

Pandemics and Epidemics

Financial and Economic Effects



National Museum of Health and Medicine

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DURING THE FIRST SEVEN WEEKS of 2020, despite ominous news from China, Italy and Iran about the spread of the COVID-19 virus, US stock indexes hit new all-time highs. Then, in little more than a month, the market crashed. By March 23, the Dow Industrials dropped 37%; the S&P 500, 34%; and the NASDAQ Composite, 30%.

It seemed that the markets suddenly realized that the virus's spread to the United States would cause widespread business shutdowns, closings of schools and universities, and stay-at-home orders

from public officials. More than 20 million American workers, a seventh of the labor force, would apply for unemployment benefits between mid-March and mid-April. All of that happened. A major recession, if not a depression, seemed imminent.

Then, in response to the crisis, the Federal Reserve, Congress and the Trump administration implemented a number of unprecedented monetary and fiscal measures to alleviate the public-health and economic crises. By mid-April, as the numbers of infections and deaths from the virus mounted daily, the markets staged a sharp recovery. In less than a month, from the March lows the Dow rose 30%, the S&P 29% and the NASDAQ 26%. Justified or not—only time will tell—the markets' collective wisdom seemed to think that the virus would soon go away and the government's drastic measures would soon bring a sharp economic recovery.

Is this what typically happens during epidemics and pandemics? Because they don't occur often anymore, most people have not experienced them and don't have a clue as to what is typical. But they have happened often enough in history, which can offer some guidance. Here, seeking that guidance, we examine a number, but by no means all, of the epidemics and pandemics that have occurred over the course of US history.

Yellow Fever Epidemic (Philadelphia, 1793)

The epidemic hit what was then the nation's capital in late summer and lasted several months. The most likely source of the outbreak is that the infection was brought to the city by refugees fleeing a slave revolt in Santo Domingo (modern-day Haiti), where mosquitoes made

Emergency hospital during the 1918 influenza epidemic, Camp Funston, Kansas.

the fever a regular occurrence. Between August 1 and November 9, the fever killed more than 5,000 Philadelphians—about 10% of a population of 50,000 before the outbreak induced some 20,000 residents to flee. Among them was President George Washington, who went home to Mount Vernon in early September.

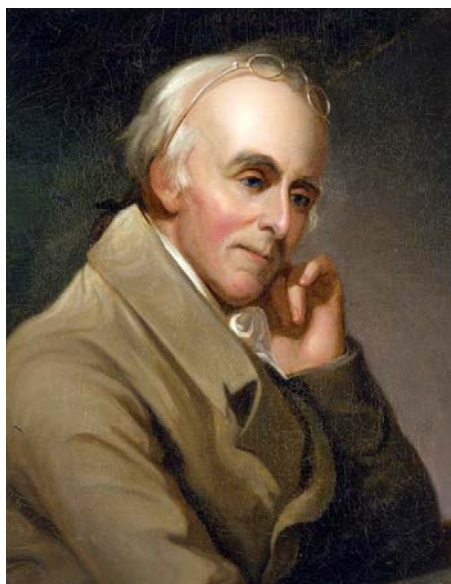
One person who did not flee in time to avoid the infection was Treasury Secretary Alexander Hamilton, who caught the fever in early September. His wife was also stricken. Both were quickly cured by a cold-bath treatment recommended by Dr. Edward Stevens, an old friend. But when the Hamilton family went to Albany, New York, to recuperate at Mrs. Hamilton's father's home, they were almost denied entry to the city because of unwarranted fears that they would bring the malady with them.

Philadelphia's most eminent physician, Benjamin Rush, used a harsher treatment than Stevens' method, blood-letting and mercury purges, and lost many patients. The two doctors became involved in a public debate over whose treatment was best. In 2020, we have witnessed efforts to keep possibly infected outsiders away as well as debates over treatments. They are nothing new.

Merchant-financier Stephen Girard stayed on in Philadelphia, using some of his fortune and managerial skills to tend to the sick. He espoused the Stevens treatment and became a hero to Philadelphians.

During the epidemic, the prices of the young nation's two most important securities, US 6% bonds (Sixes) and shares in the Bank of the United States (BUS), both dipped slightly in early August before rebounding and even increasing until quotations for the Philadelphia market ceased in early September. Specifically, Sixes dropped from \$90 (per \$100 bond) to \$88.75 before hitting \$91.67, while BUS shares went from \$420 to \$412 to \$428, suggesting a "flight to quality" scenario as some wealthy Philadelphians on the hoof sold real estate and specie for more liquid and transportable safe assets. Unlike 2020, the securities market did not crash. It simply shut down during the epidemic.

The reaction in the New York market, where both securities also traded, was similar. When quotations began again in Philadelphia on January 1, 1794, BUS shares were at \$440 in Philadelphia and \$444 in



Independence National Historical Park

Portrait of Benjamin Rush, Philadelphia's most eminent physician during the yellow fever epidemic of 1793, by Charles Willson Peale, circa 1818.

New York, and Sixes were at exactly \$90 in both markets, suggesting that the temporary cessation of trading in Philadelphia did not damage market integration. In fact, Philadelphians eager to buy or sell those securities probably just did business via New York during the hiatus.

Yellow Fever Epidemic (New York City, 1798)

Outbreaks of yellow fever were an almost annual occurrence in the decade 1795–1804 and reached epidemic proportions in New York similar to Philadelphia's outbreak five years earlier from July to October 1798. Some 2,100 of the city's population of about 35,000 died of the fever that year. The toll included prominent citizens such as Anti-Federalist Melancton Smith and printer Thomas Greenleaf. Street vendors hawked "Coffins—coffins of all sizes." Many of the dead were buried in mass graves on what is now the site of Washington Square Park, which then was on the outskirts of the city.

In 1799, the city's two chartered banks, the Bank of New York and the branch of the Bank of the United States, relocated from Wall Street to Greenwich Village, also on the outskirts, during the expected fever months. The sites of the banks became the West Village's Bank Street.

That same year, the state chartered the Manhattan Company, which proposed to alleviate fever outbreaks by supplying

purier water to the city. Sponsored by Aaron Burr, its real purpose was banking. Burr inserted a clause into the charter that allowed any surplus capital the company had to be "employed in the purchase of public and private stocks, or in any other moneyed transactions or operations" that were legal. The Manhattan Company was supposed to supply a lot of water and do a little banking. Instead, it supplied little water and did a lot of banking.

Securities prices rose during the epidemic and by December were significantly higher: Bank of New York from 132% to 134% of par; BUS from \$464 to \$500; US Deferreds from \$63.75 to \$67.50; US Sixes from \$73.75 to \$80; US Threes from \$45 to \$50.

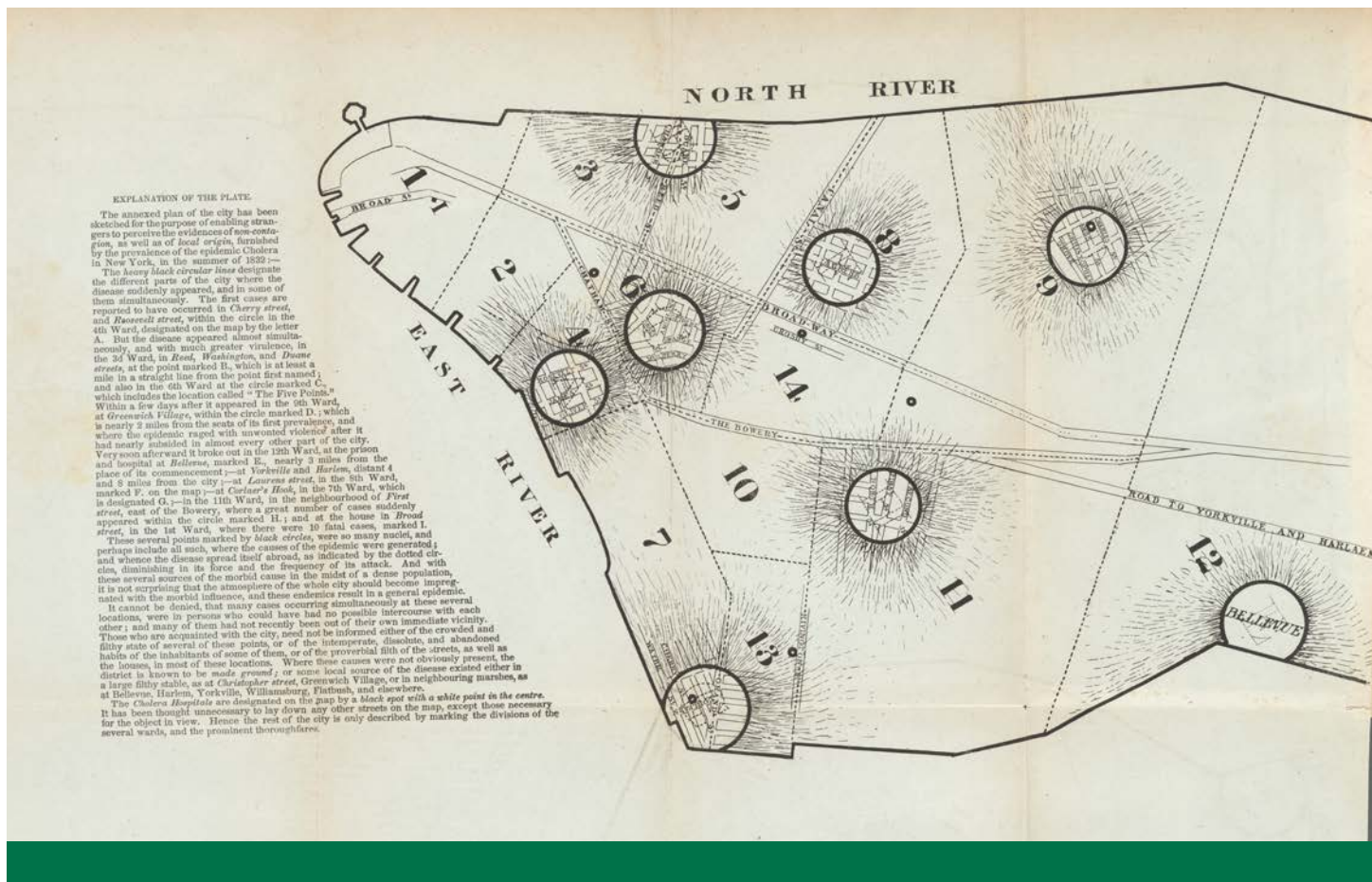
Cholera Epidemic (New York City, 1832)

When cholera broke out in 1832, New York City's population had increased to 250,000, many of them recent immigrants living below 14th Street. The epidemic killed some 3,500, a mortality rate equivalent to more than 100,000 when applied to the city's current population. When it peaked in Manhattan in July, President Andrew Jackson was in the process of vetoing Congress's bill to re-charter the second Bank of the United States and completely repaying the US national debt.

The most liquid US government bond paid 5% interest per year. While the cholera epidemic raged, leading to a mass exodus from the city, the Fives not only continued to trade, they traded above par, in a tight range from \$103.75 to \$104.125 (per \$100 principal) throughout the summer. Most cholera victims were poor and not investors, but the disruption of the city's usual business was palpable. Most trades, though, were over-the-counter and through brokers, who, like many modern knowledge workers, could conduct business even when out of the office or out of town.

Unsurprisingly, then, the stocks of private commercial banks, like the Bank of America, Butchers and Drovers, and Chemical, also remained range-bound all summer, as did the shares of New York, Neptune, Merchants Fire and other insurers. New York Gas Light also traded in a range between \$145 and \$155 throughout the summer.

Railroads exhibited a more complex pattern. Harlem dipped slightly at first, from \$105 to \$95.50 per share, in late July



Cholera Map of New York City, 1832.

before rebounding to \$103 by the end of August. The Mohawk and the Paterson and Hudson Railroads, by contrast, both dropped by \$15 to \$20 per share over the summer and recovered much more slowly, not returning to their 1832 highs until April 1833. Many railroad stocks were already considered “fancies,” the newly launched playthings of speculators, so it is not clear that any of those movements had anything to do with cholera.

Massachusetts Scarlet Fever Epidemic (1858–1859)

Scarlet fever, nee scarlatina, killed 2,089 people, almost all younger than 16 years old, in Massachusetts between December 1858 and December 1859. According to the 1860 Census, the population of the state was about 1.2 million, of whom about 350,000 were under 16. Some of the children were employed, but the labor force exceeded 450,000, so the shock was more emotional than economic.

Indeed, the Boston stock market was in

bull mode throughout 1859. While most bank and some insurance stocks remained range-bound, some insurers, including American, Boston, Boylston, City and Commercial were up strongly. The Boston and Lowell Railroad increased from \$89 to \$98 per share over the year, and the Boston and Providence and Boston and Worcester railroads were likewise steadily but modestly up.

The biggest gains were in manufacturing. Amoskeag was up from \$890 to \$1,000 per share over the year, Appleton from \$950 to \$1,000, Bates from \$85 to \$106, Boott from \$470 to \$725, Boston and Roxbury Mill Dam from \$29 to \$50 and Boston Duck from \$375 to \$500. If the death of young workers, or potential workers, put an upward strain on wages in 1859, it was clearly swamped by other effects.

How could life go on while thousands of children died and thousands more lay stricken? A better question might be, how could it not? More people per 1,000 died at each age then, especially the younger ages. Death was a simple fact of life that people

suffered through with lots of prayer and sex for reproductive purposes. Families that lost children usually tried to have more of them.

The government’s role in the scarlet fever epidemic, like the yellow fever and cholera epidemics, was limited by constitutions, precedent and expectation. Every family was left to its own devices. Medical treatment was palliative at best. Those obviously ill were quarantined, but healthy people continued business as usual. No hope for a miracle cure was held, and any attempt to shut down Boston or other commercial centers to stop the spread would have been met with derision and then open rebellion. Even in small towns like Deerfield, local factories remained open, making cutlery in Deerfield’s case.

The frequently occurring epidemics of 18th- and 19th-century America, like the ones sketched above, had limited economic and financial effects. In part, this was because they were localized epidemics over in a few months, not pandemics affecting every place and everyone. Most



Officers of the Seattle Police Department wearing masks during the Spanish influenza pandemic, December 1918.

securities holders—individuals such as President Washington and institutions such as the Bank of New York—were wealthy enough to relocate, leaving most of the suffering and death to the laboring classes and the poor. In 1793, if securities prices fell or were unavailable in Philadelphia, an investor could sell in New York, which had no epidemic and where markets remained open. Such cross-market arbitrages prevented crashes in a city hit by an epidemic.

In short, the decentralized nature of securities trading systems, along with different attitudes toward death and limits on governmental powers, minimized the financial and economic fallout of public-health crises. All early American investors had to fear was the epidemic itself, not lost liquidity or government-mandated shutdowns of large sectors of the economy.

Spanish Flu Pandemic (1918–1920)

This worldwide pandemic was quite different from earlier localized epidemics.

Across the world, the flu killed about 40 million people, or 2% of the world's population. Since it is estimated that a third of that population became infected, the death rate for those infected was about 6%.

In the United States, about 550,000 died of the flu, or half a percent of the US population. A first, mild wave of infections came in the spring of 1918, followed by a more deadly one from September 1918 to January 1919. One of those killed was Frederick Trump, grandfather of President Donald Trump. President Woodrow Wilson caught the flu but survived, albeit impaired, as did Walt Disney, General John Pershing and the leaders of France and the UK, Clemenceau and Lloyd George.

World War I was in its last year in 1918, and movements of soldiers internationally and domestically helped to spread the flu virus. The overlap of the war and the pandemic makes it difficult to isolate the economic and financial effects of each. But economist Robert Barro and collaborators took a stab at separating the war and flu effects by means of econometric

analysis. They estimated that both war and flu depressed real GDP growth and consumption spending, and raised inflation in both the world and the United States. The flu was less important than the war in these outcomes, but not insignificant.

They found for the United States that the flu by itself reduced real stock returns by seven percentage points and returns on short-term government debt by 3.5 percentage points, while it raised inflation by five percentage points. These results are broadly consistent with the Dow Jones average increasing in nominal terms by 10.5% in 1918, when the CPI inflation rate was above 15%, and both annual real GDP growth overall and per capita being less than 1% during the years 1918–19.

Asian Flu Pandemic (1957–1958)

This pandemic began in China in late 1956 or early 1957, and by the summer of 1957 it began to spread around the world. Ultimately, it would kill an estimated 1–2 million people. By October, it was in full

INFLUENZA PANDEMIC MORTALITY IN AMERICA AND EUROPE DURING 1918 AND 1919

DEATHS FROM ALL CAUSES EACH WEEK
EXPRESSED AS AN ANNUAL RATE PER 1000

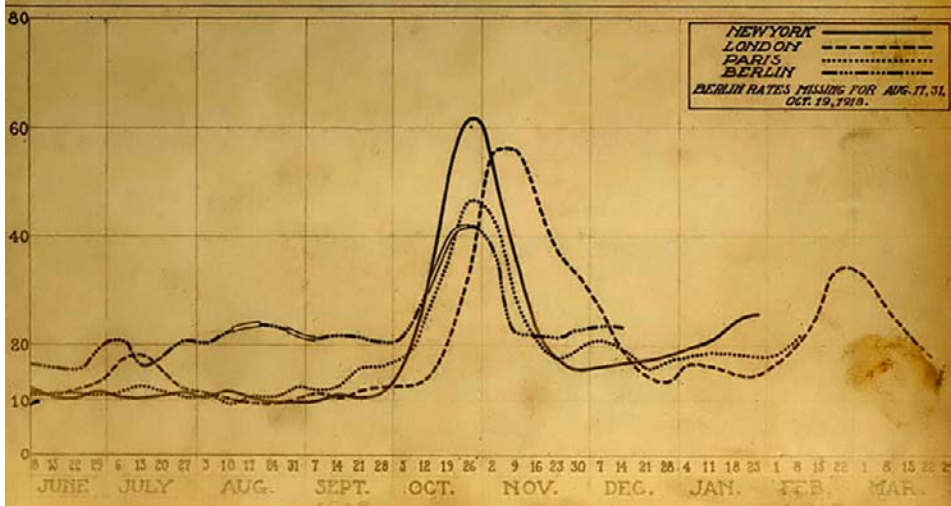


Chart showing mortality from the 1918 influenza pandemic in the United States and Europe.

swing in the United States. The first wave that fall affected mostly school children, and some schools were closed. But few children died. A second wave in early 1918 was more deadly, affecting in particular pregnant women and elderly people with pre-existing conditions. Estimated US deaths ranged from 70,000 to 116,000.

In 1907, the Dow Industrials peaked on July 12 and then dropped 19.4% to a low on October 22. Curiously, the flu outbreak typically was *not* cited by the media as a factor in the market downturn. It soon became apparent that the US economy entered what would prove to be a mild recession in August 1907, one that would last through April 1908. When the recession began, the pending flu problem was known to health experts and officials, and they were on top of the flu epidemic before it hit the United States. Indeed they already had developed a vaccine, which was well reported in the press. Even though supplies of the vaccine were initially limited, undoubtedly it was encouraging to investors and others to know that a vaccine existed.

The sharp stock market decline began before the recession and before the public, if not scientists and officials, became aware of the flu problem. It thus proved

its worth as a leading indicator. Better reasons for the late October lows were a confrontation that fall between federal officials and Arkansas's governor over the integration of public schools, and especially rising Cold War tensions. On October 4, the Soviet Union successfully launched its Sputnik, the first man-made satellite to orbit the Earth, prompting considerable American angst and investor consternation. Later that fall, President Dwight Eisenhower suffered a mild stroke, and the failure of an American test rocket put a damper on the market's recovery from its October low.

Lessons

No two crises are alike. Some contagions infect fewer people than others. Some are deadlier than others, and some spread more easily. Some engulf a city but leave other areas unscathed and able to help. Others hit large swathes of continents, hemispheres, even the entire globe, if not simultaneously then, in our increasingly integrated world, in rapid succession. Securities markets have always tended to be good leading indicators of future earnings expectations and will move rapidly up and down as new information

influences those expectations. Volatility will be highest when political decisions influence earnings expectations most, as they have during the present pandemic. \$

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Sources

- Barro, Robert J., Jose F. Ursua and Joanna Weng, "The Corona Virus and the Great Influenza Pandemic: Lessons from the 'Spanish Flue' for the Corona Virus's Potential Effects on Mortality and Economic Activity." National Bureau of Economic Research Working Paper 26866. March 2020.
- Burrows, Edwin G. and Mike Wallace. *Gotham: A History of New York City to 1898*. Oxford: Oxford University Press. 1998.
- Centers for Disease Control and Prevention (CDC). "1957-1958 Pandemic H2N2 Virus." <https://www.cdc.gov/flu/pandemic-resources/1957-1958-pandemic.html>.
- Swedlund, Alan C. and Alison K. Donta. "Scarlet Fever Epidemics of the Nineteenth Century: A Case of Evolved Pathogenic Virulence?" in *Human Biologists in the Archives: Demography, Health, Nutrition and Genetics in Historical Populations*, ed. D. Ann Herring and Alan C. Swedlund. New York: Cambridge University Press. 2002.
- Sylla, Richard E., Jack Wilson and Robert E. Wright. "Early US Securities Prices." EH.NET. <http://eh.net/database/early-u-s-securities-prices/>
- Wilford, John Noble. "How Epidemics Helped Shape the Modern Metropolis." *The New York Times*. April 15, 2008.
- Wright, Robert E. and David J. Cowen. *Financial Founding Fathers*. Chicago: University of Chicago Press. 2006.