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Publication Date

2019-07-24

When the Waters Recede

Long after the floodwaters subsided, children and adolescents continue to struggle with the long-term mental health effects of Hurricane Harvey

By Alex Orlando

One day last October, Jake Hall was panicking. His pickup truck roared past the high-rises lining downtown Houston, his mind racing. What the hell was his son thinking? Was he being bullied? Did he want to get out of taking a test? None of the scenarios Jake came up with felt right. Just moments earlier, his phone had buzzed with a call from his 12-year-old's middle school. "I've got Luke here," the guidance counselor told him. "He ran away from school."

It didn't take long before Jake arrived to find Luke sitting in the hallway outside the counselor's office, a mop of light-brown curls spilling over his forehead. "He got up, and he just runs and grabs onto me," Jake remembers. "Before I had even heard the story, something in me said that it was beyond a bullying situation. You just know." Inside, the counselor explained how Luke had been seen walking past the nearby elementary school before a police officer was dispatched to pick him up. Luke held his father's hand tightly as they walked out of the building, unconcerned about the prospect of parental embarrassment that looms over every middle-schooler. The car ride home was fraught with anxiety—and mostly one-sided. "I told him, 'I'm not mad at you by any means,'" the 44-year-old project manager says. "'Mom's not going to be mad at you. But what were you thinking? Where were you going?'" Luke was unable to put into words what spurred his midday flight. All he knew was that he was going home to grab his stuff and leave forever.

At the time Luke fled, it had been six weeks since Hurricane Harvey slammed into the Texas coast near Corpus Christi on the evening of August 25. The storm swirled overhead for five endless days, dumping foot after foot of water on Houston and its neighbors. During that time, Harvey would drop more rain than any other storm, ever, in the recorded history of the United States. It was that torrent of flooding and rainfall that crippled Houston—the nation's fourth-largest city—and has resulted in an estimated \$125 billion in damage so far.

When the skies finally cleared, the havoc that Harvey wrought wasn't hard to see. Homes and businesses were left in ruins while caravans of utility trucks cluttered the streets. Entire communities, like the once-enviable suburban enclave of Meyerland, were ravaged and temporarily abandoned. Other hazards surfaced, from the explosion that shook a chemical plant outside of Houston to the toxic medley of chemicals, debris and waste within the floodwaters themselves. The statistics are no less sobering: 40,000 evacuations, 30,000 water rescues, more than 200,000 homes damaged or destroyed and, as of the time of this writing, over 100 deaths.

But beneath the surface, another, less-visible, consequence was emerging quietly among the thousands of kids, like Luke, who lived through the storm. Julie Kaplow, a pediatric psychologist and director of Harvey Resiliency and Recovery Program at Texas Children's Hospital, notes that children typically rely on a protective, invisible shield—the belief that the adults in their lives are going to make sure nothing bad happens to them. When that shield is shattered, she says, by something like a hurricane, it can have a severe, lasting impact. "They've been in this

safe bubble and now there's something really scary that even the adults couldn't protect them from."

In the aftermath of catastrophic storms like Hurricane Harvey, the toll of long-term psychological trauma can build over the months and years that follow— especially among kids and teens who may struggle to understand and communicate what they're feeling. While most are likely to recover, other major storms have shown that not everyone who lived through Harvey's onslaught will be all right. And with experts cautioning that natural disasters are likely to increase in number and intensity over the coming years, other children in cities across the country may find themselves in the same boat as Luke: adrift in a sea of trauma, even after the waters themselves have receded.

SECTION BREAK

At around 10pm on Sunday, August 27, Jake, Sarah and Luke had just sat down to watch the finale of *Game of Thrones* when water started coming in under the fireplace. The Halls knew that flooding was an inevitability— thanks to a series of increasingly alarming weather alerts, they elevated all of their furniture and shuttled paperwork upstairs earlier that evening—but that first trickle still caught them by surprise. "That's when the panic set in," Sarah says. "I went, 'Oh, god! There's water! Go get towels!' And you're thinking that you can stop the water with towels." Jake rushed around the corner to their bedroom when he took the first step onto the carpet to find it squelch beneath his feet. The room had already flooded.

After a few hours of fitful sleep, the next morning, Luke peered out of the upstairs window at the murky, aquatic canvas that blanketed Knobcrest Drive, a suburban neighborhood on the outskirts of Houston. The sky looked like mushy cotton as rain continued to pour. Lone streetlamps protruded from waist-high floodwaters, casting an eerie glow. Downstairs, the flooding covered every surface, rising up to the edges of furniture propped up on tables. The night before, it had been too dark to see, but daylight cast everything into nightmarish relief. It was time to leave.

Clad in backpacks, Sarah and Luke stood in the rising floodwaters with their new puppy Loki caged in his kennel. Upstairs, Jake inflated an air mattress to use as a makeshift raft for their belongings. Afterwards, the four of them stood by the back door, preparing to evacuate, when Luke seized up with fright, shaking his head 'No' as his eyes filled with tears. The flooding had begun as a frivolous diversion, but it was now a paralyzing reality as Luke saw how swiftly the current outside their stoop flowed; how deafening the whir of helicopter rotors sounded as they pulsed overhead; how deep the water looked. "He just kept saying, 'I'm not going. I can't go. I can't do it,'" Sarah recalls. "It was pure fear of the unknown."

It was half a mile to the other end of the neighborhood where the Hall's friends had agreed to pick them up. Wading across the driveway, Luke clutched his mother's shirt as the water rose higher and higher. At the edge of the curb, the street dipped slightly, causing the water to creep past his armpits. In a small voice, Luke eked out a single word in response: "Mommy." Sarah looked over her shoulder to see her son's face contorted with terror. Once they reached higher ground in the middle of the street, Jake and Sarah told Luke to shuffle his feet to avoid tripping on shrubs and bushes or stepping into an open manhole. "We were trying to get him to be

cautious, but we were probably just adding to the anxiety of the situation,” Sarah says with a sigh.

At a major intersection, the current coursed past them like the Colorado River. To cross the boulevard, Luke had to get in front of the raft so the flow pressed him against the mattress, where his panic swelled once again when he felt the harsh, consistent surge of the floodwaters. “I remember him saying, ‘It’s pushing too hard,’” Sarah says. “The current was so strong that even I almost fell.” With Jake behind the mattress, bracing himself against the current, and the aid of several men helping evacuees through the intersection, they managed to get across. Many plodding steps later, when they finally ran out of water and beached themselves on the pavement, Jake, Sarah and Luke stared at each other in silence. The shock of what they had been through was just beginning to set in.

The Hall’s evacuation was barely a fraction of Harvey’s far-reaching swath of destruction, the effects of which are still continuing to unfold. But research on other natural disasters is acting as an instruction manual, revealing what we can expect to follow the storm itself. When Hurricane Katrina devastated New Orleans in 2005, scientists started studying the psychological impact of major storms. And over the past thirteen years, studies on Katrina have demonstrated a clear link between survivors of a hurricane and mental health struggles. Several showed that children and adolescents exposed to natural—and even man-made— disasters are at an increased risk of developing psychological problems. Another found that rates of mental illness among low-income parents in New Orleans doubled in the aftermath of the storm. “Coming from Katrina, we know that the mental health needs in any disaster are enormous,” says Asim Shah, the chief of psychiatry for Houston’s Harris Health System and Ben Taub Hospital. He adds that about half of the survivors of any natural disaster will struggle with mental health needs, such as depression, anxiety, and, in those confronted by life-and-death scenarios, post-traumatic stress disorder.

Signs of the psychological debris left in Harvey’s wake are already surfacing throughout Houston and Harris County. A survey performed by the University of Texas School of Public Health four months after the storm found evidence of “serious psychological distress” in 48 percent of participants who suffered serious damage to their homes. And while it’s tempting to cling to the notion that Houstonian’s everyday lives are finally returning to normal, those mental health effects aren’t going away anytime soon. “We all know the long-term impact of a disaster like this,” says Janet Pozmantier, director of the Center for School Behavioral Health at Mental Health America of Greater Houston. “The psychological trauma is just now beginning to kick in in a bigger way and will continue to do so for maybe three to five years.”

That trauma is especially worrisome in children, which can often go unnoticed by parents and educators alike. “Children and adolescents are a population which everyone tends to forget,” Shah says. “They don’t complain very easily, and if they do, their complaints are a little bit different. So don’t ignore them if they’re isolating themselves in their room. If they’re not playing and socializing, or if their grades are falling in school where they weren’t before the hurricane, we need to take them to a professional and get some help.”

Several months after the storm, Shah got a call from Texas Commissioner of Education Mike Morath and the board that runs the Houston Independent School District. They told him that as many as 30,000 students could be wrestling with trauma. “I couldn’t believe the numbers,” he says.

Lauren Pursley, a program coordinator for Mental Health America, has been leading trainings on post-Harvey trauma for school counselors and administrators since early October. She begins each of her sessions with a question: how are your students doing? “Across the board, there’s been an increase in self-harm; there’s been an increase in depression; there’s been an increase in suicidal [thinking],” she says. “And there’s been an increase in general anxiety.” The responses she’s received have spanned more than 20 zip codes.

This past March, I attended one of Pursley’s training sessions to see for myself. Hunched over Styrofoam cups of coffee, a mix of counselors, program directors and school nurses sat around a rectangular conference table. Many of their lips were pursed together grimly, their eyes faded with exhaustion. Early in the training, Jennifer Roberts, director of support services for Lamar Consolidated Independent School District, told the group that students in her district have been sent to the hospital for psychiatric reasons at a rate four times higher than average. “I don’t know if my district is an anomaly, but it’s off the charts,” she said.

Murmurs of recognition rippled throughout the room. Some reported upticks in aggression, from minor disciplinary issues to straight-up fistfights. Others chronicled problems with potty-training and disrupted sleep patterns among younger kids—both signs of developmental regression in response to trauma. But one thing remained clear: these weren’t isolated incidents. “This list, if I had to put each of them on a sticky pad and keep them across the wall [for each training session], would be almost identical,” Pursley told her audience. “This is happening across our entire metropolitan area. Now, let’s try and figure out what we’re going to do about it.”

SECTION BREAK

Even after Luke and his parents trudged out of the waters, the next few weeks weren’t easy. The family ended up staying with the same friends who picked them up at the edge of their neighborhood. Like many other homes throughout Houston, it had not been ravaged by flooding. The three of them were squeezed together in a single, small bedroom. (Luke would end up sleeping on an air mattress on the floor, Loki pent up in his kennel beside him.) That first night, Luke laid down next to his mother in the room’s only bed, where they wept together until they fell asleep. Then, the questions came. What’s going to happen to our house? Do we have to live here now? When can I sleep in my own bed again? Over and over again, trapped in a cycle of crying and confusion, Luke kept repeating the same refrain: “I want to go home.”

In the weeks that followed, Luke clung to his parents like ivy. Every time his mother had to go to the grocery store, he would bombard her with questions, desperate to know where she was going and when she would be coming back. “We were trying to get him to understand that it was just a temporary situation, which was hard, too” Sarah says. “Because he was asking questions that we didn’t have the answers to ourselves.” About five days after the evacuation, Jake and Sarah, after debating how to avoid exposing their son to any further trauma, agreed to take him back to pick

up his things, hoping to quell his anxiety about his home and belongings. But when they pulled up to their home, the sidewalks were littered with debris, as if the houses themselves had vomited up their contents—overturned sofas; hunks of drywall; cotton candy-sized tufts of insulation. By that point, the Hall’s first floor had been completely gutted; the front yard a teeter-tottering mountain of furniture and appliances. “He came in the front door and went straight upstairs,” Sarah says. “I don’t think he wanted to be there.”

After almost five weeks of living out of suitcases, bouncing between their friend’s house and Sarah’s mother’s apartment on weekends, the Halls returned home. They tried to convey to Luke that it could’ve been worse—they were lucky no one was hurt. But Luke’s world had been ripped out from underneath him, and in the months after the storm, he quietly changed. His grades started slipping. He stopped speaking his mind. Not wanting to add to his parent’s stress, who were overwhelmed by constant repairs as they slowly worked to rebuild their home, Luke began taking refuge in the bathroom at school just to cry. His typically silly, carefree attitude was submerged as he grew more and more withdrawn. “I don’t know if I was blind to it, or if Jake and I just didn’t want to see it,” Sarah says. “But Luke was really good at hiding it.” When Luke ran away from school, those warning signs, visible but blurred before, suddenly came into razor-sharp focus. Sarah and Jake had been looking at their son from within their own trauma, like trying to decipher an impressionist painting while standing inside it. “[After Luke ran] my mind was just going, ‘How did I not see this? What did I miss? What am I still missing,’” she says.

In the weeks after Luke ran away, his parents moved quickly. The next day, Jake and Sarah bought him a cell phone and installed a tracking app that notified them whenever he left designated “safe” areas, like home or school. (Recently, they both got a notification that Luke had left his middle-school. After panicked calls to the school counselor, it turned out that he was still in class—it had been a technology glitch.) They wasted no time calling the kindly psychotherapist who visited Luke’s school the month before and setting up an appointment. Soon after, once he had completed his one-day, in-school suspension for running away, Luke was abruptly pulled out of class. He thought he was in trouble. Instead, he ended up surrounded by a support group of other students who had been affected by the hurricane. For the first time, perhaps, Luke realized that he was not alone—there were other kids, in his very own middle-school, who were also swimming against the tides of their own trauma.

Today, experts agree that trauma can be thought of broadly, as an emotional reaction to an event, or series of events, so overwhelming that it can affect a person’s ability to carry out daily tasks. The chronic stress that often accompanies trauma can swallow up an individual’s ability to cope, leaving them feeling vulnerable, helpless and afraid. Kaplow, who also directs the Trauma and Grief Center, at Texas Children’s Hospital, thinks that when talking about most major traumas, “objectively, people would say, ‘That is a terrifying event.’”. More than two-thirds of all American children will have experienced some form of trauma by the time they’re 18 years old. And despite popular perceptions, it’s not just warfare that creates trauma; it can be something as mundane as a car accident.

But trauma is also subjective—and the responses to it can vary wildly. Some kids, like Luke, may be perpetually worried about their own safety, clinging to parents and teachers out of a fear

of being separated. Others may show signs—from restlessness and fidgeting to a short fuse that results in angry outbursts—that are uncannily similar to ADHD, making it even harder to diagnose. With older kids and teens, trauma can even lead to substance abuse as self-medication and a swell of risk-taking behavior. And while everyone in Houston was affected by Harvey, their experiences varied widely, from frenzied evacuations like the Hall's to simply seeing constant images on TV of shelters brimming with evacuees and people fleeing the wreckage. Those whose houses weren't flooded might suffer from survivor's guilt.

Despite that spectrum of experiences and reactions, however, for everyone who lived through the storm's lingering downpour, Harvey has been a consistent, chronic form of trauma. (This is known as “complex” trauma, as opposed to “simple” trauma, which refers to a one-time event like a car crash.) Pursely, the program director for Mental Health America, argues that the way we think about trauma caused by natural disasters is shifting. “[With] a tornado or a hurricane, the assumption is it happens once and you move on,” she says, before contrasting that with the cocktail of floodings, evacuations, dislocations and home repairs that survivors of Harvey have had to endure. “All of these things keep piling up and they have not stopped yet,” she continues, snapping her fingers to emphasize each word.

The effects of trauma can go beyond the psychological, as well. Jeff Temple, a psychologist at the University of Texas Medical Branch at Galveston, explains that it can manifest as stomachaches or headaches in kids. “We see the same thing with school shootings, like what happened at Sandy Hook,” he says. “At the time, a lot of pundits would say, ‘Man, the kids seem to be doing okay. They don't seem to be that messed up about it.’ But they're having a lot of stomachaches and headaches. [Because] they don't know what depression is and it's scary.” Kaplow and her team at Texas Children's have also seen a sharp increase in doctor's visits among their patients. “We're seeing this with kids who are more avoidant,” she says. “So, if they're not talking about the trauma and they're trying not to think about it. When you exert that kind of mental and emotional energy on such a regular basis, it can really take its toll, physically.”

That toll can build up over time, like a glass slowly filling with water before it spills over the edge. When humans are placed under extreme stress, blood rushes to our vital organs as we prepare to respond to imminent danger. “From an evolutionary perspective, it makes sense,” Temple says. “The stress response was [activated] when a bear came up to us when we were hunting or gathering—we fought or we ran. But then it was done. Now, with these traumatic events, it's kind of always there.” Beyond that, research has shown that prolonged stress can cause inflammation in the body, potentially precipitating other diseases. “We'll hear, anecdotally, lots of parents say to us, ‘Since my husband died, my kid keeps getting the flu,’” Kaplow says. “And there is an element of truth to that. When the body becomes inflamed, it becomes much more susceptible to disease.” Years of research have also shown that adverse childhood events, which can include everything from emotional abuse to natural disasters, are directly connected to a host of lifelong health conditions—including obesity, heart disease, alcoholism and drug use. They can even reconfigure the structure and development of the brain.

For most kids, Hurricane Harvey won't lead to post-traumatic stress disorder (PTSD), which becomes diagnosable after symptoms of trauma (flashbacks, nightmares, irritability, avoidance

and heightened alertness) continue for more than a month and seriously undermine a person's ability to function. "[For] some kids, in the aftermath of something really bad, it's actually normative to have *some* post-traumatic stress symptoms," Kaplow says. Temple agrees that the majority of kids and teenagers who lived through Harvey will come through psychologically unscathed, given a little time. "It'll be a bad experience," he says, "but most everyone will not have any long-term, lasting mental health effects."

But others might be particularly vulnerable to those lingering, chronic consequences. While Kaplow emphasized that few kids will go on to develop full-blown PTSD after weathering Harvey's onslaught, that's not the case for everyone. "What we're finding is pretty consistent with what they found post-Katrina," she says. "Which is that those kids who are presenting to us with PTSD tend to have had prior traumas or losses. And the hurricane greatly exacerbated whatever symptoms they had before." For them, Harvey wasn't the catalyst. It was the tipping point.

Kaplow thinks that grief and loss can make kids particularly vulnerable to trauma. (After Hurricane Katrina, 70% of the kids who had trauma symptoms had experienced the death of a loved one.) She describes a young girl who had lost her brother to suicide before the hurricane hit. Working with the counselors at Texas Children's Hospital, the girl was making progress. "And then Harvey came and basically washed away her entire home, as well as all of her brother's belongings, including photographs," Kaplow says. "All of her tangible ways of feeling connected to her brother disappeared." The sudden loss pushed the patient back to where she had been before receiving treatment. For many Houstonians, especially those in underserved communities who may be exposed to other forms of violence and trauma, Hurricane Harvey might prove to be the final straw.

But Kaplow has also been able to find a shard of hope amongst the wreckage. In its own weird way, the storm has shone a spotlight on the degree of suffering that kids in Houston have been struggling with, even before Harvey hit. "We've had leaders from our underserved communities saying to us, 'We're glad people are finally paying attention to our kids. They've been suffering for years,'" she says. "'Please don't just disappear once the waters recede.'"

SECTION BREAK

After the flooding subsided, attempts to address the storm's mental health effects began to take shape. Only a few days after the hurricane, Mental Health America partnered with UNICEF to create a training program for teachers on trauma-informed classroom strategies. Around the same time [FK], Kaplow and her team at Texas Children's Hospital formed the Harvey Resiliency and Recovery Program to connect with communities that might have more difficulty accessing mental health care. Recently, they hired a social worker to join their 'mobile unit'—essentially, a retrofitted truck with two rooms and a waiting area for seeing patients—that travels to schools across Houston. "That really caters, primarily, to undocumented families who often are uncomfortable or unable to get here," Kaplow says. "Basically, we're really opening our arms to get as many people here as possible who need our help."

Other efforts began coalescing across the city. In early October, a Hurricane Harvey Task Force on School Mental Health was created at the behest of Governor Greg Abbott and the Texas Education Agency, in conjunction with Texas Higher Education Coordinating Board and the Texas Health and Human Services Commission. So far, its aim has been to connect schools, universities and their communities with counselors, training and funding opportunities in Harvey's wake. "The invisible wounds left behind after this storm are often the most difficult to recover from," Governor Abbot said in a press release. "It is crucial that the State of Texas provides our educators and students with all available resources to address mental health needs as quickly as possible."

Some mental health professionals are hoping that the ordinariness of the storm—everyone experienced it, after all—will act as a gateway to treatment. "For kids, especially, because there's such a stigma around mental health, [they] don't go in for help—they delay," says Pozmantier, the director for Mental Health America who also sits on the governor's task force. "But now, kids will say that they're going to see the school counselor because of Harvey. And everybody understands because it was a community trauma."

But it's no secret that the road to recovery will be long and arduous. Compounding the issue, the extent of the trauma throughout Houston is still surfacing—especially as we continue to hurtle past the six-month marker for diagnosing PTSD. "[Those kids] are just starting to come to the forefront," Kaplow says. "I think it's really important to keep that in mind—this is not going to go away." She predicts it will be at least a five-year-long ordeal to really tackle the hurricane's psychological impact.

And with the intensity and frequency of hurricanes, floods, wildfires, and other natural disasters expected to increase in the coming decades, they're accompanied by an uncomfortable truth: this is far from over. "The odds of a hundred-year event [have the potential to] double for every two to three degrees of [global] warming," says John Nielsen-Gammon, Texas's state climatologist. "A hundred-year event becomes a fifty-year event, and so forth."

Temple thinks that while healthy kids are resilient, that can only carry them only so far. Our coping resources can only be taxed so much before we develop anxiety, depression or PTSD, he says. "So someone who experiences one hurricane is maybe better prepared for what to expect [from] the next one. But [they're] also more vulnerable to the negative effects because of that depletion of coping resources."

Luke and his parents are among those still recovering from Harvey. Toward the end of last year, Jake and Sarah slowly started seeing signs of the old Luke coming back. Around Christmas, he started dancing around the house again. "If I don't hear him, sometimes, singing at the top of his lungs in the room, then you know something's wrong with him," says Jake with a grin. "He's just a goofy kid—he likes to have fun and he's very expressive." By January, he had started taking theater class at school. "He's back to complaining about math," Sarah says, rolling her eyes. "That's when we knew that Luke was back. He's even getting in trouble at school for talking in class."

While Luke still struggles with opening up to his parents, he sees a therapist every two weeks. “The ground rules between all of us are that [Luke] has his safe zone,” Sarah says. “He could tell [his counselor] anything he wants, and if it’s something that’s dangerous to himself or someone else, that information comes to us. But we [agreed] we would not ask what they talk about. If Luke wants to share, that’s great—we want to hear it.” At the same time, Sarah and Jake still find themselves wondering in the void created by Luke’s silence: is he talking about trauma? Is there one thing that’s left him particularly shaken? Is it the whole situation? So far, he has not received any kind of diagnosis.

By April, life at home had gotten better—the concrete, water-stained foundation replaced by hardwood floors and their kitchen cabinetry installed. But signs that the Halls are still sharing their home with the monster named Harvey remain. Piles of scrap lumber, peppered with sawdust, are stacked outside their front door. Inside, sofa and tables remain entombed in plastic wrap. Upstairs, a makeshift kitchen still dominates their former study, with pots and silverware stacked on top of a mini-fridge and electrical cords from different appliances splayed across tables and chairs. It isn’t hard to imagine why Luke still has days where he comes home from school and plops himself down on the front porch, shoulders slumped and eyes glazed, refusing to come inside. “He sits on that porch and lasts for hours,” Sarah says. “He has to escape it.”

SOURCE LIST

Interview Subjects

- Jeff Temple, Ph.D. Psychologist and professor, University of Texas Medical Branch at Galveston (UTMB)
- Asim Shah, M.D. Chief of psychiatry, Harris Health System and Ben Taub Hospital
- Sophia Banu, M.D. Assistant professor of psychiatry and behavioral services, Baylor College of Medicine.
- Joann Schulte. Chief physician, Houston Health Department
- Elizabeth McIngvale, Ph.D. Assistant professor of psychiatry, Baylor College of Medicine
- Julie Kaplow, Ph.D. Director of the Harvey Resiliency and Recovery Program, Texas Children's Hospital
- Sanghamitra Misra, M.D. Medical director, Mobile Clinic Program, Texas Children's Hospital
- Luana M. Da Silva. Senior social worker, Texas Children's Hospital
- Janet Pozmantier. Director, Center for School Behavioral Health, Mental Health America of Greater Houston
- Lauren Pursley. Program coordinator, Mental Health America of Greater Houston
- Jennifer Roberts. Director, support services, Lamar Consolidated Independent School District (LCISD)
- Tom Stevens, psychotherapist

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