

Fighting Polio Amid the Chaos of Syria's Civil War

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A Syrian infant receives a polio vaccination last month in a rebel-held area in a Damascus suburb. Though no new polio cases have been reported in more than a year, vaccinators must maintain their efforts because the health system has been destroyed in much of the country. Photograph by Abd Doumany, AFP/Getty. Syria, 2015.

BAB AL SALAM, Syria—The rebel fighter in charge refused to let the strangers pass their position. Gun battles were rocking Aleppo's Bab al-Nasr neighborhood, and the road ahead was packed with government snipers who shot at anything that moved.

The rebel also doubted the strangers' motives. What were these two men doing at his frontline position, unarmed, with nothing more than white armbands and a plastic refrigeration box slung on their shoulders?

Ahmad Jamal, 34, explained that his team needed to vaccinate the local militia commander's children. Polio was a highly contagious virus, he noted, and even one overlooked child could infect hundreds of others.

The fighter relented. Two of his men would provide cover fire for a single vaccinator, who would have to sprint across 80 feet (25 meters) of open ground to reach the family's doorway.

One, two ... Seconds after two rebels charged forward to lay down the cover fire, one was struck down with a gunshot to the shoulder. He survived, but the mission was postponed.

"All of this for two kids," says Jamal, adding that rebel fighters had provided cover for vaccination workers on 50 or 60 occasions. "Sure, we were scared, but we had to vaccinate every child, there was no question about it."

A Perfect Polio Storm

Two and a half years after Syria's civil war broke out, polio cases began to show up in a country that had virtually eliminated the crippling virus in the 1990s. Unlike Pakistan and Afghanistan, which have never been able to eradicate polio, Syria offered a textbook example of how a government should combat infectious diseases.

As far back as 1964 the newly established Ba'ath Party had taken steps to battle infectious diseases, and the regimes of both the current president Bashar al Assad and his father Hafez al Assad before him had insisted on compulsory and free vaccinations for all children.

But starting in 2012, as civil unrest led to violent government crackdown and finally to all-out war, drugs were denied to rebel-held parts of the country, leaving millions of young children and infants exposed to a range of infectious diseases and creating a gap in the country's immunity.

This immunity gap, say scientists, is what allowed the polio virus to return to a country that hadn't seen an outbreak in nearly two decades. And fighting polio amid the chaos of war, as infrastructure breaks down and people are displaced, quickly becomes a health worker's worst nightmare.

Once polio reemerges within a population, the highly contagious virus is extremely difficult to eradicate. It's resistant to common disinfectants, including alcohol (though not bleach), and able to survive for long periods in food, water, and sewage. Most troubling is its ability to hide unnoticed in the vast majority of its carriers. Health experts estimate that each diagnosed case of polio correlates to roughly a thousand infected people, who can silently spread the virus for weeks.

By October 2013, when the World Health Organization confirmed the first polio cases in Aleppo, Syria's largest city, the conditions for an epidemic were in place.

Sixteen months of fighting had left much of the city with limited or no access to clean water and electricity. Open sewage ran through neighborhoods. And local clinics and hospitals had been destroyed or abandoned.

A perfect polio storm was brewing.

Against that dire backdrop, doctors opposed to the Assad regime recruited thousands of volunteers to mount a massive vaccination blitz across the northern conflict zone. Volunteers went door-to-door, navigating between the shifting lines of rival rebel militias while evading regime forces, which targeted them as enemy combatants.

"As Syrians and doctors, we know what polio's return meant and what the consequences would be if we delayed," says Tamer Hassan, who directs the Syrian American Medical Society's work in Turkey. The group is one of the main nonprofits involved in the polio campaign.

"We reacted very powerfully and quickly to this outbreak," Hassan says.

An Early Warning System

Health observers got the first indication that polio was back in Syria in October 2013, when monitors in Aleppo and Dayr az Zawr Province, located in the eastern desert and bordering Iraq, found several children with acute flaccid paralysis, the main symptom of polio.

An emergency response team dispatched from Turkey by the humanitarian wing of the Syrian opposition in exile, the Assistance Coordination Unit, found nearly two dozen cases in the area. Within weeks, new cases began popping up across the country in Idlib, Al Hasakah, and Hamah, in addition to those found in Aleppo. In all, 36 cases would be confirmed in Syria.

Polio's return was not a total shock. The Assistance Coordination Unit and its supporters had expected various public health crises stemming from a breakdown in

hygiene, including cholera outbreaks and a parasitic disease called [leishmaniasis](#). To prepare for such health emergencies, the group set up an early warning system on the back of an existing network that had been established in rebel-held areas to track the Syrian military's use of chemical weapons against civilians.

But confronting polio would be tricky. The virus mainly affects children younger than age five. At least three rounds of vaccine are needed to fully immunize a child, and even those who are immunized can still harbor the virus in their bodies long enough to infect others.

Meanwhile, new outbreaks of fighting were moving people around Syria in unpredictable ways.

Across the border in Gaziantep, Turkey, several medical relief organizations formed the Polio Control Task Force, with a mission to immunize more than a million children under the age of five as fast as possible.

Accomplishing this would require them to acquire a stockpile of vaccines and to create a "cold chain" distribution system that would keep the drugs, which quickly spoil when exposed to heat, refrigerated while moving them from place to place until they could be administered to the children.

Health teams also would need the help of local councils and a patchwork of rebel groups that included both moderate and radical Islamist militias. Even radical fighters from the Islamic State (also known as ISIS) agreed to allow vaccinations, though a few groups of foreign fighters, who subscribe to a range of conspiracy theories about the drugs, refused to allow the teams to work in their areas.

No money or direct support was offered by major international organizations that fight polio worldwide. Mandates governing both the World Health Organization and the United Nations Children's Fund (UNICEF) bar them from taking part in relief without the approval of the Syrian government.

But the task force did have a network of opposition doctors and supporters inside Syria willing to undertake a highly unusual and dangerous vaccination campaign.

Volunteering to Vaccinate in a War Zone

Mohammad Radwan, a soft-spoken doctor and father of two from Aleppo, signed on with the Polio Control Task Force as a district supervisor soon after hearing about the outbreak.

"We were afraid that Aleppo and the surrounding countryside would be the next [polio] outbreak after Dayr az Zawr," he says. "The Assad regime was sending no aid to areas outside its control, only [barrel bombs](#)."

According to the United Nations, most of the city's medical professionals had fled to escape the violence and avoid conscription in the Syrian army. This left only about 40 doctors to serve the remnants of a city, once inhabited by 2.5 million people, that now came under regular assault by government forces.

Ahmad Jamal had no interest in medical work prior to the civil war. The former clothing trader had planned to go back to university before the fighting broke out. In 2013, several of his closest friends died in the battle for the city's historic citadel, [a UNESCO World Heritage site now in ruins](#). Rather than pick up a weapon and fight the regime, he opted to serve as a first-aid provider because of the severe shortage of nurses in Aleppo, which he likened to a "city of ghosts."

Most of Jamal's family has fled to Turkey. He does not hold that against them. Although a few uncles and their children remain in Aleppo, he says they work and fight for the Assad regime, not an uncommon rupture among families in Syria today.

"They are enemies," says Jamal, adding that they "constantly" threaten to kill him.

In the fall of 2013, [a Facebook posting](#) caught his eye. The Polio Control Task Force was calling for volunteers to help beat back the virus. Jamal got in touch with Hassan, a doctor he trusted, who explained the gravity of the outbreak.

"So I volunteered," he says.

First Jamal traveled to the task force's headquarters in Turkey to learn how to set up and run mobile vaccination units. Then he returned to Aleppo and joined dozens of volunteers for training sessions in how to properly handle the heat-sensitive vaccines and correctly administer them to children.

In cities and rural areas, local councils of opposition leaders chose their own volunteer vaccinators, which enabled the task force to set up trusted distribution networks. A cold chain was set up to transport the vaccines from Turkey to a distribution hub inside the Syrian border. From there, they would be transferred to district centers across seven northern and eastern provinces.

Once the supplies of vaccine were distributed, Radwan and other district supervisors would map out assignments and deploy dozens of two-person volunteer teams to scatter among the rubble-strewn blocks to locate unvaccinated children.

One person would carry the vaccines in a cooler and administer a couple of drops to each child. The other person would take notes on the children and mark the homes (with chalk) and the fingers (with ink) of those they vaccinated. Each child had to be vaccinated three times, so accurate record-keeping was crucial.

The procedure was repeated over and over, several times per day—under the near-constant threat of attack.

Overrun by ISIS

Just days after the campaign kicked off in January 2014, the Polio Control Task Force's main supply hub, less than two miles (three kilometers) inside Syria, had to be relocated because of shelling attacks by ISIS.

It wasn't clear whether the task force itself was targeted intentionally. In some areas, vaccination teams wound up in the crossfire of erupting firefights. Several districts under siege proved unreachable.

Still, the task force managed to vaccinate hundreds of thousands of children during the first round.

"I was surprised at how easy it was," says Jamal, of the first six-day campaign.

Buoyed by this success, organizers say, increasing numbers of young volunteers lined up to join the task force.

Then inter-rebel conflict broke out between more moderate factions and ISIS. Flush with experienced foreign fighters and better weapons, ISIS units overran some long-contested areas that were home to polio's first victims in Syria's new outbreak, including Dayr az Zawr.

Yet even as these clashes multiplied, rebel groups of all stripes, including ISIS, allowed vaccinators to continue their campaign into the spring.

"Even the fighters have children they want to be vaccinated," says Hassan (with the exception of some foreign militants who believe vaccines are filled with poison from the West).

According to Hassan, Jamal, and other volunteers, the Assad regime remained the biggest threat, targeting vaccinators along with civilians in rebel-held areas to which the regime forces laid siege. Nowhere was this more evident than in the fractured streets of Aleppo, on which the regime continued to rain bombs.

Assad's Barrels of Terror

As the vaccination campaign progressed, barrel bombs became a cheap staple of the government's arsenal and a daily source of terror for those living on the ground. The steel drums packed with hundreds of pounds of explosives and projectiles were rolled out of helicopters hovering out of the rebels' firing range. These crude but highly effective weapons leveled entire blocks in rebel-held areas, destroying civilian homes, markets, and hospitals.

"Bombing every day, barrels in the morning, afternoon, night," Jamal says. "Bombings are normal—we can deal with those—but the barrels ..."

"It's very terrifying," Hassan says, noting how the area around a hospital his organization supported was bombed three times.

After dropping a barrel bomb, Hassan says, regime forces often would wait for emergency responders to arrive at a blast site to help the wounded, then drop a second and sometimes third bomb. He estimates that 20 to 50 barrel bombs are dropped on Aleppo each day.

The vaccination campaign's first casualty was an 18-year-old volunteer named Mohammad Kalaaji, an ambitious student from a poor family. Jamal knew him through the campaign and remembers that he often had books with him because he was preparing for his university entrance exam.

During the first round of vaccinations, Kalaaji stepped outside an Aleppo home to mark the door as a barrel bomb exploded in the street, sending pieces of shrapnel into his head and heart. The children he had just vaccinated inside also were killed.

Later that day, Hosam Jaroud, a doctor in Idlib Province, was killed in a shelling attack. In the following months, two more volunteers would die.

"We were targeted continually," says Radwan, recalling the time a bomb detonated outside his Aleppo clinic, blasting out the doors and windows. It was the first of his several close calls.

Despite the many risks, and wages of just \$7 a day, doctors say there was no difficulty attracting and keeping volunteers as the campaign wore on. By the end of last summer, the Polio Control Task Force had 8,000 volunteers, who had carried out seven rounds of vaccinations, immunizing an estimated 1.4 million children in opposition-held areas, roughly 100,000 short of its goal.

"This is a revolutionary power that the youth of Syria have," Hassan says. "They are handicapped [by the war], but they have a huge amount of power inside and want to

express themselves, to show what they can do. When given the chance, they can do incredible things, even with limited resources."

"We Are Going to Finish This"

Meanwhile, the Assad regime has embarked on its own polio vaccination campaign.

UNICEF says that a [regime-led campaign has reached 2.9 million children](#) so far, but Syrian doctors living in exile doubt such claims, noting that door-to-door immunizations, the most effective means of stopping the virus, are not being done by Syrian authorities.

Leaders of the Polio Control Task Force say that more than 700,000 Syrian children living under siege remain without access to vaccines, including those in the fiercely contested cities of Homs and Dar'a and in the suburbs around Damascus.

"Of course we feel we have done something good for the Syrian children, but not eradication," says Hassan. "We will continue until all the children are vaccinated."

The last confirmed polio case inside Syria was reported on January 21, and no new outbreaks have been reported in more than a year. But the task force is continuing to conduct "mop-up rounds" in restive areas, where as many as 700,000 children may remain unvaccinated. A new round of polio—and also measles—vaccinations is now under way. As long as babies are born in this fractured country, the need for vaccines will continue.

At the end of 2014, Ahmad Jamal was promoted to head a medical clinic in Aleppo and continues to work on the polio campaign. A driver who helped him on his vaccination rounds, Homs, was recently killed, bringing to 61 the number of friends and relatives Jamal has lost to the war.

He says the city he loves is now "barely livable" and his country has become "like a sheep whose corpse everyone is eating from." But he still has no plans to depart anytime soon. "Assad will triumph if all his opponents leave," he says. "We are committed to this and we are going to finish this."

Radwan, the task force supervisor, insists that opposition doctors and volunteers remain dedicated to vaccinating against polio and all preventable diseases, "even if it costs us our lives."

He was in Gaziantep for some Polio Control Task Force meetings before heading back across the border into Syria, where his family is staying. Over the summer, his wife gave birth to their second child, a boy, in a farmhouse outside the city.

When the moment was right, Radwan gave him two drops of polio vaccine. A small hedge against a precarious future.