CHOLERA IN ROCHESTER: THE ANATOMY OF AN EPIDEMIC

AKSHAYA

SFX CUE 01 IN: Birdsong, happy & bright

In the quaint town of Rochester in 1832, laughter echoed through a stone building standing beside a gentle, flowing waterbed. Up on the second floor resided the Rall family - a father, a mother, and their three lively boys. The children would spend their days out in the sun, playing hide-and-seek, while their father worked as a skilled mechanic. Despite their modest means, the Ralls were happy. However, all this bliss would be shattered on a fateful September day.

SFX Cue 01 OUT:
MUSIC 01 FADE IN: fateful, somber music, sad

On the night of September 15th, Mrs. Rall falls to the ground convulsing. Tragically, by the following day, she was pronounced dead. Three days later, little John, her 4 year old son, would perish from the same disease his mother passed to him. That same night, 8 year old Irving would die as well. By 5 pm the next day, 14-year-old Walter would pass away from the same relentless disease.

Welcome to Hear UR. This is episode two: Anatomy of an Epidemic. I'm your narrator, Akshaya. Cholera, or "Genny Fever" as it was known to the region at this time, was a devastating epidemic that ravaged Rochester in the 19th Century. In examining the epidemic's history, we look at Rochester's response to the rapid spread of cholera through its mire-laden streets. We look at broad questions about how disease and public health operated in an area before germ theory. Finally, we examine the prevalence of cholera today.

MUSIC 01 FADE OUT
MUSIC 02 FADE IN: intro music

AKSHAYA

As with any infectious disease, mitigating the menace of cholera requires a wide array of interventions, ranging from medical innovations, government action, and far-reaching changes to cultural norms. In short, the study of cholera and its history revealed not just the disease's biological reality, but the strain and adaptation this disease forced on the social fabric of nineteenth century Rochester.

MUSIC 02 FADE OUT
MUSIC 03 FADE IN

AKSHAYA

In 1817,the first recorded cases of cholera were found in West Bengal, a

pivotal hub of economic and trade activity in Northeastern India. The region served as a nexus for trade routes, extending to Southeast Asia, the Middle East, and Europe.

SFX CUE 02 IN: Steamboat Horn

AKSHAYA

By 1832, immigration ships from Europe introduced the disease to Quebec and Montreal, where the epidemic escalated. The contagion rapidly spread to other areas including New York City and New Orleans.

The arrival of cholera in North America caused apprehension, so much so that the epidemic led to the revival of the Board of Health in Rochester. Fearing the worst, Rochester revived its Board of Health.

SFX CUE 02 OUT

AKSHAYA

In June of 1832, the president of Rochester’s Board of Health sent Dr. Anson Colman, the best doctor in the city, to observe the conditions in Montreal and report back.

COLMAN (VOICE ACTOR):

Dear Sir,
I have seen about forty six cases in the whole, thirty five of which since I

arrived in Montreal. One thing only I have time to say & that you must diminish as far as possible the terrifick [sic] apprehension of it [sic] contagiousness-- I have been in every [sic] situation where if the disease *had* been communicable I should have received it, but have remained perfectly free from the disease The *Atmosphere* in this City is in a state extremely unfavorable to *full* health my own sensations fully attest, yet if I should be able to get off in a few days I shall I think escape the Cholera.

AKSHAYA

The people of Rochester did not fully understand what was happening. Medical science had not yet progressed to the point where people understood disease as caused by microbial agents. Some in Rochester understood cholera as divine in nature, a punishment from God. The faithful of Rochester proposed a “Day of Humiliation”, a citywide day of enforced prayer to head off the disease before it came to the city. The Board of Health rejected this proposal.

Music 03 Fade Out

To better understand these pre-germ theory notions of disease, we spoke to Dr. Emeritus Ted Brown, Professor at the Department of Public Health Sciences at the University of Rochester, about early ideas of medicine and public health, and their influence on how people were able to

respond to infectious disease outbreaks.

PROF. BROWN

So the Hippocratic corpus that’s most famous for articulating this is called Airs, Waters, and Places, and the most striking example that the Hippocratic corpus lays out is of what’s called Tertian Intermittent Fever. Produced in areas which are endemically marshy and brackish- the waters are brackish, the surroundings are marshy- Tertian Intermittent Fever, which means a fever that spikes every third day, is identifiable in modern terms as malaria. So what the Hippocratics were able to put together was a very clever correlation between a particular environment, these marshy, very swampy areas, and the occurrence of a particular kind of disease which they attributed to the particular environment. They had no notion of [the] mosquito, no notion of vector transmission, and yet that firm connection between a particular kind of climate environment, and a particular pattern of disease, was fixed in the medical imagination from that point forward.

DR. DZIEJMAN

In past times and certainly in current times, Cholera really thrives in conditions where there's a lack of sanitation so it's often thought of as a disease of poverty.

AKSHAYA

This is Dr. Michelle Dziejman, an expert microbiologist who runs a cholera-focused laboratory at the University of Rochester Medical Center.

DR. DZIEJMAN

Rural areas or developing countries that don’t have an infrastructure for sanitation or under circumstances where there’s overcrowding and refugee situations and lots of people in one place all using one source of water for everything…is a perfect breeding ground for Cholera.

MUSIC 04 FADE IN

AKSHAYA

Strolling through the streets of Rochester in the 1830s, one is met with a mosaic of mud puddles, their murky depths mirroring the city's neglected corners. The thoroughfares of Rochester were marred by dirty, muddy streets, earning the city the unflattering moniker of the "mud city" (Almanac 1854).

AKSHAYA

Victims of cholera often find themselves besieged by violent outbursts of vomiting and profuse diarrhea. Once-vibrant skin takes on a pale hue and cramps wrack their abdomen

mercilessly. Dehydration sets in swiftly, draining victims of their strength. The body becomes a battleground, and every symptom is a testament to the ferocity of the fight for survival. Amidst the silent chaos, the relentless grip of the illness claimed souls with an unforgiving grasp.

AKSHAYA

Aside from age and immunity, what are other factors that would make someone more susceptible to Cholera? Here again is Dr. Dziejman.

DR. DZIEJMAN

Certainly people who work on waterways or have jobs that bring them into contact with contaminated water are more at risk than for example a small home in a village that's not near any sort of water or river or estuary.

AKSHAYA

A review of Rochester's Cholera epidemic written by John Putnam in 1849 surmised, *"of all the permanent causes of disease existing in this city, no one has probably proved more destructive to life and health than our imperfect and defective system of sewerage".*

Music 04 FADE OUT

Neighborhoods near the river, the muddiest and poorest parts of the city,

were hit the hardest by cholera. Cases clustered not only along waterways, but in streets that later Health Department reports characterized as having poor quality sewers and drainage systems.

DR. DZIEJMAN

In the 1800s, we didn't really have a good understanding of the idea that bacteria or viruses could cause disease so the idea of germ theory wasn't developed until the late 1800s. And so now, of course,we know that the disease is caused by a bacterium called Vibrio cholerae, and the bacteria lives just naturally in aquatic reservoirs worldwide, and it lives perfectly happily on its own but when it's ingested by people, strains that are pathogenic can then colonize the small intestine and go on to cause disease. So the oral-fecal method of transmission is exactly what it sounds like, right, contaminated water that has been the repository for individuals infected with cholera…So when water sources are contaminated with the output from infection and then individuals are ingesting that contaminated water, that is how you have an oral fecal route of transmission.

MUSIC 05 FADE IN

AKSHAYA

In looking at maps of Rochester's 1854 cholera epidemic, there are clear

instances of clustering of cases around specific neighborhoods. What caused those clusters to happen?

DR. DZIEJMAN

I think probably the very same thing that Jon Snow found.

AKSHAYA

Jon Snow was a British physician, known as the father of epidemiology.

DR. DZIEJMAN

Incidents of disease and the mortality that was associated with it were closest to the water sources that were contaminated. And if those water sources could be cleaned up or eliminated or if people could be encouraged to not use those water sources, for example to even wash their hands if they had been in contact with those water sources, those are the kinds of things that could have probably helped at that time but that’s probably the reason for some of the clustering that was seen in Rochester at that time.

AKSHAYA

Doctors at the time were also suspicious of water and local environments as causes of the disease. Because of their observations, they

were able to conclude that person-to-person transmission was not a primary cause of cholera.

DR. DZIEJMAN

…as we've learned more about the epidemiology of the disease and as investigators have spent a lot of time in the field in endemic and epidemic areas, what we've learned is that there is a certain percentage of transmission that does occur person to person and that's in a close situation in households where people are living and eating and bathing and working together…So that person to person transmission turns out to be an element involved in cholera transmission but by and large the ingestion of contaminated water is responsible for really I think the majority of disease.

AKSHAYA

Rochesterians were so assured of the non-transmissibility of cholera through personal contact that leading doctors assured the infected to quote: "go about his ordinary affairs, fearlessly, industriously, prudently, avoiding no situation".

MUSIC 05 FADE OUT

Although it may be tempting to imagine the people of the 1800s as

scientifically illiterate, many of these measures reflect substantial efforts to address what 19th century Rochesterians viewed as causative of cholera.

Here, again, is Dr. Brown:

PROF. BROWN

One of my major themes, a sufficient basis of what I would call public health intervention. You don't have to have deep knowledge, you don't have to have laboratory based knowledge, you can have very well generalized knowledge based on a simpler level of experience such as transmission of disease by contagion, transmission of disease from a distant place by people who have it and are obviously sick but if they get loose in the population and will transmit it, particular environments would just smell, and look, be terribly unhealthy. You could, if you had the will, and the political gumption and authority you could intervene to try to prevent diseases from spreading without knowing the particular mechanism at the molecular level or even the microscopic level, you just have enough. And this is what I would call the basis of good, practical epidemiology, you have sufficient knowledge based on generalization from numbers of people that could lead to a course of action if you had the political will to act on it.

MUSIC 06 FADE IN

AKSHAYA

Public health officials in Rochester made substantial efforts to mitigate cholera based on the knowledge available at the time.

As the Rochester Board of Health gained experience with cholera, their recommendations and policies became more and more sophisticated. Because it was known that the poorest residents were most vulnerable to cholera, local governments began to evacuate almshouses once cholera was detected in them, and provided money for the evacuees.

Even with the mitigating policies of the Board of Health, the mass death and devastation caused by cholera left an indelible impact on the landscape of Rochester. In 1838, six years after the first cholera epidemic, Rochester established the Mount Hope Cemetery, partially out of a need for a place to dispose of diseased bodies away from the populated areas of the city.

Today, areas at-risk for cholera are limited to peri-urban slums, refugee camps, and regions affected by humanitarian crises.

Our progress in eliminating Cholera stands to prove that knowledge is power.

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MUSIC 07 FADE OUT

AKSHAYA

HearUR is a podcast created by students at The University of Rochester. This episode was produced by Akshaya Ganesan. Our lead researcher was Jonah Stapels. Our engineer was Finnian Smith. The Music used on this episode was from Blue Dot Sessions. We'd also like to thank Dr. Michelle Dziejman and prof. Ted Brown for their interviews.

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