The Autumn Ghost—The Danish Polio Epidemic of 1952 and the Birth of Intensive Care Medicine

David Oshinsky, PhD

In 2005, the National Museum of American History opened an exhibition to commemorate the 50th anniversary of Jonas Salk’s poliovaccine. Aptly titled Whatever Happened to Polio? the exhibition chronicled a virus with the terrifying ability to paralyze and to kill. Rarely had the public celebrated a medical breakthrough with such gusto. Salk’s inactivated vaccine, followed quickly by Albert Sabin’s live-virus competitor, stopped polio in its tracks, although the neurologic damage proved irreversible in patients who already had symptomatic infection. In 1952, there had been 20,000 new cases of paralytic polio in the US. Forty years later, there would be none. The vaccines worked so well that memories of the brutal disease grew dimmer with each decade.

Polio’s demise left many questions unanswered. What made it a seasonal disease, arriving like clockwork as temperatures warmed? Why were children the primary victims, especially boys? And why did the most serious outbreaks occur in the higher-resource nations of the West during the 20th century? There are numerous theories, but few hard answers.

However, in other ways, the crusade against polio left a powerful legacy. It marked the beginning of massive public health experiments, such as the double-blind Salk vaccine trials that recruited more than 1 million young volunteers, and it triggered the widespread acceptance of vaccination as an essential barrier against childhood diseases. Much of it was championed by the National Foundation for Infantile Paralysis, better known by its marketing arm the March of Dimes, which revolutionized philanthropy and medical research at a time when the National Institutes of Health was a barely funded afterthought. Using a playbook that mixed fear of the disease with a promise to defeat it, the March of Dimes raised twice as much money in these years as the American Cancer Society and the American Heart Association combined, despite the comparatively modest number of polio cases. Its generous grants funded the laboratories that produced the building blocks for both polio vaccines, while aiding dozens of scientists in surrounding disciplines, including Nobel Prize winners James Watson and Linus Pauling.

The March of Dimes transformed patient care as well by providing the finest equipment and physical therapy. Its most prized machine was the iron lung, invented by 2 Harvard professors in the 1920s to resuscitate coal workers overcome by gas or those who had been electrocuted and were unable to breathe. Airtight and shaped like a torpedo, it created negative pressure around the patient, forcing the chest to expand and inspire air, followed by relaxation of the pressure, with passive chest muscle contraction and expiration. For those with bulbar polio, which induced respiratory failure, iron lung ventilation could mean the difference between life and death.

However, these were difficult machines. They made human contact almost impossible. Patients were trapped inside, flat on their backs, viewing an upside-down world through overhead mirrors. “The worst thing was that you couldn’t get to [patients],” a physician recalled. “You couldn’t even hold their hand. Just to take a blood pressure, you had to be an acrobat.” Washing, feeding, and bathing patients took a team of nurses. The reason that iron lungs remained popular in the US was that the March of Dimes made them a centerpiece of the polio crusade, spending millions of dollars to distribute them to hospitals nationwide.

But as Hannah Wunsch demonstrates in The Autumn Ghost, a superb account of the ghastly 1952 polio outbreak in Copenhagen, neither the disease nor the medical advances it spurred were limited by geography. Indeed, the single most important contribution, aside from the vaccines themselves, came from a small nation still reeling from years of Nazi occupation.
The timing of Ibsen’s US training was perfect. He returned to the Blegdam as the outbreak began, where his broadened perspectives were quickly rewarded. With the death count increasing, largely from respiratory failure, he told hospital officials about his experience at Massachusetts General Hospital and the positive results he achieved. The fact that they listened to, and then endorsed, the ideas of a lowly anesthesiologist was a clear measure of their desperation.

What follows is a story of heroism and medical advancement, beautifully told by Wunsch. Long-term ventilators—those that worked for hours and days—had yet to be developed. The best way to keep patients with bulbar polio alive was to perform a tracheostomy and then hand-ventilate them. “The math was daunting,” Wunsch recounts. Eight-hour shifts, the absolute limit, would require 3 human ventilators per patient every 24 hours—a massive undertaking. Under enormous pressure, the Blegdam recruited medical students from the University of Copenhagen to fill the void. In Denmark, medical students enrolled right after high school, meaning that the fate of the sickest patients rested largely in the hands of teenagers.

The work was monotonous and exhausting. Squeeze the rubber bag, wait several seconds, squeeze again; count the breaths, watch the oxygen supply, stay alert. Burnout was common, but the mortality rate at the Blegdam dropped dramatically once the process began.

There was no March of Dimes in Denmark to ease the financial pain. It turned out there would be no need for one. Supplies poured in—oxygen tanks, tracheostomy kits, blood pressure monitors—and the hospital staff more than doubled in size. There were 27 physicians and 260 nurses at the Blegdam when the outbreak started; there would be 60 physicians and more than 600 nurses by the time the outbreak ended. Denmark being Denmark, the government paid for it all.

The Autumn Ghost goes well beyond heroism. Wunsch argues persuasively that the Copenhagen epidemic helped turn anesthesia into a legitimate specialty, while devising the rough outlines for an intensive care unit by segregating the sickest patients at the Blegdam into a single space where staffers could concentrate on their special needs—in this case respiratory failure and mechanical ventilation. “Some anesthetists and intensive care doctors, including me, mark 27 August as ‘Bjorn Ibsen day’—the day Ibsen proposed using positive-pressure ventilation to save lives,” Wunsch writes, adding “Most people have no idea what they owe to this remarkable doctor and his colleagues in Copenhagen.”

They will soon enough—if The Autumn Ghost receives the attention it deserves.

Author Affiliation: Division of Medical Humanities, NYU Langone Health, New York, New York.

Corresponding Author: David Oshinsky, PhD, Division of Medical Humanities, NYU Langone Health, PO Box 461, Solebury, PA 18963 (David.oshinsky@nyulangone.org).

Published Online: October 31, 2023. doi:10.1001/jama.202318659

Conflict of Interest Disclosures: None reported.

Additional Information: Some references are embedded as hyperlinks in the online version of this article.