

Learning from swine influenza, Ebola virus disease, and Legionnaires' disease in 1976

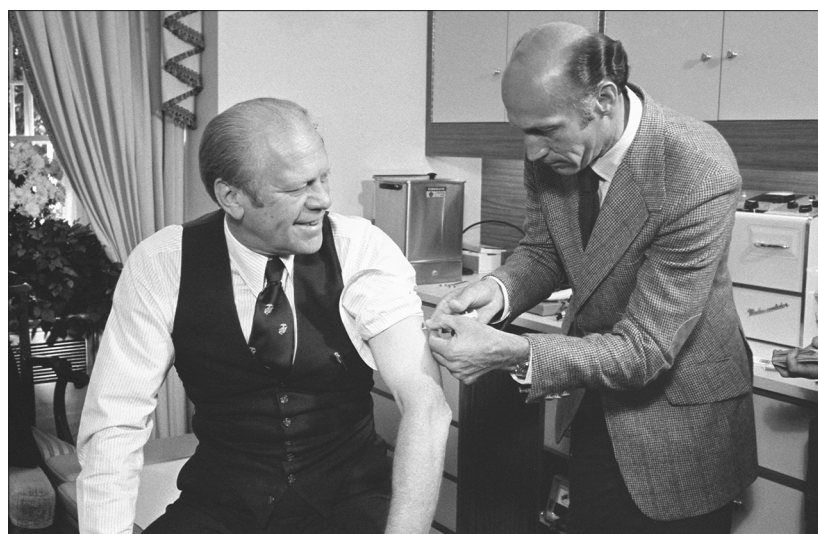
50 years ago during a US election year marked by post-Vietnam war disillusionment, post-Watergate cynicism, and bicentennial optimism, three new infectious threats stress-tested the US public health system. Throughout 1976, a series of challenges emerged: an outbreak of swine influenza A (H1N1) among US troops in New Jersey, NJ, USA; a lethal pneumonia cluster tied to the American Legion Convention in Philadelphia, PA, USA; and an unexplained haemorrhagic fever outbreak in Africa. Although the pathogens and locations were different, the challenge was the same: making sound public health decisions under uncertainty without losing trust or inadvertently causing harm.

The swine influenza episode began in February, 1976, with the emergence of influenza-like illness among recruits at a US Army training centre at Fort Dix, NJ. An investigation yielded an unusual influenza A (H1N1) virus similar to the cause of the global and deadly 1918–19 influenza pandemic.¹ Public health and political leaders faced a dilemma: if a pandemic was coming, waiting for certainty could be catastrophic. But a national vaccination campaign may create avoidable harms and erode trust. The USA chose the latter, accelerating vaccine development and launching a mass vaccination campaign without any known community transmission of the virus from Fort Dix. The decision was elevated to the US President at the time, Gerald R Ford, which limited the ability to change course. As David Sencer, who was Director of the US Centers for Disease Control and Prevention (CDC) at the time reflected, "Creating a program as a presidential initiative makes modifying or stopping the program more difficult."¹ By contrast, WHO viewed the same data and adopted a more wait and see approach.² Little to no vaccine was administered outside the USA except for Canada, which initiated targeted

vaccination of people at increased epidemiological risk, reaching around 800 000 people.³ In the USA, more than 40 million people were immunised before the programme was stopped in December, 1976, due to cases of Guillain-Barré syndrome among vaccinees that exceeded background incidence by around eight-fold; no circulation of swine influenza materialised.^{1,4} In hindsight, the main failure was not in acting early, but rather in continuing headlong towards an irreversible goal with no mechanisms to adapt and stop the strategy as outcomes changed.⁵

Legionnaires' disease presented the opposite problem. The disease outbreak was indeed occurring, but the cause was unknown. Following the July, 1976 American Legion Annual Convention in Philadelphia, 221 people developed severe pneumonia and within weeks 34 people died.⁶ Here, the actions were proportionate

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US President Gerald Ford (1913–2006) receives vaccine for swine influenza from White House physician William Lukash, Washington DC, USA, Oct 14, 1976

to the threat. Multiple hypotheses about environmental and human-to-human transmission were considered by David Fraser, Philip Brachman, Theodore Tsai, Charles Shepard, and other CDC investigators. New laboratory culture methods were developed in response to this outbreak that eventually led to the successful discovery of the bacterial agent *Legionella pneumophila* by CDC microbiologist Joseph McDade and his team. Uncertainty triggered a cascade of disciplined and persistent investigation: interviews with patients, enhanced disease surveillance, data analysis, and testing of water and environmental sources which ultimately identified a novel pathogen. These efforts changed the way we understand the importance of the built environment as a source for infectious disease transmission.

The third event in 1976 was first recognised in two separate outbreaks of Ebola virus disease in what was then Zaire (now the Democratic Republic of the Congo) and Sudan.^{7,8} Epidemiologists Joel Breman, David Heymann, and Colonel Omombo, along with virologists Karl Johnson, Frederick Murphy, Patricia Webb, and Jean-Jacques Muyembé-Tamfun, led investigations that ran in parallel through WHO's coordination of ministries of health with epidemiology and laboratory support from the UK, the USA, and Belgium. By the outbreak's end, there were 602 cases and 431 deaths.⁸⁻¹⁰ In Zaire, transmission was strongly linked to close person-to-person contact and unsafe injections at Yambuku Mission Hospital. The hospital closed after 11 of 17 staff died; the fatality rate was 100% (85/85) among cases classified as injection-associated.^{9,11} In Sudan, the Maridi outbreak was amplified in a hospital setting where transmission was often associated with nursing care; reports describe 61 of 154 nursing staff becoming ill, with 33 deaths.⁸ In both locations, coordinated multilateral efforts controlled the outbreak and mitigated the factors accelerating transmission in health-care settings. This was accomplished by implementing and verifying effective infection prevention and control measures, including ending needle re-use and adherence to appropriate personal protective equipment. The outbreaks also revealed the importance of engaging with affected communities in bringing a lethal epidemic under control.

Taken together, the successes and failures of 1976 are instructive for 2026 and future disease threats. An enduring lesson is neither that public health should act early nor wait for more data—both common refrains in

an early outbreak. Instead, the lesson is that uncertainty must be managed with proportional, revisable, science-based decisions, made by trusted, reliable people who are continually assessing failures and successes to help navigate risks.

These three events underscore the importance of matching the mitigation to the threat, implementing decision gates for course correction, and letting the scientific evidence, not political leadership, drive public health decisions and communications. The responses to the 1976 outbreaks of Legionnaires' disease and Ebola virus disease leaned on measures that were scalable and correctable, including surveillance expansion, infection prevention and control, and targeted environmental or facility actions. The response to swine influenza, however, moved too quickly, getting ahead of the evidence and epidemiology. In reflecting on the swine influenza campaign, microbiologist Walter Dowdle (1930–2025), who had a distinguished career at the CDC for more than 30 years, highlighted the importance of separating the science and the politics, stating, "Risk assessment estimates the probability of a pandemic, the options available for control, and the relative benefits of those options as situations change. Risk management is the political response to that assessment."¹² The error was in treating the worst-case outcome of an outbreak as destiny rather than as a scenario to be continuously tested with pre-specified thresholds for escalation, pause, and de-escalation. The events in 1976 also served as an early precursor that shaped later thinking about liability and post-licensure safety surveillance in the USA.

The 50-year question is whether the USA has the ability in 2026 to avoid the failures of swine influenza and has the institutional muscle that underpinned the successes in 1976: technical competence, stable governance, and credible communication under uncertainty. The actions of Robert F Kennedy Jr, Secretary of the US Department of Health and Human Services (HHS), illustrate what is at stake. During his first year, he undermined vaccination as a public health tool, did not prevent explosive measles outbreaks putting the USA at risk for losing its elimination status, precipitated record losses of scientific staff necessary for outbreak control and scientific discovery, oversaw the separation of WHO from the USA, and placed the HHS at odds with major medical and professional societies.^{13,14} Authoritative and impactful organisations such as the HHS require greater adherence

to evidence-based decision making and accountability to become highly reliable.¹⁵ At present, other non-government academic and public health institutions appear to be filling the void left by HHS's missteps and inactions.¹⁶

Whatever one's politics, such shocks raise a practical preparedness concern: if confronted with an infectious disease stress test such as in 1976, how would public health agencies respond? Given the disruption to the US public health system and the severed support and engagement with WHO, it is not clear that the public health systems that are meant to protect us, driven by the leadership of the federal government, are more reliable now than 50 years ago to act on early signals of disease outbreaks, have disciplined management of uncertainty, keep actions scaled to evidence, revise the response as needed, and maintain the trust of the public and medical community. Focusing on the public health fundamentals and less on the ideology is crucial for arriving at a trusted, reliable public health system the USA and the world needs.

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- 1 Sencer DJ, Millar JD. Reflections on the 1976 swine flu vaccination program. *Emerg Infect Dis* 2006; **12**: 29–33.

- 2 Dehner G. WHO knows best? National and international responses to pandemic threats and the "lessons" of 1976. *J Hist Med Allied Sci* 2010; **65**: 478–513.
- 3 Rutty CJ. Canada's vaccine legacy: influenza, polio and COVID-19 vaccine(s). RSC COVID-19 Series, publication #41. Royal Society of Canada, Sept 24, 2020. <https://rsc-src.ca/en/voices/canada%E2%80%99s-vaccine-legacy-influenza-polio-covid-19-vaccines> (accessed Feb 13, 2026).
- 4 Vellozzi C, Iqbal S, Broder K. Guillain-Barré syndrome, influenza, and influenza vaccination: the epidemiologic evidence. *Clin Infect Dis* 2014; **58**: 1149–55.
- 5 Neustadt RE, Fineberg HV. The swine flu affair: decision-making on a slippery disease. Washington, DC: National Academies Press, 1978.
- 6 Fraser DW, Tsai TR, Orenstein W, et al. Legionnaires' disease: description of an epidemic of pneumonia. *N Engl J Med* 1977; **297**: 1189–97.
- 7 Breman JG, Heymann DL, Lloyd G, et al. Discovery and description of Ebola Zaire Virus in 1976 and relevance to the West African epidemic during 2013–2016. *J Infect Dis* 2016; **214** (suppl 3): S93–101.
- 8 WHO/International Study Team. Ebola haemorrhagic fever in Sudan, 1976. Report of a WHO/International Study Team. *Bull World Health Organ* 1978; **56**: 247–70.
- 9 Report of an International Commission. Ebola haemorrhagic fever in Zaire, 1976. *Bull World Health Organ* 1978; **56**: 271–93.
- 10 US Centers for Disease Control and Prevention. Ebola outbreak history. December, 2025. <https://www.cdc.gov/ebola/outbreaks/index.html> (accessed Feb 13, 2026).
- 11 Feldmann H, Geisbert TW. Ebola haemorrhagic fever. *Lancet* 2011; **377**: 849–62.
- 12 Dowdle WR. Pandemic influenza: confronting a re-emergent threat. The 1976 experience. *J Infect Dis* 1997; **176** (suppl 1): S69–72.
- 13 The Lancet. Robert F Kennedy Jr: 1 year of failure. *Lancet* 2026; **407**: 825.
- 14 Roubein R, Sun LH, Weber L. How RFK Jr. upended the public health system. The Washington Post. Dec 30, 2025. <https://www.washingtonpost.com/health/2025/12/30/rfk-jr-hhs-secretary-vaccines/> (accessed Feb 23, 2026).
- 15 Ameaka F, Acquaye IM, Zhu A, et al. Translating high-reliability organization principles into public health: study report. Johns Hopkins Center for Outbreak Response Innovation. Dec 19, 2025. <https://cori.centerforhealthsecurity.org/translating-high-reliability-principles-to-public-health-outbreak-response> (accessed Feb 13, 2026).
- 16 Steenhuysen J. Medical groups and US states work to circumvent Kennedy's vaccine decisions. Reuters. July 24, 2025. <https://www.reuters.com/business/healthcare-pharmaceuticals/medical-groups-us-states-work-circumvent-kennedys-vaccine-decisions-2025-07-24> (accessed Feb 27, 2026).



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