balding, with a thin beard with patches of gray, and he often turned to talk directly to the judge and used comparisons to everyday items—the ashes at the end of a cigarette, a shaved carrot—to describe various bone structures.

Ayoub testified that his review of the Duncan case indicated the baby likely had rickets and perhaps other deficiencies that resulted in weak, easy-to-break bones. "I think there is a good alternative explanation for the pattern that we see," Ayoub told the judge. He speculated that fractures of the baby's skull, collarbone, and ribs may have occurred during birth, when a suction device was used. Ayoub testified that other injuries—fractures of the left arm, shin bone, and thigh bone—likely occurred when Kody was being vaccinated. "All those date back to the doctor's-office visit," he said. "Restrained child and what would normally be an innocuous event where you expect a child to fight and could be held down."

Andrews was skeptical. "Did I hear that an immobile infant, a child who is two months or less, has to be held down to be able to be immunized?" he asked. Duncan's lawyer, Lisabeth Fryer, responded that, when an infant is given a vaccination shot, "There's a reflex—with my children, anyway—that required support. . . . There wasn't just a splayed-out child patiently waiting."

Kody Duncan, who is now twenty-five years old and a tennis coach at a Pennsylvania college, testified in defense of his father. Kody said that he did not believe that James Duncan abused him. He said that the two talk by phone every week.

The state's two expert witnesses, including the doctor who had evaluated Kody's injuries at All Children's Hospital, in St. Petersburg, Florida, testified that the medical evidence of abuse was clear and the baby did not have rickets. After being separated from his father, Kody suffered no further fractures, exposing a potential weakness in Ayoub's analysis: How could a baby who suffered more than a dozen fractures from his head to his leg owing to dangerously weak bones not have a single accidental break in the ensuing weeks, months, and years?

Ayoub offered several possible explanations. He said the foster parents who cared for Kody Duncan were likely more careful with him because they were told he had been injured; that it was possible Kody had suffered more fractures, but they were not symptomatic and went undetected; or that his Vitamin D levels rose significantly, which Ayoub said is natural among children at that age, and his bones strengthened. "So there is a window of fragility there," Ayoub said.

Shortly after starting to cross-examine Ayoub, the state prosecutor Paul Bolan asked him, "You also have some other opinions that are not in mainstream medical view as well, correct? You believe vaccines are related to autism, correct?" Ayoub never had to answer. Duncan's attorney immediately objected to the questioning. She argued that the inquiry was "impeachment on a collateral issue." Andrews, who is expected to rule soon on whether Duncan deserves a new trial, agreed that Ayoub's views on vaccination were irrelevant.

Other judges have also blocked prosecutors from asking Ayoub about his beliefs regarding vaccination. When Ayoub testified last year in a Massachusetts state court on behalf of a father accused of murdering his five-month-old son, the prosecutor asked Ayoub if vaccines and autism were something he worked

on extensively. The defense objected, and the judge ordered the lawyers to a sidebar where jurors could not hear them. The judge wanted to know why she should allow the prosecutor to continue asking about Ayoub's vaccination work, according to a trial transcript. The prosecutor said that Ayoub had lectured extensively on "the link between vaccines and autism in an area that he really had no training or expertise in. And the Commonwealth is seeking to show that he flits from subject to subject. He was an autism-vaccine guy and now he's the metabolic-bone-disease guy." The judge instructed the prosecutor to drop the subject.

Ayoub went on to testify in the case that ordinary handling of a child with a "severe bone-fragility disorder," namely rickets, could have caused the fractures. The jury sided with Ayoub over the prosecution's medical expert, Paul Kleinman, a pediatric radiologist who has produced much of the mainstream research on fractures and child abuse, and acquitted the father of assault and battery related to the fractures. A mistrial was declared on a murder charge.

In response to questions about Ayoub, Jeffrey Brown, the defense attorney in the case, said in an e-mail that he had not been worried about Ayoub's vaccination beliefs hurting his credibility on the stand. "It was not relevant," he wrote. "Dr. Ayoub was a very effective and helpful witness." Brown said that he agrees with Ayoub that bone disorders are frequently misdiagnosed as abuse. "It is plain as day to me that the child abuse pediatrician establishment has gotten it wrong. . . . Those who try to trash him and his colleagues are scared of the consequences of being exposed."

Ayoub's zealousness in disputing child-abuse allegations troubled a judge last year in the United Kingdom. In upholding a local agency's determination that a five-month-old baby with twenty-six fractures was abused, the judge, Peter Jackson, of the Royal Courts of Justice, wrote that Ayoub's testimony was "shot through with the dogma that child abuse is over-diagnosed," and didn't meet the legal standard for objectivity. "Having taken up a position, he advanced it with the tenacity of an advocate and was dismissive of alternative possibilities," the judge wrote. "He entertained no doubts about the correctness of his opinion, a dangerous mindset for any expert witness."

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