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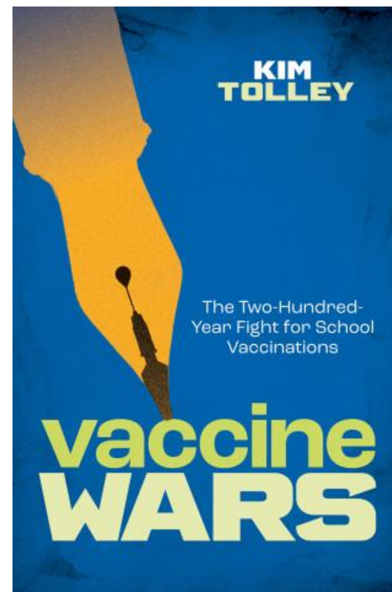

Kim Tolley's *Vaccine Wars* is a remarkable history of education, public health, and civic tensions in a democratic society. American schools have long been at the center of conflicts over epidemics and vaccines. "As sites where students are in close contact for hours each day under the same roof," Tolley explains, schools "inherently foster disease" (p. 3).

Her book is organized in two chronologically divided parts. The first traces general support for the smallpox vaccine in the mid-19th century to subsequent opposition by the late 19th and early 20th centuries. Her thematically organized chapters within this portion address safety concerns about vaccines, forms of organized dissent, lawsuits and court rulings, and examples of schools' noncompliance to vaccination mandates. The second part of Tolley's book begins with the polio epidemic. It traces a shift from broad acceptance of immunization in the mid-20th century to growing critiques of vaccines by the 1970s, and ultimately, formidable opposition by the 1990s and into the early 21st century. She argues that in both broad eras, there have been patterns of initial support for vaccines amid epidemics, leading to complacency, hesitancy, and opposition. One significant change, however, has been in how technological innovations have altered how Americans accessed information about the nature of disease and vaccines: "from newspapers, pamphlets, and books in the 19th century to radio, television, the Internet, and social media in subsequent centuries" (p. 9). Most recently, Tolley contends, partisan politics have shaped the debates over school vaccines in unprecedented ways.

Misinformation has figured prominently in exacerbating Americans' disagreements over the nature of disease, public health, and vaccines. And more generally, there is little question that misinformation has compromised the health of contemporary civic life in the United States. But what exactly is misinformation, and

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how do we know it when we see it? Thankfully, Tolley establishes a clear definition at the outset: "any information claimed to be factual that is unsupported by available evidence" (p. 13). But in our efforts to be rational and empathetic citizens, we often encounter difficulties in recognizing, refuting, and rejecting misinformation. A lot of the challenge has to do with gaps between our level of scientific literacy and expert knowledge. If we don't possess the knowledge or skill to verify a claim, how do we decide if we should trust what an expert says? And if there are competing expert voices on an issue affecting the public, which one do we choose to believe—and why? In other words, how do we distinguish legitimate claims about science and medicine in everyday life from illegitimate and even ill-intentioned ones that might classify as misinformation?

This enduring civic problem can become even more complicated when trying to attribute misinformation historically. "Historical context is important," Tolley suggests, "in evaluating whether any claim about vaccination constitutes misinformation" (p. 13). She also offers a further consideration: "Regardless of whether misinformation is circulated with intent to deceive, it contributes to public ignorance and harms the body politic" (p. 13). We can infer from these criteria that a person's or group's motivation for spreading falsehoods is less important than their negative consequences for society. Historically speaking, then, what does it mean for evidence to be "available"? Who needs to have had access to that evidence: everyone, a critical mass, or a specified subset of the population? What kinds of scientific literacy did those people need to possess to be able to accept "available evidence" as legitimate? Furthermore, how has people's tendency to restrict themselves to perspectives compatible with their preexisting beliefs—or "passive ignorance"—made them more vulnerable to misinformation (p. 51)? Tolley's fascinating history of conflicts over school vaccinations helps us appreciate more deeply some of the reasons why creating and sustaining a rational and collaborative public sphere has been so elusive.

There are instances when we want to believe that intent did matter in attributing misinformation historically. For example, Tolley explains that in the mid-19th century, the National Anti-Vaccination Society of America included doctors who thought that poor climate or unclean living conditions were the main causes of disease. In that context, anti-vaccination activism constituted "legitimate discourse" (p. 61). In the early 20th century, opponents to school vaccination requirements in California argued that smallpox spread because of unsanitary living conditions (not germs), injecting vaccines into people was not natural, and the vaccine itself introduced diseases to the body. For Tolley, such claims had become "politically useful" propaganda, because the vast majority of medical professionals had accepted the germ theory of disease (p. 61). In the mid-1950s, moreover, those campaigning against polio inoculations like Duon Miller engaged in "the deliberate production of misinformation with the aim of sowing public mistrust in the Salk vaccine" (p. 158). The U.S. Attorney General's office subsequently prosecuted Miller for criminal libel. With the benefit of historical hindsight, we can readily recognize that self-serving and even earnest dissent about the nature of disease and opposition to vaccines damaged public health. But to what extent are we justified in labeling such people as scientifically illiterate and the messages they disseminated against school vaccinations as misinformation? Should we rely on the nature of expert medical opinion in a

given time and place about the nature and spread of disease? Or should our historical judgment be contingent on how much of the general population shared the prevailing views of medical experts?

Misinformation about public health also has to do with time, particularly rates of change. As we keenly recall from the COVID pandemic, an infectious disease can spread from one person to another in mere minutes. As Tolley's account reveals, however, the public's accurate understanding of what causes disease to spread, and the consequent implication for vaccines, has taken multiple generations to evolve. School curricula often require many years to catch up to advances in medicinal knowledge as well. Furthermore, competing scientific ideas about viruses and vaccines within the medical community can take a long time to resolve. Through those years of uncertainty, unjustified claims from the lay public or political activists can fester—and foster greater popular suspicion of medical expertise. Tolley refers to misinformation from the late 20th century that vaccines caused autism that "continued to circulate on television and social media for many years, leading some to refuse vaccination" (p. 198). Indeed, viruses move far more quickly than scientific knowledge among medical experts, much less the larger public.

Much also seems to depend on the channels through which people have accessed information about public health. As Tolley vividly demonstrates, if mass media sources chose to ignore blatantly false claims about medicine and public health, then people became less susceptible to falling prey to them. In the schools' campaign to eliminate polio in the late 1940s and 1950s, for instance, the live virus contaminated vaccine samples at Cutter Laboratories that killed 10 people and paralyzed nearly 200 others. This tragic mistake encouraged some Christian Scientists to object vocally to vaccines and others to champion nondrug treatments of polio. But it also elicited misinformation in the form of Eleanor McBean's book, *The Poisoned Needle*, that rejected the germ theory of disease that had become universally accepted by the medical community. Notably, the book "received little attention from the press," which Tolley believes may have reduced its power to compromise the public's faith in vaccines (p. 157).

By contrast, the rapid proliferation of news sources and how they are disseminated through social media have allowed peddlers of medical misinformation more opportunity to damage public health through various forms of partisanship. In the 1950s and 1960s, Tolley argues, the mass media had been largely nonpartisan in forming "an information commons" about public health matters. By the early 21st century, however, social media had fostered "a much more fragmented media marketplace catering to specific interests, a market in which people selectively sought news information likely to reinforce their existing beliefs and political leanings" (p. 257). Tolley notes that the National Vaccine Information Center, and its leader Barbara Loe Fisher, comprised "a small group of highly vocal anti-vaccine activists" that threatened Americans' herd immunity against diseases like the measles (p. 233). As Tolley explains, amid California's quest to eliminate nonmedical exemptions to school vaccinations, BuzzFeed researchers found that "just a few groups were encouraging people to create automated accounts to push as many messages as possible, so that when people searched for information about S.B. 277, the first thing they encountered were posts and tweets against the bill. This coordination occurred

across multiple platforms" (p. 246). This "new era of online manipulation" appears to be patently anti-democratic (p. 246).

Indeed, the current landscape of social media seems a far cry from the "information commons" of the mid-20th century. Tolley contends that misinformation through social media have contributed to declines in school vaccination rates in the United States: "Anonymous posters on social media sites made scores of false statements, including claims that the vaccines themselves caused coronavirus, that they contained tissue from aborted fetuses, or that the new vaccines altered human DNA" (p. 266). This so-called democratization of information through social media has in fact hurt the possibility of realizing a democratic society through dialogue and with some degree of shared understanding about issues of mutual importance. Tolley concedes that "compulsory vaccination laws are an infringement on personal liberty" (p. 278). "Nevertheless, as the courts have ruled over and over again," she argues, "liberty is not absolute in a democratic society. Society's interest in protecting everyone from outbreaks of contagious disease outweighs the individual's interest in exercising personal choice" (p. 278). *Vaccine Wars* thus evokes tough and enduring questions about the extent to which schools can ever be fully democratic and whether a democratic society is sustainable. Towards the end of her concluding chapter, Tolley laments plainly that "misinformation damages our society" (p. 277). Thanks to her pioneering and thoughtful book, we gain a better understanding of why.

Reference

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About the Reviewer

Sevan G. Terzian is a professor in the School of Teaching & Learning at the University of Florida and President of the History of Education Society. He teaches graduate and undergraduate courses on the history of American education, philosophical foundations of education, college and university teaching, and foundations of research in curriculum and instruction. Sevan's scholarly research has investigated: the history of the American high school; the history of science, gender, and education in the postwar era; the racial and cultural dimensions of giftedness in 20th century American education; the history of technology in education; and the beliefs and practices of highly effective college instructors. He has published two books: *Science Education and Citizenship: Fairs, Clubs, and Talent Searches for American Youth*, and *American Education in Popular Media: From the Blackboard to the Silver Screen* (coedited with Patrick Ryan). Some of Sevan's research has also appeared in journals including *Teachers College Record, History of Education Quarterly, Science Education, Paedagogica Historica,* and *Public Understanding of Science.* He is currently writing a book on how cultural constructs of time have shaped American educational thought and practice over the past 400 years.

About the Book Author

Kim Holley is a historian of education and professor emerita at Notre Dame de Namur University in Belmont, California. She is the author of several histories of education including *The Science Education of American Girls* (2003) and *Professors in the Gig Economy: The Unionization of Adjunct Faculty in America* (2018). In 2018 she served as president of the History of Education Society.

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