

PALE HORSE, PALE RIDER

The 1918 Influenza
Epidemic in Waltham



Behold, a pale horse,
and its rider's name was Death

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This lecture takes its name from the autobiographical short novel, *Pale Horse, Pale Rider*, written by Katherine Ann Porter. In the story, a young reporter in 1918 becomes sick with influenza, and is tended to by her fiancé, a young soldier. When she emerges from her delirium, she discovers that her fiancé has died of the flu. Porter took her title from Bible Book of Revelation or the Apocalypse "...behold, a pale horse, and its rider's name was Death."

MARY ELLEN (STEELE) KELLY
1880 - 1918



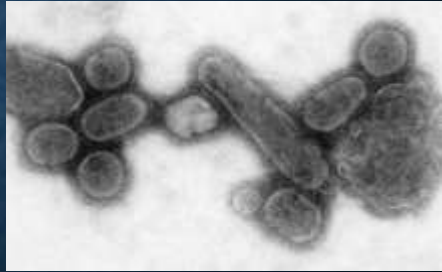
Every year the Carnegie Hero Foundation awards people who risked their lives to save others. In 1918, there were many everyday heroes – nurses, doctors, religious order sisters, family members and neighbors – who bravely cared for thousands of sick and dying patients in one of the worst epidemics in human history. This lecture is dedicated to my grandmother, Mary Ellen Kelly, who volunteered to care for a dying neighbor, even though she knew the risks involved. Three days later, she died of influenza at the age of 38 years, leaving a husband and two daughters. She is our family hero.

Influenza virus in 1918

The influenza virus of 1918 is one of the most studied pathogens in modern history. The virus infected 500 million people world-wide, one-third of the world's population, and killed some 50 million people. In Waltham, the virus infected 4,300 people, more than 13% of the population, and killed 278 people. This was 5 times the number of Waltham soldiers and sailors killed in WWI. In this presentation, we will examine the flu epidemic in Waltham and how the city dealt with this medical disaster.

INFLUENZA VIRUSES

- 3 strains: A, B, & C
 - Type A most severe & can infect humans, birds, pigs, seals & whales
- Type A subtypes divided by surface proteins, hemagglutinin (HA) & neuraminidase (NA)
- 16 variations of HA & 9 of NA
- H1N1, H1N2, & H1N3 infect humans
- H5N1 infects birds



Recreated 1918 Influenza Virus

A virus is a microscopic organism that can replicate only inside the cells of a host organism. There are three strains of influenza virus: types A, B, and C. Type A is the most severe and can infect humans, birds, pigs, seals, whales, and even horses and dogs. Type A is further subdivided by the surface proteins, consisting of hemagglutinin (HA) & neuraminidase (NA). There are 16 variations of HA and 9 of NA. So influenza viruses are called, for instance H1N1. H1N1, H1N2, and H1N3 infect humans, and H5N1 infects birds. H3N8 infects dogs.

TRANSMISSION OF AVIAN VIRUSES



Most viruses that begin in bird populations are transmitted to pigs, whose anatomical and physiological traits are similar to humans. Sometimes when a pig has influenza and catches a bird or avian virus, the viruses recombine to form a new virus. Pigs and humans can readily exchange flu infections. But sometimes a bird flu virus is transmitted directly to humans. If the human already has the flu, the bird virus can recombine with the human virus to form an organism that can be spread from one human to another. The avian virus, H5N1 can infect humans, and its case mortality rate is 60%, but it cannot be transmitted easily among humans. Since influenza viruses constantly undergo genetic changes, scientists are concerned that the H5N1 virus could mutate to a more transmissible form, while retaining its high mortality rate. Small farms where poultry and swine are raised in close proximity are often breeding places for new influenza viruses.

1918 INFLUENZA VIRUS

- H1N1 virus recombinant with avian virus
- HA & PB1 genes caused increased virulence & transmissibility
- Autopsies showed severe lung damage, acute bronchitis & alveolitis, massive pulmonary edema, hemorrhage & rapid destruction of respiratory epithelium, severe bacterial pneumonia




The 1918 influenza virus was an H1N1 virus that recombined with an avian virus. Studies genetically replicating the 1918 flu virus have shown that its HA and PB1 genes caused increased virulence and high growth rate. Autopsies of 1918 flu victims have also shown the presence of bacterial pneumonia, severe lung damage and massive pulmonary edema. There were three waves of influenza in 1918. The first wave occurred in the Spring, and its mortality rate was similar to a seasonal influenza. The DNA from this wave show more avian characteristics. But the virus had mutated in the second wave in the Fall, and was much more virulent and transmissible than the earlier version. A third “rebound” wave arrived in December 1918, perhaps due to the lifting of quarantine measures, and this was a milder outbreak.

ORIGIN OF 1918 FLU VIRUS

Origin in World

- ? Fort Riley, Kansas
- ? Asia
- ? British Army hospital in France
- ? Unknown

Landfall in America

- Commonwealth Pier, Boston
 - Chelsea Naval Hospital
 - Mount Auburn Hospital
 - Cambridge & Boston
 - Other towns
- 

Exactly where the 1918 flu virus originated is still a question of debate. Some claim it began in Asia, while others say it first showed up in British army hospitals during WWI. Many scientists support the conclusion that the virus first showed up at Camp Funston, a major training camp near Fort Riley, Kansas, perhaps transmitted from migrating waterfowl. Soldiers were sent to Europe from there in the spring of 1918.

ORIGIN OF 1918 FLU VIRUS



Landfall in America

- Commonwealth Pier, Boston
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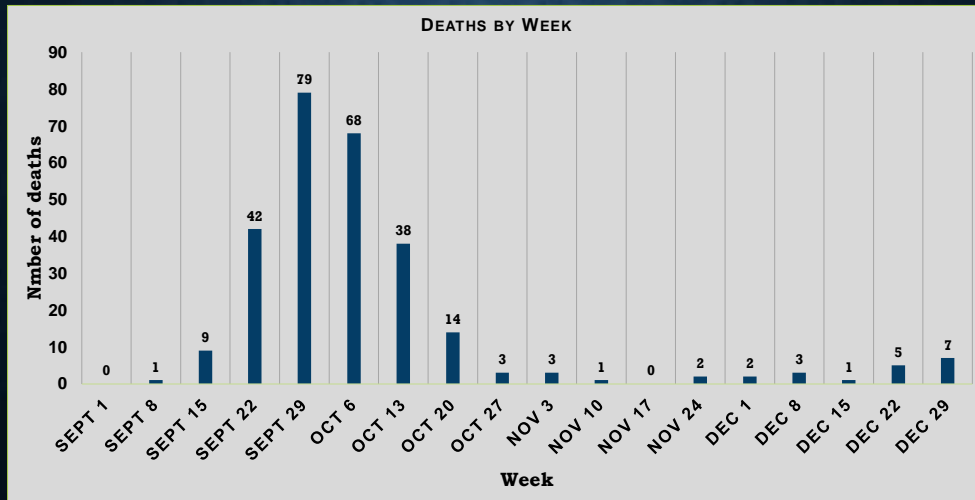
Here we see a large infirmary at Camp Funston with soldiers sick from the flu. Soldiers from Camp Funston were sent overseas to Europe to fight in the war. The Spring virus had more avian characteristics that made it milder and less easily transmitted.

Over the summer, the virus developed more human viral characteristics that made it more lethal and more easily transmitted. As the war wound down, returning soldiers from the battlefields of Europe brought the more lethal version back to America. This second wave made landfall in America at Commonwealth Pier in Boston, which was a naval transfer station for returning sailors. On August 27, two Navy seamen reported to sick bay with the flu, and on the next day, there were eight more, and on the third day, there were 58. The sick sailors were sent to Chelsea Naval Hospital, which quickly filled up with flu patients. The Navy had a radio school at Harvard College, and they used their Harvard contacts to approach Mount Auburn Hospital, asking if the Navy could take over two of the four wards at Mount Auburn for sick sailors. Mount Auburn agreed, and a week later, nine nurses were reported sick with the flu. The influenza virus spread quickly into Cambridge and Boston, and these cities were greatly impacted by the deadly epidemic.

Influenza data for Waltham

I created a database of deaths from influenza in Waltham from September through December 1918, and analyzed the data by time period, place of death and age of the victims.

FLU DEATHS IN WALTHAM SEPT – DEC 1918



Waltham officials watched warily as newspapers reported the approaching calamity, but remained complacent, since they had not seen cases in Waltham yet. But things changed very quickly, when the first case was reported on September 9 at Waltham Hospital. Here is a graph showing the numbers of death from September through December, and as you can see in three weeks, the number of deaths spiked to 79 per week. While the number of cases was high, the span of time was relatively short, and the epidemic was abated significantly by the end of October. When the public quarantine measures were lifted at the end of October, there was a smaller rebound epidemic in December. We see that the number of deaths in the week of September 29 was the highest, and yet Waltham did not make it a reportable disease until October 4. So there are only estimates for the number of people ill with the flu before October 4.

TIMELINE

September 1918						
S	M	T	W	Th	F	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

- Sept 10 – 2 cases reported in Waltham
- Sept 12 – 1st death in Waltham
- Sept 17 – Hundreds of cases reported
19 cases in Waltham Hospital
- Sept 19 – 17 nurses at WTSN sick;
6,000 sick at Camp Devens
- Sept 20 – Waltham Hospital filled with
flu cases; desperate need for nurses
- Sept 23 – 60 cases of flu at Waltham
Hospital; dozen deaths
- Sept 25 – 1st death at Fernald

The first official case in Waltham was reported on September 9, and another case the following day. By September 12, the first person, Catherine (Fitzpatrick) Kelly, died at Waltham Hospital. She had contracted the flu on September 7, and was hospitalized two days later. She was the 28-year old wife of Daniel Kelly, a supervisor at the Francis Cabot Lowell Mill, and the couple lived at 220 Moody Street. They were expecting their first child, and she was 6 ½ months pregnant at the time of her death. Pregnant women were considered especially vulnerable during the epidemic.

In one week, there were reports of hundreds of flu cases, and 19 people had been hospitalized at Waltham Hospital. By September 19, there were 17 nurses sick with the flu at the Waltham Training School for Nurses. By the next day, Waltham Hospital was filled with flu cases, and was reporting a desperate shortage of nurses. The war took away, not only the young men as soldiers and sailors, but also doctors and nurses. Dr. Alfred Worcester was in Italy running a hospital for Italian prisoners. Many nurses, both student and graduates, from the Training School for Nurses had volunteered to work for the Red Cross in Europe, and some later reported their experiences at front-line hospitals. So there was already a dangerous shortage of medical personnel, not only at Waltham, but also the Massachusetts School for Feeble-Minded, later called the Fernald School. The first death due to influenza occurred at the Fernald School a little later – on September 25. But, as we shall see, the institution suffered badly after that date.

September 26

- Flag raising at City Hall cancelled
- Drills at Armory suspended
- Movie theaters & dance halls closed
- Waltham Hospital refuses to admit more patients
 - Not a bed shortage
 - Due to nursing shortage
- 2/3 of school children absent from school
- Schools suspended
- Immigrant population severely affected

September 28

- Weston calls for help
- Churches ordered closed
- Public funerals prohibited
- City requests state aid:
 - 1 physician
 - 8 nurses
 - 35 beds
- City divided into districts to provide systematic care for all patients
- Public Health nurses caring for >140 patients per day

By Thursday, September 26, the city health department started trying to stem the epidemic. A flag-raising at City Hall was cancelled; military drills at the armory were called off; and movie theaters and dance halls were closed. Although the city had not shut the schools on earlier days, 2/3 of the parents responded by keeping their children home. Dr. Fuller, head of the city's health department, had reasoned that the children would be better off in the schools, where they could be supervised and monitored for illness. (Later, the role of school children as vectors for contagious disease has been recognized.) The schools were finally closed on September 26. The impact of the epidemic was not spread out evenly. Dr. Fuller reported that 4/5 of the immigrant Italian population was severely affected. This occurred in other cities as well. The new immigrants were crowded into poor, densely populated housing conditions, and many suffered from tuberculosis, making them especially vulnerable.

By September 28, the flu had impacted other communities as well, towns that were serviced by doctors from Waltham Hospital. Weston called for help. In Waltham, churches were closed, and public funerals banned. The city appealed to the state for help in the form of a tent hospital, saying that 1 doctor, 8 nurses and 35 beds were needed. The distribution of health care was centralized, and the city was divided into districts, to provide systematic care for homebound patients. School nurses and district nurses were transferred to the department of health, and by September 28, the visiting nurses were seeing 140 patients per day.

October 4 - 5

- 9 men from Street & Water Depts. to dig graves at Calvary Cemetery
- Visiting nurses see 164 patients; aided by ND sisters & Sister of Charity
- WTSN & Red Cross distribute food, clothing, bed linens to homes
- Call for automobiles; C of C responds; 45 automobiles in use
- Relief HQ transferred from City Hall to Waltham Training School for Nursing

Oct 7 - 10

- Soda fountains, bowling alleys, pool halls, library closed
- Peak occurred on Oct 7, when 37 visiting nurses & volunteers saw 203 home patients
- Mills kept open since they are essential to war
- Tent hospital (Camp Jensen) opened on Oct 9
- Flu raging at Mass. School for Feeble-minded
 - 286 cases, 20 deaths so far

On October 4, influenza was made a reportable contagious disease by the state. So the city began collecting data on patients with the flu on that date. As a result, data on who had the flu, where they lived, etc. was not collected by the city during the peak period in September. The epidemic resulted in 278 deaths in the city, many of whom were buried in Mount Feake or Calvary Cemetery. Bodies were piling up in morgues, since the cemeteries did not have enough grave diggers to handle the volume. One of our historical society members said her father remembered seeing stacks of coffins at Calvary Cemetery during the epidemic. The city ordered 9 men from the water department to dig graves at Calvary Cemetery. Mount Feake Cemetery was also sorely pressed, but since a lot of the victims were residents of primarily Catholic neighborhoods in Waltham, Calvary was greatly challenged in keeping up with burials.

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Volunteers in the form of nursing assistants came to the aid of the visiting public health nurses. According to the nurses, the most effective volunteers were the Sisters of Charity at St. Charles, and the Notre Dame Sisters from St. Mary's and their novitiate on Newton Street. They said that the Sisters of Charity knew just what to do, and were not afraid to do it. These volunteers enabled the nurses to increase their visits to 164 patients per day. Because in many cases, entire families, including both parents, were prostrate with illness, the Waltham Training School for Nurses via the Red Cross was distributing food, clothing, and bed linens to homes. The Notre Dame Sisters provided six gallons of broth and soup per day. The Red Cross appealed for people to lend their automobiles so that the visiting nurses could quickly get to their patients, and the Chamber of Commerce supplied some cars. The relief headquarters were transferred from City Hall to the Waltham Training School for Nurses.

By October 7, pool halls, bowling alleys, soda fountains and the library were closed. The library did keep its circulation department open; since so many people were homebound, there was a great demand for books. The peak in cases occurred on October 7, when 37 visiting nurses and volunteers saw 203 home patients in one day. The largest employers, the Francis Cabot Lowell mill, the Bleachery, and the Waltham Watch Company stayed open throughout the epidemic, with the reasoning that they were needed for the war effort. The state guard erected a tent hospital on October 9. The number of flu case rose exponentially at the Fernald, which reported hundreds of cases and 20 deaths.

October 11 – 14

- 6 patients admitted to Camp Jensen tent hospital
- Waltham Hospital doctors not sending any patients
- Camp Jensen can accommodate 68 patients
- Drs. Richard Collins, Dwight O'Hara & C. B. Fuller assigned to tent hospital

Oct 15 – 19

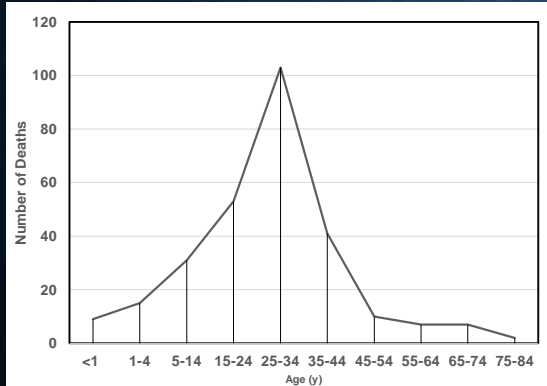
- 39 flu patients at Waltham Hospital
 - 16 are nurses or attendants
- 26 patients at Camp Jensen
- Red Cross is severely taxed
 - 132 families on wait list for food
- Notre Dame sisters at novitiate make 3 gallons of broth & 3 gallons of soup/day
- Camp Jensen closed on Oct 19

The state guard set up a military hospital on the grounds of the Robert Treat Paine estate off Stanley Road, and named the 68-bed hospital, Camp Jensen, after WWI Waltham hero, Sergeant Walter Thomas Jensen, who had died of wounds in August. Dr. Charles Benjamin Fuller, Harvard medical student Dwight O'Hara, and Dr. Richard Collins were put in charge of the hospital. 6 patients were admitted on October 11. The intent was to transfer all flu patients to Camp Jensen, and thereby free up Waltham Hospital to treat patients with other ailments. But Waltham Hospital doctors refused to transfer their patients to Camp Jensen, and I will explain more about this later.

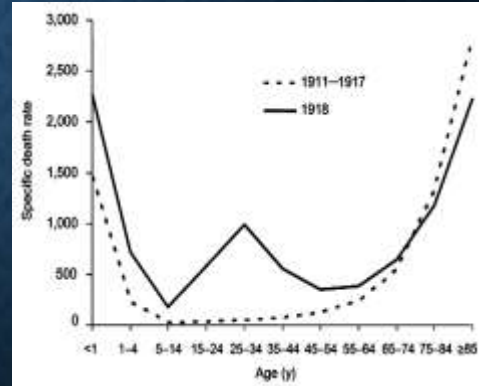
The number of new flu patients started to drop off by October 15. By this time, there were 39 flu patients at Waltham Hospital, many were nurses. Camp Jensen had 26 patients. The Red Cross was severely stressed, with 132 families on a wait-list for food. Because the number of patients had declined precipitously, Camp Jensen was closed on October 19.

DEATHS BY AGE GROUP

Waltham

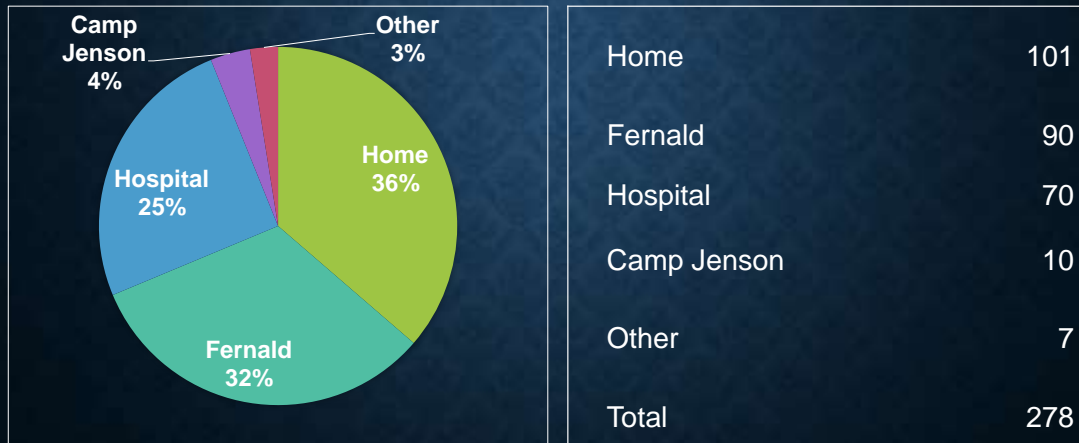


U.S. Population



The second wave of flu in 1918 that occurred in September and October had an unusual distribution of mortality by age. Looking at the graph on the right, at the dashed line, you can see that the age distribution of previous years is u-shaped. Flu deaths occurred most frequently among the very young and the very old. But in 1918, the distribution was unusually different, with a peak occurring in the 25-to-34 age group, that is, young, working adults. The age distribution of flu deaths in Waltham was similar to the national data. Mortality among older people was comparatively low, leading many researchers now to conclude that they had some measure of immunity, due to a previous epidemic.

FLU DEATHS IN WALTHAM SEPT – DEC 1918



Next, I looked at where in Waltham people died, and found the greatest number died at home, most likely because they could not get into the hospital. That being said, there really was no very effective treatment, since antibiotics had not been developed yet. There were 90 deaths at the Massachusetts School for the Feeble Minded, later known as the Fernald School. 70 deaths occurred at Waltham Hospital and 10 at Camp Jensen. The Other category includes people who died in relatives' homes, or in a couple of cases, a private hospital on Adams Street. The fact that 36% of people died at home underscores the important need for visiting or district nurses in caring for the sick.

FLU STATISTICS

	National	Waltham total	Waltham residents	Fernald	Fernald North Building
Population	103,268,000	32,000	32,000	1,566	121
# flu cases	28,915,040	4,300	3,467	833*	121
% of population	28%	13%	10%	50%	100%
# deaths	675,000	278	168	87**	30
Mortality rate= deaths per 1,000	6.5	8.7	5.5	54.0	248.0
Case mortality= deaths/cases	>2.5%	6.5%	4.8%	11%	25%

* Includes 55 staff

**Includes 2 nurses

Some of the people who died at Waltham Hospital came from adjacent towns, such as Waverley and Weston. Also, there were a large number of deaths at the Fernald School. So I separated the data to analyze mortality among Waltham residents and among Fernald residents. Waltham had a population estimated by the city at 32,000. This would make Waltham about the size of Lexington now. The health department annual report showed that there were 4,300 flu cases in the city. This was a conservative estimate, because the flu was not reportable until October 4. We saw that the greatest number of deaths occurred in the week before, so the number of flu cases is probably underestimated. We see, in fact, that national data shows 28% of the country was infected with the flu virus, and yet Waltham showed less than half of that. The national mortality rate for the flu was 6.5 deaths per thousand, and the mortality rate among Waltham residents was 5.5 per thousand. So the mortality rate in Waltham was similar to the rest of the country. But the case mortality rate was almost double the national rate. Case mortality shows the percentage of deaths among people who contracted the flu. For Waltham, the case mortality rate was nearly 5%. This is probably a reflection of the underestimate in the number of flu cases in the city. If more people actually contracted the flu, the case mortality rate would be lower.

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I also looked at the street addresses and neighborhoods where people died. Very few people on the north side of the city died, and this is probably due to the lower density of population, at a time when most of the north side was farm country. More people from densely populated, poor neighborhoods, such as the Chemistry district, River Street, and the School Street area, died.

The mortality rate at the Fernald School was shocking. The fiscal year for the Fernald ended on November 30, so I used the data from the school's annual report. On September 1, the school had 1,566 residents. By the end of November, 778 residents and 55 staff members had come down with the flu. That was an infection rate of 50% among the residents. 85 residents and 2 nurses died. So the mortality rate was 54 per thousand, or 8 times the national average. And whereas, the national case mortality rate was a little over 2.5%, at the Fernald, the rate was 11%. The worst situation occurred in the North Building, where 30 of the 121 residents died. The North Building was home to adult males who were more disabled than others in the institution, and therefore more vulnerable.

INFLUENZA AT FERNALD

- Inmate population = 1,566 on Sept. 1
- Number of inmate flu cases = 778 (50%)
- Inmate deaths = 85* by Dec. 1
- Fernald flu mortality = 54 per thousand
- Case mortality rate = 11%
- North Bldg, 30 out of 121 (25%) inmates died; 248/1,000 mortality rate



To summarize the situation at the Fernald: On September 1, there were 1,566 residents. Within 3 months, 50% had come down with the flu, and 85 had died. The mortality rate was 8 times the national average. Among the more disabled in the North Building, 25% of the residents died. These are truly appalling statistics, and heart-breaking because the state went to great lengths to erect tent hospitals in a number of towns, but did nothing to help the vulnerable and institutionalized people in its care.

INFLUENZA AT FERNALD

- Already short-staffed due to war
- With 118 beds, infirmary was overwhelmed
- Residents lived in open wards with no way to isolate sick
- Many residents were physically vulnerable
- With so many residents and staff sick, some residents helped with care
- Deceased buried in home towns or Mount Feake & Calvary Cemeteries



North Building residence for more-disabled adult males

There were several factors that led to the high death rate at the Fernald. They were short-staffed due to the war. The residents lived in large, open wards, making isolation of the sick was impossible. There were only 110 infirmary beds, which, in other situations, would have been sufficient. But with 778 sick residents and 55 sick staff members, the infirmary would have been overwhelmed. With so many staff members sick, the Fernald resorted to having the abler residents help care for the sick. In addition, many of the residents were more physically vulnerable than the general population. By the way, Fernald residents who died were buried in their hometowns or at Mount Feake and Calvary Cemetery. They were not buried on the grounds. The Metfern Cemetery was not established until 1947.

SOME WALTHAM VICTIMS



Mother & son



Henry C. Hall, druggist, age 74

The grim epidemic affected entire families, and in some cases, killed more than one in those families. 32 year-old Frank Woodbury was an instructor of marine engines at Franklin Institute of Boston, and lived with his parents on Bear Hill Road. He contracted the flu on September 22, and after four days, developed pneumonia. He died at home 2 days later on September 28, on the same day as his mother, Mary, who also died of lobar pneumonia. They are buried together at Mount Feake Cemetery.

57 year-old Mrs. Catherine Doyle, an Irish immigrant, and wife of Peter Doyle, of 76 Cushing Street died on Oct. 12 after a 6-day bout with influenza and bronchopneumonia. One week later, her 26 year-old daughter, Catherine, a sales clerk at Woolworths, was sick with bronchopneumonia, and she died two weeks later. Notre Dame nuns, Sister Anne of St. Helena and Sister Thomasina, had visited them before October 12 and reported that a girl of 18 was recovering from a relapse, a girl a little older (this would be Catherine) was declared hopeless; a little girl of 4 showed early symptoms, and so did the helpless mother. The father, Peter, was very attentive.

SOME WALTHAM VICTIMS



Mother & son



Henry C. Hall, druggist, age 74

Hall's Corner was the intersection of Crescent Street and Moody Street, and was named for Henry C. Hall, who had a substantial apothecary business on the corner. He lived at 107 Crescent Street, and was 74 years old in 1918. He had been sick with the flu for ten days when he died of bronchopneumonia on October 21.

On Bright Street, Patrick J. Kelly, a 33 year-old ironworker at the Metz plant, lived at 147 Bright Street. Anna Bachman, head of the district nurses, requested that Sister Anne of St. Helena and Sister Clare Cecelia visit him immediately, since she thought he would not live through the night. Sister Anne grabbed a cup of coffee for herself, a blessed candle and a prayer book, and was out the door in 5 minutes. Perhaps on account of their care and prayers, Patrick did not die and eventually recovered.

Sister Evelyn McKenna, a Notre Dame nun, gave me a copy of an article describing the work of the Notre Dame sisters in the 1918 flu epidemic. The article described the sisters care of the Lawless family, who I think lived on Church Street. Six people in the large family were sick with the flu including the father, a young son, and four daughters. The mother was overwhelmed caring for all of them, until the arrival of the nuns.

Response to Influenza in Waltham

Once the city recognized the seriousness of the threat to public health, various committees, boards and institutions sprang into action to help the sick, both at home and in the hospital.

WALTHAM HOSPITAL

- All wards converted to flu care
- 110 beds
 - 68 general
 - 10 maternity
 - 32 contagious
- 381 flu patients Sep 9 – Feb 15
 - 87 deaths
- 36 nurses employed at start in Sep 1918
 - 48 nurses contracted flu by Feb 15
 - One ward just for sick nurses



Waltham Hospital in 1920s

Waltham Hospital had 110 beds, 68 were for general medical/surgical patients, 10 for maternity patients, and 32 for patients with contagious diseases. When the number of flu cases became overwhelming, the hospital stopped admitting all other patients except for flu cases. Nevertheless, the hospital was hampered by the shortage of nurses, and the number of staff who contracted the flu. The hospital treated 381 flu patients from September 1 through February 15, and in that time, 87 patients died. The case mortality rate was 23%, reflecting the fact that hospitalized flu victims were much sicker. The hospital started out with 36 nurses on September 1, by February 15, 48 nurses had contracted the flu. The hospital reserved one ward just for sick nurses.

WALTHAM HOSPITAL

- President – Cornelius J. McCormick, M.D., 825 Main St.
- Vice-Pres. – Joseph R. Worcester, 102 Greenwood Lane
- Secretary – Mrs. George B. (Mary) Beaman, 327 Lexington St.
- Matron or Supervisor of Nurses – Annie B. Melick, 716 Main St.



Dr. Cornelius J. McCormick



Dr. Henry Wood

Dr. C. J. McCormack was the president of the hospital, and Annie Melick, a graduate of the Waltham Training School for Nurses, was the nursing supervisor. Annie Melick was a native of Saint John, New Brunswick, and had previous experience as a head nurse at Waltham Hospital. But she had spent several years working as a private duty nurse, and at a private hospital run by Dr. Charles Baker at 107 Adams Street, and had been in charge of the Waltham Baby Hospital. Unaware of the impending calamity, she reluctantly accepted the position of Matron or Supervisor of Nursing at Waltham Hospital in April 1918.

WALTHAM BABY HOSPITAL

- 755 Main St (in back of Universalist Church)
- Mrs. Elizabeth A. Jordan, president
- Miss Harriet A. Chapman, supervisor
- Took in babies whose parents were too sick to care for them



Established in 1900, the Waltham Baby Hospital was located in the rear of 755 Main Street in back of the Universalist Church. This would be in back of the Boys and Girls Club, if the hospital were still standing. Although the mission of the hospital was to care for sick babies, during the flu epidemic, they took in many well babies whose parents were too sick to care for them.

WALTHAM DISTRICT NURSES ASSOCIATION

- HQ at Waltham Training School for Nurses
 - Red Cross temporarily moved to WTSN
- Nurses released to Waltham Health Dept. in Sep 28 – Oct 23
 - 3,068 visits paid to 636 patients
- Anna E. Backman, Supervisor of Nurses
 - Was put in charge of all nurses for Board of Health
- 15 nurses on duty/day during epidemic



The Waltham District Nurses Association was the visiting nurse agency of this time period. They were head-quartered at the Waltham Training School for Nurses on Main Street. The Red Cross had been located in the Lawrence Building on the corner of Common Street, but relocated to the Training School during the epidemic. On September 28, the district nurses were released to the Waltham Health Department, as were the school nurses. Anna Backman of the district nurses was put in charge of all the nurses for the Board of Health. Since the majority of flu patients were sick at home, the district nurses were extremely important. In less than one month, they paid over 3,000 visits to 636 patients. They had an average of 22 nurses and volunteers on duty per day. Anna Backman, and her sister Alice, who was in charge of the school nurses, were the daughters of Axel and Augusta Backman of 55 Grant Street. Previously, Anna Backman had been in charge of the contagious ward at Waltham Hospital, had been a head nurse at Robert Brigham Hospital, and in 1917, became supervisor of the Waltham District Nursing Association.

CAMP JENSEN, WALTHAM

- Located on Paine estate, off Stanley Rd.
- Set up by State Guard under military administration on October 9
- Intended that all flu patients be sent there
- Doctors at Waltham Hospital refused to send patients
- Removed on October 19



Tent hospital, Corey Hill, Brookline

On September 28, city officials begged the state for a doctor, 8 nurses and a 35-bed tent hospital. The first military tent hospital had been set up on Corey Hill in Brookline under strict military discipline and scrupulous hygiene protocol. Convalescent patients were treated by exposure to fresh air and sunlight, and the mortality data at Corey Hill tent hospital showed lower rates of death. So a number of tent hospitals were set up under the supervision of the Massachusetts State Guard around the state in Ipswich, Lawrence, Brockton and Newton. Open air treatment of tuberculosis was an accepted treatment protocol at this time. No scientific evidence has shown this to be an effective treatment, but the provision of uncontaminated fresh air and exposure to sunlight may have reduced the transmission of bacteria that caused pneumonia.

CAMP JENSEN, WALTHAM

- Located on Paine estate, off Stanley Rd.
- Set up by State Guard under military administration on October 9
- Intended that all flu patients be sent there
- Doctors at Waltham Hospital refused to send patients
- Removed on October 19



Tent hospital, Corey Hill, Brookline

Once the decision to erect a tent hospital had been made, Company B of the state guard worked quickly to set up Camp Jensen in 1 day. This was a 68-bed tent hospital on the grounds of the Paine estate at the end of Stanley Road. It was named for Sergeant Walter Jensen of Palmer Street in Waltham, who had died of war injuries on August 4. The plan was that all flu patients who were in Waltham Hospital would be transferred to Camp Jensen, thereby opening up beds for patients suffering from other maladies. Other people suffering from the flu at home would be admitted, some forcibly if necessary. But the doctors at Waltham Hospital refused to transfer their patients, and there was a great deal of finger-pointing between the president of Waltham Hospital, Dr. McCormack, and Dr. Fuller, the director of the city health department. The tent hospital was removed on October 19, due to the lack of patients, and problems with setting up the convalescent beds because of inability to provide a sanitation system.

TENT HOSPITAL CONTROVERSY

- Waltham Hospital feared it was a back-door attempt to establish a 2nd hospital
 - Some doctors claimed discrimination
 - Same problems in other cities
 - Control of hospitals an issue then
- Doctors feared loss of control; politics
- Epidemic nearly over
- Some questioned efficacy of fresh air therapy

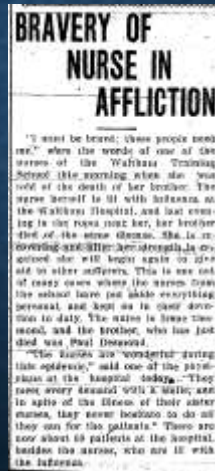


Tent hospital, Lawrence, Mass.

So why would Waltham doctors be against what seemed to be much needed help? Well, the tents and camp were set up, but there were no doctors and only 2 nurses provided to staff it. So doctors who were already stretched beyond their physical endurance, would have to cover another location, on the other side of the city. The doctors at Waltham Hospital feared this was a back-door way of establishing another hospital in a city that was too small to financially support two hospitals. This fear was not unfounded, since this had happened in Boston and Cambridge. In Waltham and other cities, who was appointed to hospital staffs was sometimes politically determined. Worthy doctors who were not part of the social and political establishment could not get admitting privileges, and this accusation had been made in Waltham also. In addition, by mid-October, the number of flu cases and deaths from flu were dropping off substantially. Finally, the assertion that open air treatment of flu resulted in far-lower mortality rates was essentially anecdotal, and had not been proven. Some now theorize that the strict hygiene and military discipline was the reason for the lower mortality at the military hospital on Corey Hill. Some doctors did not believe that exposure to fresh air and sunshine was an appropriate treatment. Camp Jensen was closed among bitter recriminations on October 19.

WALTHAM'S HEROES

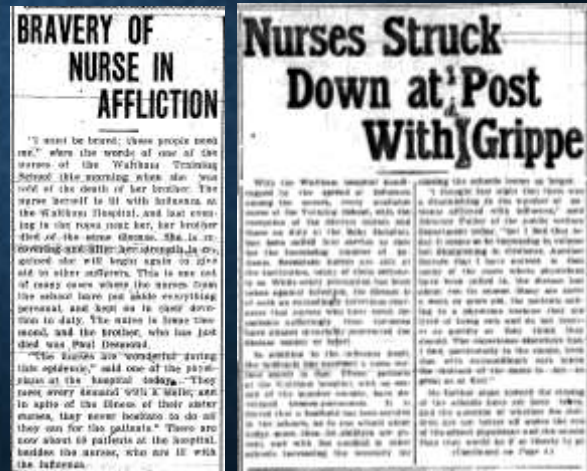
- Doctors
- Waltham Hospital nurses
- Waltham District nurses
- Volunteers
 - Schoolteachers
 - Volunteers
 - Sisters of Charity; Notre Dame sisters
 - Automobile drivers



Honoring the bravery and sacrifice of the Waltham soldiers and sailors who died during WWI is deservedly warranted. But there were some unsung heroes of this public health emergency who knowingly risked their lives to help the sick and dying in Waltham. These were the doctors and nurses at Waltham Hospital and the public health service, and volunteers comprised of schoolteachers, nuns, Red Cross volunteers and drivers. Anna Backman, who headed the distribution of home patient care, described the best nursing assistants as the religious sisters: the Sisters of Charity from St. Charles; the Notre Dame sisters from St. Mary's, and the Notre Dame sisters from their novitiate on Newton Street.

WALTHAM'S HEROES

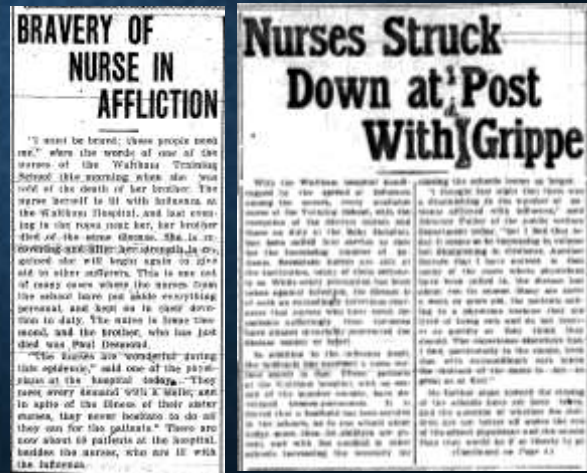
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The devotion and bravery of the nurses were exemplified in Irene Desmond, a student nurse, from the Waltham Training School. While she was recovering from the flu, she learned of the death of her brother, Paul. But she went back to work, saying “I must be brave; these people need me.” Irene, by the way, died just 2 years later at the age of 24 years. One physician remarked, “The nurses are wonderful during this epidemic. They meet every demand with a smile, and in spite of the illness of their sister nurses, they never hesitate to do all they can for the patients.” The newspaper also noted that nurses caring for patients suffering from influenza almost invariably contracted the disease sooner or later. So the risk for nurses and their assistants was enormous. Flu patients who suffered from cytokine storm (an inflammatory response syndrome) sometimes bled out from their eyes and ears, coughed up quarts of blood-tinged fluid, thus soiling themselves, their clothes and their bed linens. In tending to such patients, nurses comprised the front lines in this patient care, and found themselves dangerously exposed to the virus. The masks and gowns of that era did little to protect them.

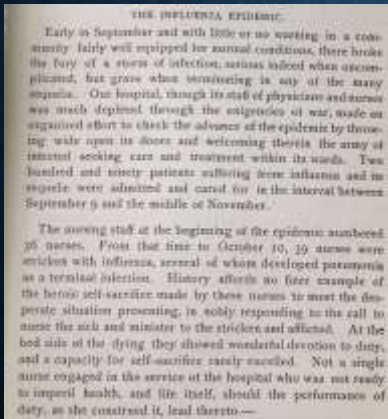
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Four nurses died from influenza or its complications in Waltham. Two nurses were private duty nurses - David Chaisson died at 90 Dale Street; and Grace McKenney had been living with the family of her younger sister Edna Gibbs for 3 ½ years when she died at the Gibbs home at 51 Harris Street. Two nurses or attendants at the Fernald School died. Maud Snook, who was from Nova Scotia, died of influenza and from ingesting denatured alcohol when she was delirious. The other nurse was 25 year-old Olive Daniels. Although many hospital, district and health department nurses contracted the flu, and some developed serious cases of pneumonia, none died.

WALTHAM'S HEROES



The annual report of the Waltham Hospital described the heroism of the nurses during the flu epidemic. “Early in September and with little or no warning in a community fairly well equipped for normal conditions, there broke the fury of a storm of infection, serious indeed when uncomplicated, but grave when terminating in any of the of the many sequelae. Our hospital, though its staff of physicians and nurses was much depleted through the exigencies of war, made an organized effort to check the advance of the epidemic by throwing wide open its doors and welcoming therein the army of infected seeking care and treatment within its wards. Two hundred and ninety patients suffering from influenza and its sequelae were admitted and cared for in the interval between September 9 and the middle of November. The nursing staff at the beginning of the epidemic numbered 36 nurses. From that time to October 10, 39 nurses were struck with influenza, several of whom developed pneumonia as a terminal infection. History affords no finer example of the heroic self-sacrifice made by these nurses to meet the desperate situation presenting, in nobly responding to the call to nurse the sick and minister to the stricken and afflicted. At the bed side of the dying they showed wonderful devotion to duty, and a capacity of self-sacrifice rarely excelled. Not a single nurse engaged in the service of the hospital who was not ready to imperil health, and life itself, should the performance of duty, as she construed it, lead thereto. — “ The same could be said for the district and health department nurses, school teacher volunteers, as well as the Sisters of Charity and the Notre Dame Sisters.

CAN IT HAPPEN AGAIN?

Dangers

- H5N1 bird flu low probability but high impact (60% mortality)
- SARS coronavirus epidemic in 2003 had 10% mortality rate
- Limited medical resources if pandemic occurs
- Global travel speeds spread

Mitigating factors

- Antibiotics & antivirals
- Ventilators & ICU's
- Vaccinations
- Cumulative protection of past flu vaccinations
- New technologies & reduced lead time for developing vaccines

Scientists have learned a great deal about the 1918 influenza pandemic that infected 500 million people worldwide. By reconstructing the dna of the virus, they have learned that the virus was a recombinant avian virus that mutated so that the virulence and transmissibility were increased. Can another pandemic occur now? They have been carefully watching the H5N1 bird flu, which has a 60% case mortality rate, but so far has not spread easily among humans. They all fear a scenario whereby genetic material from this bird virus combines with a human virus so that the transmissibility is increased, while the high mortality rate remains the same. If another flu virus causes widespread acute respiratory distress syndrome (ARDS) in a large number of the population, limited hospital resources would be strained. And as we have seen just recently, air travel has accelerated the transmission of viruses from the other side of the world.

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But many people who died in the 1918 epidemic, died of bacterial pneumonia, which can be treated with antibiotics now. And antiviral medications can lessen the effects of a flu virus. We now have ventilators and intensive care units to treat people suffering from ARDS. And most importantly, we now have vaccines that prevent or lessen the impact of flu viruses. And the past vaccinations have a cumulative effect. One of the problems with flu vaccines is that the lead time to manufacture vaccines, and the viruses can mutate in the interim, thereby reducing the effectiveness of the vaccines. Scientists are currently working on speeding up the production of vaccines to reduce the lead times.

Waltham has joined with surrounding communities to plan for a pandemic, in conjunction with the Massachusetts Department of Public Health. Waltham belongs to a regional coalition that covers Metro Boston and the suburbs. The city has planned for mass immunizations along with triage and quarantines, and works with Mount Auburn Hospital and Newton Wellesley Hospital to plan for potential epidemics in the future. So yes, a flu pandemic can occur again, but this time we have more treatments at our disposal, and our city and state officials have a plan worked out in advance.