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Comparative Study of Contagious Diseases in Clay County vs. Riley County: Diphtheria, Scarlet Fever, Smallpox, Typhoid Fever, 1907-1917

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A historical comparative study of the effects of disease on Clay County Kansas and Riley County Kansas between the years 1907-1917, to determine how having a University in the county seat affected the rates of diseases reported versus that of a mainly rural county.

Imagine standing on the edge of field, gazing out across the land, only seeing vast spreads of fields of farmland and prairie, but knowing a silent killer lurked just around the corner. The killer was disease, and this was the scene for many settlers that had staked claim in the counties of North-central Kansas at the beginning of the 20th Century. Unless located in an actual town, most families farmed and ranched and were separated from most contact with people. The children would attend school, but for the rest of the family at the time, most would only see the occasional neighbors or family members. This was true for most of the year except on the few days a month when a trip to town was made. With this sense of isolation came a great danger for most. This danger presented itself in the form of disease, whether mild or severe. Without immediate access to doctors, all diseases were considered dangerous. These circumstances are shown in Clay County, KS and Riley County, KS during the early 1900s counties are shown in appendix A.¹ Both counties are located in the North-central region of Kansas, and neighbor each other with Clay being directly west of Riley. Clay County produced a county seat in the town of Clay Center, located roughly in the center of the county; it was a suitable place that created a centralized hub for the county. After a short feud between Ogden and Manhattan, Riley County set its seat in the town of Manhattan.² As the counties grew, more people moved into the areas, and with this increase came the increase of infectious disease. Yet, even before the 1900's, people weren't oblivious to the threat of disease in the area, as an account about a diphtheria epidemic that swept the area in 1878 states, "children died terribly

¹ Homer E. Socolofsky and Huber Self, *Historical Atlas of Kansas, Second Edition* (Norman: University of Oklahoma Press, 1988).

² Winifred N. Slagg, *Riley County, Kansas: A Story of Early Settlements, Rich Valleys, Azure Skies and Sunflowers* (Brooklyn, NY: Theo. Gaus' Sons, 1968), 65, 77-79.

and suddenly.”³ Regardless of this, people were still coming to settle in the area in the early 1900’s. Yet, even with this settlement, these counties still remained fairly rural, and any illness was still a dangerous infliction. Though rural in parts, Riley had something that Clay did not; Riley had the Kansas State Agricultural College (now known as Kansas State University), that had set its roots in Manhattan in 1863.⁴ Diseases including diphtheria, scarlet fever, smallpox and typhoid fever still seemed to haunt the residents of both counties in for the early 1900’s; so, with ever-evolving threats of these diseases, how and what were the effects on affliction rates between Riley, having a university, and Clay, which was still in a rural niche?

Diseases

Diphtheria, aka the strangler, is an upper respiratory disease caused by the bacteria *Corynebacterium diphtheria*.⁵ The disease, which attacks the respiratory tract, can be very lethal if not treated. Diphtheria is characterized by a fever, sore throat, possible lesions, mucus formation, and in some cases the swelling of the neck which can block the airway causing suffocation, hence the nickname the strangler; and in some severe cases, the bacterium can cause an altered heart rhythm that can in some cases cause heart failure and death.⁶ The disease is transmitted via airborne molecules, but can also be transmitted via contact with infected, and can thus spread quickly through people, especially families that live in close contact. The disease more commonly affects those that have weaker immune systems, children and the elderly, but

³ Clara M. Blake, “The Babes in the Woods,” quoted in “Table Mound (a/k/a Diphtheria Cemetery),” in *Guide to Clay County Cemeteries*, 115. Available at Clay Center Historical Society, Clay Center, KS.

⁴ Slagg, *Riley County Kansas*, 65.

⁵ David C. Dugdale, “Diphtheria,” Medline Plus, last modified November 9, 2009, <http://www.nlm.nih.gov/medlineplus/ency/article/001608.htm>.

⁶ “Diphtheria,” last modified October 6, 2005, http://www.cdc.gov/ncidod/dbmd/diseaseinfo/diphtheria_t.htm.

can just as easily attack victims of any age. Mortality rates for those that go untreated can be 5% to 10%, and as high as 20% for children under 5 and people over 40 years old.⁷

Scarlet fever is a contagious disease that ran rampant Clay and Riley Counties during the second half of the 19th century and the beginning of the 20th. The disease which is caused by the organism *Streptococcus pyogenes* is characterized by causing a severe fever, sore throat, a swollen, red tongue, and a rash that causes peeling and drying of the skin with small red colorations. Some cases can lead to kidney infections, ear and nose complications, as well as swollen neck glands and diarrhea.⁸ Mortality rates for the early 1900's would have been 15-20% of those infected individuals.⁹

Smallpox a very contagious disease, is caused by the variola virus, and is spread via contact from an infected person, their mucus, or touching something that has been contaminated such as bedding, clothes, food, or drink.¹⁰ The initial symptoms are misleading and appear to be a slight fever, but after an incubation period, infected cells begin to die and release more of the virus into the system where it will attack the bloodstream, spleen, lymph nodes, and bone marrow. Muscle pain, nausea, backaches, coughing, and the typical lesions on the skin. Mortality rates for smallpox were around 30% for the regular kind, and almost 100% for the hemorrhagic species. The World Health Organization deemed smallpox eradicated worldwide in 1980.¹¹

⁷ Dugdale, "Diphtheria."

⁸ "Scarlet Fever," last modified April 13, 2008, http://www.cdc.gov/ncidod/dbmd/diseaseinfo/scarletfever_g.htm.

⁹ Edward J. Zabawski, "Scarlet Fever," eMedicine, accessed May 1, 2010, <http://emedicine.medscape.com/article/1053253-overview>.

¹⁰ "Smallpox," Center for Disease Control, accessed 2010, <http://www.bt.cdc.gov/agent/smallpox/>.

¹¹ "Smallpox," Center for Disease Control.

Typhoid fever is a direct result of the ingestion of the bacterium *Salmonella typhi*. The disease is passed via an infected persons stool. Once the bacterium is excreted, whatever it comes in contact with becomes a carrier, then is ingested via food or drink and is then passed to the next victim. Symptoms of the disease include diarrhea, fatigue, fever, muscle and joint pain, and headaches. Severe abdominal pains accompany the diarrhea, and can lead to vomiting. For the Riley County and Clay County between 1907 and 1917, antibiotics did not exist, and for untreated patients, mortality rates would have teetered around 20% and would have resulted from secondary infection, intestinal bleeding, and intestinal perforation.¹²

Clay County

Clay County in the early 1900's was a rural community whose main basis of income was agriculturally based. Family farms would have dotted the land, as well as small towns, most of which are lost today. The county seat, Clay Center, was the largest town in the county, and since it was located towards the center of the county would have been an oasis of goods and services to the surrounding areas. With Clay Center being a hub of commerce, it also would have been a hub for the spread of disease. Clay Center was located by a railroad line by 1878 which would have made it a hub of trade of goods and agricultural produce.¹³ However, according to a study, the railroad wasn't all good as it would have also been a harbinger of death. This is due to the fact that with the goods and commerce it brought, it would have also brought disease from more

¹² Ibid.

¹³ Socolofsky and Self, *Historical Atlas of Kansas*, 30.

densely populated areas, and thus local residents would have been systematically subjected to the

Table 1: Clay County Contagious Diseases from Clay County Contagious Disease Records SOURCE: Clay County Contagious Disease Records, courtesy Chapman Center for Rural Studies.

	Clay County			
-	Smallpox	Diphtheria	Scarlet Fever	Typhoid Fever
1907	4	14	0	10
1908	3	3	2	1
1909	0	2	2	0
1910	4	3	1	1
1911	10	1	9	1
1912	11	5	9	10
1913	8	0	3	2
1914	56	3	9	13
1915	82	3	18	6
1916	82	1	8	3
1917	13	1	7	3

threat of contracting diseases from the train system.¹⁴

Farmers, children, anyone using the railroad would have been in contact with disease, and would have carried it out away from populated areas back to the rural areas, thus having high probability of

spreading disease to neighbors and family. As shown in Table 1, these diseases had an effect on the county, and the numbers in some cases are startling.

As the table shows, disease was still a major factor, especially for families. The Knutson family made up 9 of the 10 people infected in the county with smallpox in 1911, and lost three children to the disease. Another striking blow to the entire county came by the way of smallpox epidemics. The first started in the town of Oakhill in 1914, which accounted for 34 of the 56 people that contracted the disease, and all that contracted it in Oakhill became ill between

¹⁴ Rodrick Wallace and Kristin McCarthy, "The Unstable Public Health Ecology of the New York Metropolitan Region: Implication for Accelerated National Spread of Emerging Infection," *Environment and Planning* Vol 39 (2007): 1183.

February and March. The next year, another series of epidemics hit the county, starting in Idana between January and March with 32 people contracting smallpox, and then in Clay Center starting in March and continuing through October with 20 people becoming sick. The last epidemic within these years happened in 1916. On February 20, 1916, in the town of Longford, an epidemic started. 52 people in the town were diagnosed with smallpox; when the epidemic ended in April, it seemed to move to the town of Morganville where 22 people became sick.¹⁵ No visible connection could be seen in the historical records observed, but with the number and closeness of these epidemics, it is probable that they were related. Whether connected or not, the epidemics must have been fairly well known, as during the same time period, Topeka was reported to have ordered restaurants in the area to “clean-up,” and then the State Board of Health ordered sanitation measures to be carried out including the spread of individual drinking cups, and individually wrapped loaves of bread to be ordered.¹⁶ This connection can be made with Topeka from the evidence of diagnosing physicians sending reports of smallpox cases to Topeka as observed in the records.¹⁷ These measures show that the epidemics in Clay County were taken seriously and that diseases could be seen spreading.

Riley County

In 1858, the Methodist Bluemont Central College was opened by early settlers in Riley County, which was eventually absorbed into the Kansas State Agricultural College in 1863. Further development began when in 1866 the Kansas Pacific Railroad laid its tracks into Manhattan.¹⁸ With the increasing population and the mass community of students and train

¹⁵ *Clay County Contagious Disease Records, 1907-1918*, Clay County Historical Society, via Chapman Center for Rural Studies, Kansas State University.

¹⁶ Kirke Michem, ed., *Annals of Kansas, 1886-1925, Vol. 2* (Topeka: Kansas State Historical Society, 1956).

¹⁷ *Clay County Contagious Disease Records, 1907-1918*.

¹⁸ Slagg, *Riley County Kansas*, 77-79.

traffic, disease was prevalent. Manhattan became a hub of commerce as well as disease, and the whole of Riley County

started to become infectious.

As one can see in

Table 2, the disease rates are

fairly high in some sections

and would have had a

significant impact on the

general public. In 1909, 56

people in Riley County

contracted smallpox, a fairly

high number. But it's even

more astonishing that 31

were from Manhattan alone,

and were between the ages

of sixteen and twenty-four,

the perfect age for students,

including college age for

some. Families were also

affected in Riley as they were in Clay County. In 1911, an epidemic of scarlet fever plagued the

county, afflicting 103 people; the Mies family alone had ten people fall ill. Again in 1917, a mild

epidemic of typhoid fever was recorded, which totaled 38 people, 22 of which were college-aged

Table 2: Riley County Contagious Diseases, from Riley County Contagious Disease Records. SOURCE: Riley County Contagious Disease Records, Riley County Clerk's Office, and Riley County Historical Society.

Riley County				
-	Smallpox	Diphtheria	Scarlet Fever	Typhoid Fever
1907	0	0	0	0
1908	1	2	5	0
1909	56	39	10	11
1910	3	4	9	14
1911	11	2	103	11
1912	1	0	38	10
1913	3	3	7	8
1914	0	10	9	7
1915	20	18	8	8
1916	3	4	47	11
1917	18	21	51	38

young adults.¹⁹ These records help to show that having a large group of students gathered was a very possible means for many to become ill due to close contact. As in Table 1, Table 2 doesn't specify gender due to incomplete records, and for the fact that the college has a biased number of males compared to females at this time.

Factors

By studying the data from both counties, we can see clear comparisons, and clear differences. Both counties had surprising numbers in some cases, especially Clay County with the smallpox epidemics. It seems that both counties had little reporting toward the beginning of the century; as disease was present, it was most likely just not recorded well, or the ill weren't even diagnosed by a doctor. Clay Center didn't have a hospital until 1925, so the doctors would have been traveling doctors with the closest hospital being in Manhattan or in Junction City at the Geary County Hospital which still wasn't built until 1913 (Geary County is the bordering county immediately south of Clay).²⁰ Most doctors spent time traveling to nearby farms or towns. This mode of examinations was common, thus making it difficult for some to even see a doctor if they came down ill.

These diseases spread fast and killed fast; as one account shows, even seeing a doctor in some cases wouldn't help. In 1918, a woman by the name of Lida White McCully came down with influenza. Shown with Husband Charlie in Appendix B, she was young and full of life. Upon being diagnosed with influenza, she was quarantined with her two sisters who had also been diagnosed. During the same night, she died in the same bed with her sisters. Lida died

¹⁹ *Riley County Contagious Disease Records, 1909-1920*. Courtesy Riley County Clerk's Office via Riley County Historical Society, Manhattan, KS.

²⁰ Michael Proffer and Veronika Novoselova, "Keeping Well: Country Doctors in Broughton, 1900-1930," in *Broughton, Kansas: Portrait of a Lost Town 1869-1966*, M.J. Morgan and students of Kansas State University, 95-98. (Manhattan, KS: The Chapman Center for Rural Studies at Kansas State University, 2010), 95.

leaving a three-month-old child and her husband behind.²¹ As shown by the numbers in both tables, disease was rampant, and if the smallpox epidemics are removed from both tables, it is clear that Riley County had a significantly higher rate of reported infection than did Clay County.²² Does this mean that more people were afflicted with illness in Riley than in Clay? The answer cannot be certainly justified either way. Yet, it is easy to see the possibility that with the university, many people would have gathered on a daily basis to attend class, creating the perfect environment for disease to be transmitted. This possibility can be shown with the higher numbers of reported cases, and interpretations can be made to show that Clay didn't have as high of numbers due to the rural aspect of the county. People did gather at the university, so this would have given more people the opportunity to see a doctor and report illness, compared to Clay, where due to the rural nature, it can be understood that some cases were probably not reported. Either way, it is clear from the records that between 1907 and 1917, that almost everyone from Clay County and Riley County would have been affected by disease, whether directly, or interpersonally; and the effect these diseases had is something that should never be forgotten.

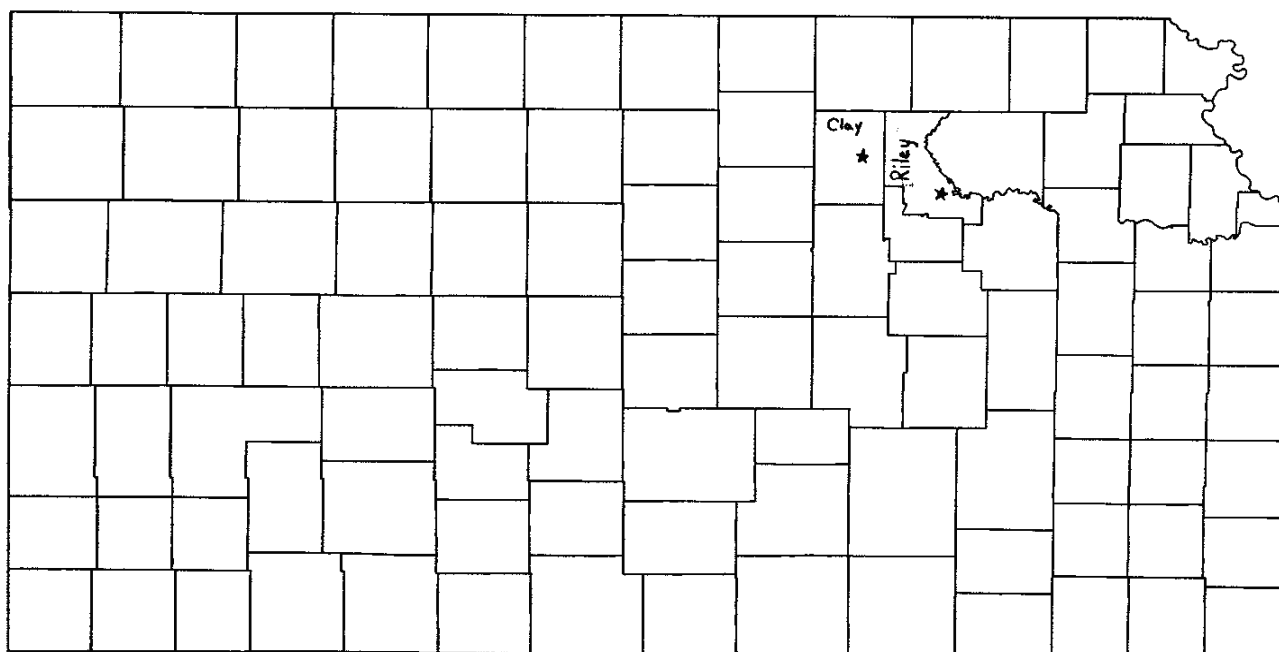
²¹ Cathy Haney, Oral Interview, Clay County Museum and Historical Society, 2007.

²² *Clay County Contagious Disease Records, 1907-1918*. Also see: *Riley County Contagious Disease Records 1895-1908 and 1909-1920*.

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<http://emedicine.medscape.com/article/1053253-overview>.



Appendix A: Map of Kansas Counties Note: Clay and Riley counties in North Central section, stars designate county seat. SOURCE: Author.



Appendix B: Charlie and Lida White McCully circa 1918, Broughton, Clay County, Kansas. SOURCE: Clay County Museum and Historical Society.