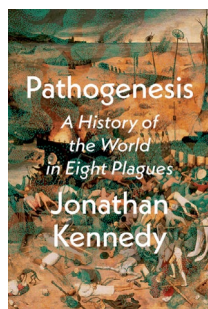


## Sick again!

 Check for updates**Pathogenesis:  
A History of the World  
in Eight Plagues**By Jonathan Kennedy  
CROWN: 2023.  
304 PP. \$30.00.

**N**early 50 years ago, William McNeill published *Plagues and People*, a classic survey of diseases in human history. In the past three years, the important role of pathogens in economics, politics and all forms of human social interactions has been made mainstream by the COVID-19 pandemic. In an insightful new book, Jonathan Kennedy reviews scientific developments of impacts of pathogens on human history and provides important new insights that enhance and build upon the ideas that were initially and cogently developed by McNeill.

The central thesis of *Pathogenesis* is that pathogens are responsible for many unexplained disappearances and declines of populations throughout human history. Despite this captivating claim, I found myself sceptical throughout the early chapters of the book owing to the limited direct evidence in support of some of the arguments. For example, Kennedy posits that pastoralists replaced hunter-gatherers after developing immunological resistance to pathogens they acquired via spillovers from early domesticated species; subsequent epidemics in hunter-gatherers enabled pastoralists to move in and take over their land. Although these arguments are consistent with similar patterns of species persistence and disappearance during the great faunal interchange when the Isthmus of Panama rose up to join North and South America, direct evidence in support of these interesting hypotheses is lacking. Conversely, the logic and support for Kennedy's arguments were clearer for some claims based on evidence from ancient DNA and demographic records – for example, the records that document the declines of the Maya people when smallpox and measles were introduced during the colonial period.

The writing often moves at a breathless pace. Just 28 pages in a chapter on 'Ancient Plagues' covers all of Greek and Roman history plus the rise of Christianity and Islam. The frantic rush through human history leads to repetition, including blaming disease for everything: from the Spanish colonization of the Americas (smallpox and measles) to Napoleon's failure to quell the slave uprising in Hispaniola and form a base for the colonization of the USA from New Orleans (yellow fever). Although I appreciated reading a history book in which the key actors in history are pathogens and not just the 'great men', I found the assertion that "Pathogens played a pivotal role in every historical transition" overly simplistic. History has to be more nuanced than this. We know that competition, resource limitation and climate have as large a role in evolution as pathogens (and predators), and I strongly suspect that this is also the case with human history. Nonetheless, Jonathan Kennedy's book does an excellent job of addressing the 50 years of relative silence about the role of disease in human history that followed the publication of *Plagues and People*.

As with many historical studies, I found that the book ignored the large body of work on the population dynamics of infectious disease. For example, the book did not discuss several fundamental epidemiological concepts such as the basic reproductive number ( $R_0$ ) or herd immunity. I appreciate that Kennedy aimed to write for a broad audience, but these concepts were widely discussed and confused during the COVID-19 pandemic and omitting them here misses an opportunity to educate people while illustrating their utility in sharply describing the role of pathogens in history. In my view, these omissions reflect a broader issue in which the fields of medicine and medical history fail to recognize the relevance of work on the mathematics of infectious disease dynamics. I find myself yearning to read scholarship that blends history with insights from population biology (for example, Anderson and May's canonical *Infectious Diseases of Humans: Dynamics and Control*) with complexity science (for example, Peter Turchin's *Historical Dynamics: Why States Rise and Fall*) and political history (for example, Niall Ferguson's *The Square and the Tower: Networks and Power*).

Kennedy condenses a huge amount of information into *Pathogenesis* and does so in a very

vivid and engaging fashion. As a social scientist who has read deeply in anthropology and human evolution, Kennedy misses the mark on some epidemiological details (for example, the difference between immunity that is acquired by an individual over their lifespan versus by a population over time). Readers who are more interested in the mechanisms and disease biology may consider reading a complementary book that has recently been released by Johns Hopkins Press, *Fatal Jump: Tracking the Origins of Pandemics* by Leslie Reperant. Reperant makes a similar set of arguments to Kennedy but approaches the subject as a veterinary scientist who is well-versed in scientific advances in this area. Both approaches have a lot to offer and I strongly recommend both books as convincing arguments for COVID-19 being neither unexpected nor unusual, and – particularly – not the last major pandemic to impact humans. Both books provide direct and indirect insights into how we need to invest resources in ways that minimize damage from future pandemics, not least by being better prepared to identify and stop novel pathogens before they become fully established in either the human population or in domestic livestock.

In conclusion, *Pathogenesis* is an excellent read, thought provoking and engaging in ways that are both eloquent and insightful. I will still encourage students of infectious disease to read *Plagues and People*, but I will also strongly recommend that they read *Pathogenesis* and *Fatal Jump*, as this will fill out the details in areas in which sceptics might require more details of the underlying scientific mechanisms. I suspect both books will educate, excite and stimulate a deeper appreciation of the role that pathogens have had in human history for at least the next 50 years.

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