

PART 2

The 1918 Influenza in Missouri: Centennial Remembrance of the Crisis

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Introduction

2018 marks the centennial of the 1918 influenza epidemic, the worst medical crisis in Missouri's history. Although influenza decimated each of the state's eight regions,¹ Missouri's military personnel and its cross-state sibling cities St. Louis and Kansas City absorbed the epidemic's worst blows. This article, second in a two-part series, will chronicle the experiences at Missouri's Army base, Jefferson Barracks, and its World War I field hospital staffed by St. Louisans, Base Hospital 21; review the brutal impact of influenza on the populations of St. Louis and Kansas City; and discuss the effectiveness of public health responses in these cities.

Flu Hits Military Barracks

In the St. Louis area, the first cases of influenza were reported at Jefferson Barracks, the nation's oldest military installment west of the Mississippi River, 17 miles south of downtown. Two hundred thousand enlisted men passed through the base during World War I. On October 1 the first influenza cases were identified; within a week 800 soldiers were hospitalized.² Assistance was requested from the Red Cross in St. Louis, and women received hurried training at Barnes Hospital as nurses' aides. Fortunately, despite its initial rapid spread the epidemic was controlled quickly. In total there were more than 2,000 influenza cases at Jefferson Barracks, a much lower figure than at many other military bases in the country. Dr. C. E. Freeman, the

Barracks' chief military officer, attributed this better-than-expected outcome to emergency aid from the Red Cross nursing staff.

Missourians also valiantly battled influenza "over there." At the onset of World War I the Army and the American Red Cross created 50 base hospitals, designated as official military units, utilizing personnel from university medical centers. Physicians and nurses from Washington University immediately agreed to staff Base Hospital 21, one of the first six base facilities mobilized in the war. The unit was stationed at a 1,350 bed hospital in Rouen, France.³ Base Hospital 21's medical services were directed by Lieut. Col. Walter Fischel, brother of Dr. Ellis Fischel who later established a cancer center in Columbia. Patient volume was brisk: there were 500-600 admissions daily. The 61,000 admissions during the war were evenly divided between surgical and medical cases.⁴ The most common diagnoses were gangrene or nerve gas poisoning but Base Hospital 21 also served as a treatment center for influenza patients.⁵ (Figure 1) In October, 1918, the hospital's daily census crested at an astonishing 1,950 patients, coinciding with the peak of the influenza epidemic in Europe.

In 1918 St. Louis, population 687,000, had a distinctly different heritage and culture than its cross-state rival 340 miles upriver, Kansas City, home to 248,000 citizens. Established in 1764 as a European outpost, St. Louis was the nation's fourth largest city in the early twentieth century. On the western side of the state, Kansas City was not chartered until 1850. Fortunately its founders rejected two of the initially proposed names for the new town, Possum Trot and Rabbitville. By 1918 St. Louis had hosted an Olympics and a World's Fair and had become one of the largest industrial centers in the country, but Kansas City was still considered a wide-open western boom town. If St. Louis was the older, famous, urbane Missouri sibling, Kansas City was its rambunctious younger brother with great potential but still-untamed behavioral issues, as will be discussed.



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Figure 1. Surgical Ward, Base Hospital 21 in Rouen, France 1918.

schools, theaters, moving picture houses (in the parlance of the day) and places of amusement (Figure 3). Public gatherings of more than 20 persons were prohibited. The next day closure orders expanded to include playgrounds, library reading rooms, fraternal lodges, pool halls, and Municipal Court. Even churches were closed, for the first time in the city’s history. The use of streetcars was limited. Hours for busy downtown department stores, including Famous-Barr, were restricted. A staggered work schedule was implemented at factories to reduce streetcar

St. Louis

In late September St. Louis hoped to avoid the devastating experiences recently reported in eastern cities. The City Health Commissioner, Dr. Max Starkloff (Figure 2), son of a Civil War surgeon and great grandfather of the founder of the Starkloff Disability Institute, was a clear-headed, effective, and forceful leader during the emergency.^{6,7,8} Mayor Henry Kiel granted unprecedented authority to Dr. Starkloff to implement closures of public places. On September 21, facing the inevitable arrival of the epidemic, Starkloff advised the public to avoid crowds, to get as much rest as possible, and to abstain from alcohol.



Figure 2. Dr. Max Starkloff, St. Louis City Health Commissioner during the 1918 influenza pandemic.

Once cases were confirmed in the city, he was authorized to “issue public health edicts and impose heavy fines on physicians who fail to report influenza cases.”

On October 7 Starkloff sprang into action and, as described by Appel, began “shutting down the city”⁶ by closing

crowding.⁷

The church closure order was protested by Archbishop (later Cardinal) John J. Glennon to no avail, leading him to suspend temporarily the obligation of Catholics to attend Mass weekly. Eventually churches were allowed to reopen, with strict attendance limits. Father Frederick Holweck, pastor at St. Francis de Sales Church, was turned in to the St. Louis police after 200 parishioners were seen in his church, a violation of the city’s anti-crowding ordinance. Father Holweck explained that many worshippers had snuck in through the church’s side windows out of his view. Charges were not pressed. Ironically, despite the severe restrictions placed on houses of worship, saloons were allowed to remain open throughout the epidemic (in both St. Louis and Kansas City), three months before the Volstead Act established prohibition.

The epidemic continued for weeks longer than had been expected. In the face of intense pressure from business interests, restrictions were relaxed. On Armistice Day, November 11, when the streets were filled with exuberant citizens celebrating the war’s end and “church bells ran nonstop,” Starkloff allowed merchants to sell American flags, but only on the sidewalks outside their stores.⁸

Throughout the darkest days of the epidemic, public health authorities received critically important assistance from the American Red Cross (ARC). Surgical dressings, influenza masks, clothing, and hospital supplies were produced by ARC volunteers. The ARC women’s motor corps transported health care personnel and patients, including ill cross-country travelers who were picked up at Union Station and taken to nearby hospitals (Figure 4).

More than a million four-page informational pamphlets, containing such pithy advice as “cover up each cough and sneeze, if you don’t you’ll spread disease,” were distributed to the public. The St. Louis Red Cross chapter was so effective during the 1918 influenza epidemic that almost a century later it was described as a “model chapter.”⁹

The medical community in St. Louis was inundated by influenza victims. At Barnes Hospital, 410 influenza cases were admitted including nine pregnant women, six of whom died. Among 71 patients at Barnes who had frank pneumonia there were 27 mortalities. Ten of the hospital’s 23 residents (so-called because they resided at the hospital throughout their training periods) developed influenza, one of whom, a stalwart young man, succumbed. Nurses fared better: among the 57 who became ill only one developed pneumonia and none died, a finding attributed at the time to mandatory immediate bed rest.¹⁰

A few scientific observations were reported by academicians, although research opportunities were curtailed by heavy clinical responsibilities. Dr. John Zahorsky, Director of Pediatrics at Saint Louis University School of Medicine, reported that his young patients fared relatively well: almost all had mild, self-limiting illnesses.¹¹ At Jefferson Barracks, psychiatrist Dr. F. M. Barnes noted a “usual number of deliria... but only one case of a true psychosis.”¹² The most notable academic contribution was made by Dr. Eugene Opie, Chair of Pathology at Washington University, who led an Army commission assigned to study pneumonia at military camps. Dr. Opie published a book describing his commission’s seminal research into secondary bacterial pneumonia.¹³

Kansas City

The first influenza cases in Kansas City were reported at the Sweeney Automobile School, a private facility converted to military use, during the last week of September. Within a week 800 fell ill. In all, 2,300 of 3,000 Army recruits studying to become mechanics developed influenza and 15 died. The first civilian cases were reported across the street at Fred Harvey’s restaurant in Union Station on September 27.¹⁴ Initially all influenza patients in Kansas City were treated at General Hospital, the predecessor of Truman Medical Center. However, after General filled to capacity St. Mary’s Hospital was asked to open its doors to influenza victims. All of the nursing sisters at St. Mary’s, each of whom worked 24 hour shifts, developed influenza.



Figure 3. “Life’s Darkest Moment” *Kansas City Times*, October 19, 1918.

Sisters Mary Cypriana Mertens and Mary Antonia Schlochtermeyer and the Reverend Father Edmund Joseph Unruh all died from influenza acquired in the line of duty.¹⁵

In Kansas City the implementation of epidemic control measures was impacted substantially, in a negative way, by local political dynamics. Although St. Louis Mayor Kiel was accused by some of being a machine politician, a historian concluded that “St. Louis fought the epidemic without political involvement.”¹⁶ This certainly was not the case in Kansas City, which was in a league of its own with regard to municipal corruption.

For several decades in the late 19th and early 20th centuries political bosses ruled the city. According to the *Kansas City Star* in 1918, “practically every member of the health and sanitary departments (held) their jobs by the grace of the bosses.” Further complicating matters, in 1918 Tom Pendergast and Joe Shannon had reached a “50-50 agreement” to share power with the result that public board members were split in their allegiances. The palpable animosity among board members severely hampered an effective public health response. A detailed description of this dysfunctional situation is provided by Sykes-Berry.¹⁵



Figure 4. American Red Cross workers, St. Louis 1918.

The key figures in Kansas City's highly politicized public health squabble included the city's two top health officials, Dr. A. J. Gannon, Director of the Health Department's Contagious Diseases Department and Dr. E. H. Bullock, Kansas City Health Director and Superintendent at General Hospital; Mayor James Cargill; and W. T. Motley, a non-physician who was president of the Hospital and Health Department. Physicians at General Hospital served on an advisory board, but their advice often went unheeded. Mayor Cargill initially sought political cover from angry businessmen, who faced financial losses, by delegating controversial decisions to the advisory board. Subsequently he accused the Board of "incompetence" and overturned its decisions.^{15,16}

Early in the epidemic Gannon sought to implement a number of measures but was overruled and publicly criticized by Motley who initially supported Bullock, who issued his own proclamations. Daily newspaper headlines trumpeted the arguments among these factions. Gannon became a scapegoat for the epidemic and, in a profane shouting match at a public meeting on November 26, was dismissed from his position. The public's frustration was evident: a *Kansas City Star* editorial described "the utter futility of the present hospital and health board coping with the influenza epidemic so long as it is a politically controlled body and forced to accept the dictates of political bosses."

Despite the public authorities' disagreements (one alderman called a ban of public meetings "Hun propaganda"), most of the same measures undertaken in St. Louis were implemented in Kansas City. Public schools were closed on three separate occasions (no other

city in the country closed schools more than twice.) On October 10, classes at three dental schools and eight barber colleges were suspended. The latter were considered especially high-risk environments given that one towel typically was used on up to 50 clients. Spitting in public was declared a misdemeanor subject to arrest.^{15, 16}

In addition to official closures and restrictions implemented by city government, general advice and recommendations from both the medical community and the lay public abounded. Dr. Gannon "believe(d) the epidemic had its start (here) by girls kissing soldiers in the Army schools and cantonments ... There

is a lot of kissing ... and if a ban should be placed on it there would be less influenza."¹⁶ Gannon also offered the following advice: "stay out of crowds, avoid dust, take laxatives, drink plenty of water, and spray (the) nose with dilute Listerine or salt water." He imputed a preventative role for garlic and onions, based on the lower incidence of disease in the city's Little Italy district. Gannon required saloons, soda fountains, and restaurants to close for 30 minutes twice a day to boil their dishes in soda and water. He suggested fumigation of schools and factories with formaldehyde candles, and recommended the use of disinfectant finger bowls for cashiers.^{15,16}

His adversary Dr. Bullock recommended that citizens spend the nights on their sleeping porches. Bullock and Gannon both believed incorrectly that "freezing weather and rain would eliminate the influenza epidemic by clearing the air." Dr. J. D. Griffith suggested consuming a teaspoon of soda in boiled water three to four times a day. As was the case elsewhere in the country, authorities insisted on the use of cotton masks for everyone who came into contact with the public; these masks were ineffective. In 2010 Dr. Charles White (1905-2014), who began his medical practice in Kansas City about a decade after the 1918 epidemic, told the authors that in his early years he and his colleagues "used to come up with very elaborate treatment protocols; of course there was no scientific basis for any of it." The same statement is applicable to many of the influenza prevention strategies promoted in 1918.

The general public joined in advocating a variety of practices to prevent influenza: wearing skunk oil vials around the neck; smoking; drinking; eating rock candy; and placing sliced onions on window sills. One

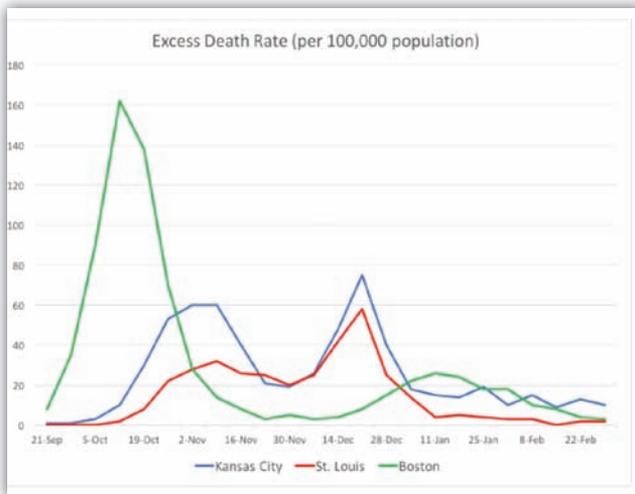


Figure 5. Weekly excess death rate per 100,000 population in Kansas City, St. Louis, and Boston during the 1918 influenza pandemic.

Setting	Influenza/Pneumonia Deaths, last 4 months of year	Excess deaths over baseline	Mortality rate/100,000	Mortality ratio 1918:1915	Mortality above rural (%) ²	Rank among 49 US Cities
Missouri						
-Total ³	12,250	10,657	476	3.3		
-Excluding large cities	7,643	6,743	339 ⁴	N. A.	N. A.	
St. Louis	2,883	2,407	537	3.4	21	32
Kansas City	1,724	1,507	718	4.1	41	17

1. data are from 1918
 2. rural defined as population <100,000
 3. data include figures from St. Louis and Kansas City
 4. estimate
 N.A.: not available
 Sources: Mortality Statistics 1919²⁰; Hatchett¹⁹

lady ate a cake of yeast a day as a prophylactic. Although she was spared from influenza, she experienced severe abdominal pain, bloating and eructation; her friends told her she was “rising.” In 1918 saloons lined the Missouri side of State Line Road; on the other side of the street in Kansas, the sale of alcohol would not be legalized until 1948. Many of these establishments advertised prophylactic quinine and whiskey to their patrons.^{15,16}

As in St. Louis, community volunteer organizations in Kansas City played a crucial role in responding to the epidemic. The city’s first meaningful action was taken by the Chairman of the Kansas City Chamber of Commerce, Bernard Parsons, who summoned the Mayor, the ARC, the Hospital and Health Board, and leading businessmen to action. The ARC volunteered the services of

its personnel and the use of all its facilities and donated supplies valued at thousands of dollars to General Hospital. The Visiting Nurses Association (VNA) staff was mobilized into service immediately. VNA nurses made 4,392 visits to 1,254 influenza patients in the city, but there remained a critical nursing shortage. Mrs. Harry Mather, nursing director of the ARC, requested volunteer nurses’ aides from the general public, stating “they need have no experience, simply good health and ability to work long hours.”¹⁵ Although Kansas City (and St. Louis) would not desegregate until decades after the epidemic, and trained black nurses were rejected for service in World War I despite a desperate need, General Hospital requested and received much-appreciated service from black nurses during the height of the influenza crisis.¹⁵

Outcomes

Abundant available epidemiological data paint a clear, if grim, picture of influenza’s toll in Missouri’s two largest cities (Table 1). St. Louis reported 31,693 influenza cases and 2,883 deaths. In Kansas City, 11,431 cases of influenza and 1,724 deaths were reported.¹⁹ The actual numbers of influenza cases undoubtedly were much higher, as many cases were not reported. Both St. Louis and Kansas City had higher rates of excess mortality than other areas of Missouri. Despite these dreadful mortality figures, the two cities fared relatively well in comparison to many other large metropolitan areas. In St. Louis the mortality rate ranked 32nd highest among 49 U. S. cities with populations above 100,000 and was the lowest of the 10 largest cities in the country; Kansas City had the 17th highest mortality rate (Pittsburgh, Pa., ranked first; Grand Rapids, Mi., had the lowest mortality).¹⁷

What factors explain the widely variable death rates among American cities in the 1918 epidemic? In hindsight through the lens of 21st century epidemiologic analysis, insight is gained by assessment of several metrics: time from the first reported cases to the peak of the epidemic;

overall excess mortality compared to baseline; excess mortality at the peak; and weekly mortality curves over the duration of the epidemic. Figure 5 shows the epidemic curves of St. Louis and Kansas City in comparison to Boston, a typical hard-hit eastern city which had the fifth highest mortality in the country. Boston experienced one dominant early autumn wave with an early peak and exceedingly high excess mortality. The epidemic curves in the two Missouri cities, which were comparable, had important distinctions from Boston: later onset of the epidemic; longer time from onset to peak; much lower peak mortality; and two autumn/winter waves with highest mortality in the last wave. Several factors accounted for these differences.

Cities that implemented what are now known as social distancing interventions earlier had much lower peak mortality rates than those which delayed action.¹⁸ The flattened epidemic curves in St. Louis and Kansas City, as compared to Boston, indicate that control measures were effective and were implemented early enough to reduce mortality. In retrospect only a handful of the many “nonpharmaceutical interventions” used in 1918 worked: early closures of schools, churches, and theaters, and bans on public gatherings.¹⁹ Each of these measures were enforced in both Missouri cities. The duration of implementation of nonpharmaceutical interventions also had a salutary effect on mortality. Both Missouri cities maintained social distancing policies longer than many other cities. The net result was that in hindsight, both St. Louis and Kansas City, despite the latter’s political missteps, were among the four large U. S. cities, of 17 assessed, with the most effective interventions. In both cities disease transmission was 30–50% lower than expected.¹⁹ Modern policy makers have used these findings to refine public health approaches for contemporary pandemic influenza preparedness.^{17,18, 19}

Two other findings are notable. First, in both Missouri cities the higher second autumn/winter waves occurred after social distancing restrictions had been eased prematurely. Second, influenza mortality in Kansas City was consistently above that in St. Louis: from the onset of the epidemic in early October 1918 until its conclusion six months later, mortality rates were higher in Kansas City in 24 of 26 weeks.

In summary, from the vantage point of a century, we now recognize that social distancing actions taken by public health authorities in both St. Louis and Kansas City led to demonstrably reduced peak and

overall excess influenza mortality rates. However, in both cities, premature easing of school closures and other epidemic control measures resulted in higher mortality in the second autumn/winter waves. History has given high marks to public health and volunteer organizational responses to 1918 influenza for both of Missouri’s major cities, especially St. Louis, which benefitted from stronger leadership and a much less politicized public health approach than its sibling Kansas City.

Acknowledgments

The authors thank Dave Lowry; Kate Holdener; Mikall Venso, Jefferson Barracks Museum Curator; Gary Cox, University of Missouri Reference Archivist; Dr. Yates Trotter and Kitty Serling, MLS, for their assistance with this project.

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