Sarah Alger : Welcome to Proto, a podcast that explores the frontiers of medicine. I'm Sarah Alger.

Dr. Martin Hers...: And I'm Dr. Martin Hersh. Today, we're going to flash back a hundred years to one of the worst epidemics in human history. The flu of 1918 caused a wave of illness that shocked the world.

Tim Stevens : The big characteristic difference of this flu is that young people and active people, the 18 to 24 year olds were the largest group to be effected. We'd never seen that in a flu before.

Sarah Alger : That's public health historian, Tim Stevens, who will tell us why even reporting on the flu in 1918 carried a certain amount of danger. And we'll look at promising research today that may pump the brakes on flu outbreaks in the future.

Dr. Martin Hers...: Coming up on this episode of the Proto Podcast brought to you by Massachusetts General Hospital.

Sarah Alger : This year, 2018, began with a particularly dangerous flu season in the US. It caused hospitalizations in the hundreds of thousands, and while the Centers for Disease Control and Prevention are still calculating deaths from flu over the course of the year, the number is thought to be unusually high.

Dr. Martin Hers...: It was in some sense, a reminder of what can happen and what did happen exactly a hundred years ago. The flu that ranged from 1918 to 1920 was the worst we've ever seen. It infected anywhere from a third to half of the planet. By the time it was over approximately 15 million people had died, though some estimates put that number as high as a hundred million.

Sarah Alger : My co-host today is Dr. Martin Hersh. He's a senior physician in the Infectious Disease Service at Massachusetts General Hospital and a professor of medicine at Harvard Medical School. He's a noted virologist who has, among other things, worked at the forefront of the fight against HIV/AIDS, served as a long-standing editor of the Journal of Infectious Diseases, and won numerous lifetime achievement awards. Martin, welcome.

Dr. Martin Hers...: Thank you, it's a pleasure to be here.

Sarah Alger : So, we have a flu season every year. Why is one year better or worse than another?

Dr. Martin Hers...: Well, it really depends on what virus is circulating. The virus is always changing to try to outwit the host immune response, and sometimes it does, and sometimes it doesn't. And the vaccine that we produce each year may also match the circulating virus in some years and other times it doesn't. So, all of these affect whether a particular flu year bad or not so bad.

Sarah Alger : Can we tell in advance if a particularly bad virus is going to strike?

Dr. Martin Hers...: Well, sometimes we can, because what happens here in the winter months is often happening six months or so before in the Southern hemisphere. And that's what happened this past winter, for example, we knew that this was going to be a bad year because there was not a good vaccine match in Australia and other places in the Southern hemisphere, and that's exactly what happened here.

Sarah Alger : We know that the virus in 1918 was particularly bad. What do we know about that strain in particular?

Dr. Martin Hers...: Well, we didn't know at the time that a virus actually caused influenza, the influenza virus wasn't really discovered until the 1930s, but we surmise that it was an infectious agent. When the virus was finally reconstructed it was shown to be particularly virulent, and having important effects on the host immune response, which made it a particularly bad virus to have.

Sarah Alger : So, what did doctors know about the flu in 1918 and what tools did they have to fight an epidemic like this?

Dr. Martin Hers...: Well, they thought it was an infectious disease and they used the tools that had been used previously with tuberculosis and other infectious diseases, and they tried to protect the public by wearing masks, by avoiding interaction with people, such as in public events, like sporting events and theatrical events, and that's about the best we had, trying to avoid coming into contact with the virus.

Sarah Alger : So, would you say that sort of the limitations on public gatherings and things like that, is that the extent of how daily life was affected for people living through it, or were there other sort of public health measures that affected people?

Dr. Martin Hers...: Well, certainly there were a lot of public health measures instituted because of the severity. Our hospitals were set up in outdoor places, even in churches and schools because so many people were affected. So, it had an enormous effect on the population, not only in the United States, but across the world.

Sarah Alger : To what extent is the 1918 virus on the minds of modern day physicians?

Dr. Martin Hers...: It's always on the mind of today's physicians. Since 1918, we've had four other pandemics when a new virus sweeps the world and causes a lot of disease, none as bad as 1918, but we're always thinking when the next one comes, will we be prepared? Today, we have vaccines, we have antiviral drugs, we have antibiotics, so perhaps it won't be as bad as it was back then, but on the other hand, we have a lot more people, and we have people traveling much more than they used to, and it takes only hours to circumnavigate the globe, plus any new influenza is going to cause a big problem worldwide.

Sarah Alger : Thank you, Martin. Coming up, not everyone knew how bad the outbreak was a hundred years ago, even as they were living through it. We'll hear from a blog that puts you in their shoes, with the daily dispatches from the newspapers of 1918.

Dr. Martin Hers...: That's coming up on the Proto Podcast.

Sarah Alger : You're listening to the Proto Podcast from Massachusetts General Hospital. I'm Sarah Alger, and my co-host for this episode is virologist Martin Hersh.

Dr. Martin Hers...: The flu of 1918 caused more deaths than either of the world wars or the death toll of HIV/AIDS so far. Indeed for the past hundred years no other single event has taken so many lives.

Sarah Alger : But if you were alive in 1918, you might not have known how big the problem was, and that's because it happened during a curious moment in the history of newspapers.

Dr. Martin Hers...: The United States entered the First World War in 1917. The president and congress moved swiftly to make sure that everyone was behind the war effort. They created a series of laws and executive orders, including the Sedition Acts of 1918 that made speaking out against the government or the war a crime.

Sarah Alger : So, stories about the growing flu epidemic, which struck down soldiers and traveled along the front lines, fell into a gray zone. It was bad news and bad news was hard to report, maybe even illegal. It was nearly impossible then to follow the news about a major health catastrophe. This year, one website is ambitiously trying to recreate that experience for modern readers. The blog is called 1918 Influenza One Day at a Time. Every day it posts one newspaper article from that year of the outbreak, on the hundred year anniversary of its first publication. It is the creation of health historian, Tim Stevens. His collaborators are Jessica Taaffe, a contract microbiologist at the National Institute of Allergy and Infectious Diseases, and John Walsh, a faculty member at Vanderbilt University and coauthor of an upcoming book about influenza.

When I spoke to Tim about his blog, we began by having an actor read some of the actual news reports from a century ago. This first one is a clip from the Manchester Democrat, an Ohio newspaper, and it's from February 13th, 1918.

Speaker 4: Word from Captain Grossman. WW Matthews received a letter from Captain WF Grossman of Deming, New Mexico, stating that he has just been released from the hospital after three weeks of severe illness. Captain Grossman says that there are only two cases of pneumonia and one of blood poisoning among the Company H boys at the present time, and also that these three cases are on the road to recovery. He also acknowledged the receipt of a draft for $16 from the Thursday afternoon club of the city. Manchester people generally will be pleased to learn that Captain Grossman is out of the hospital and the other boys are doing well.

Sarah Alger : So now, this is a bit puzzling because this seems like good news, were there are a lot of good news stories like this coming out of the war?

Tim Stevens : Yeah, this was an article from February, and at that point, almost no sense of the influenza and what we would see later in the year was apparent. This was a type of typical report that the boys that had been sent away ultimately to be sent to the killing fields of France were healthy and thankful for all of the patriotic support they were getting from their hometowns.

Sarah Alger : So, to continue on this theme about what conditions these soldiers were training and living in, here's a clip from the Fort Wayne Sentinel from February 26th, 1918.

Speaker 4: The five-foot barrage, practically the only way people catch coryza, pharyngitis, tonsillitis, influenza, and tuberculosis is by venturing under the five foot barrage of some cougher or sneezer. Beyond the five foot barrage, one is comparatively safe from the infectious, germ laden, invisible spray. United States Army medical officers explain the prevalence of pneumonia among soldiers by stating that the floor and airspace in the barracks were less than sanitary rules demand, and therefore it was not possible to have five feet of space between heads.

Sarah Alger : When they talk about military camps or cantonments what role did they play in the spread of the flu?

Tim Stevens : Play a huge role. At this point in our blog in March-April, it hasn't been fully comprehended, but the fact that the first case is often pointed to as having come from these camps, their conditions that we just heard described, the amount of travel, the number of people who were living in such close confinements, perhaps without the best sanitary conditions, clean water, clean food, it's hard to overestimate how important they were to its spread.

Sarah Alger : Here's a clip from the Associated Press, Night Wire from August 17th, 1918.

Speaker 4: Must strain kisses to avoid influenza. Persons who want to avoid the Spanish influenza or the common garden variety of the same disease were warned by the New York City Department of Health today not to kiss except through a handkerchief. While advising oscillatory restraint, Health Commissioner Copeland announced that investigation had failed to show any signs of the Spanish affliction aboard the Norwegian steamship, which arrived recently with many suspected cases.

Sarah Alger : So first off, what does oscillatory mean?

Tim Stevens : It's kissing, it's often related to kissing.

Sarah Alger : All right, so this clip is from August, is the flu in full force by then?

Tim Stevens : By this point in August, the event is in full throttle and it did exercise a lot of the time effort of health authorities, it did not necessarily change everyone's behavior everywhere. The big characteristic difference of this flu, and it might explain why less of these actions took place and why it became so big, is that young people and active people, the 18 to 24 year olds, actually were the largest group to be affected, and that we'd never seen that in a flu before, the old and the very young, the children, young children, and very old were primarily the victims in past flues.

Sarah Alger : Tim, would you say that newspapers were the primary source for health messages like this?

Tim Stevens : Yes, and we see going into September and October when probably 75% of all of the articles in those two months occur describing influenza, an echo chamber builds up as the event begins to become noticeable in more communities.

Sarah Alger : So, when you say echo chamber, do you mean of information that is correct or information that is maybe a little too optimistic or some of both?

Tim Stevens : Absolutely some of both, and we see a number of articles where the Spanish influenza may have been killing people in the East, but when it gets to our city, we've got the best of care, we have the physicians who will take care of us, so.

Sarah Alger : So, to get to our last clip here, which is from October 3rd of 1918, this is from the Ward County Independent, which is a paper from North Dakota.

Speaker 4: Spanish influenza reaches North Dakota. The Spanish influenza appears to be sweeping across the country from coast to coast, and several cases were reported in Minot last Saturday for the first time. There is no particular occasion for alarm, physicians state, although the diseases resulting in a large number of deaths in the East. It has been prevalent in the European countries and was brought to America and is now working westward. Last Thursday, there were more than 6,000 cases in the country's military camps resulting in more than a hundred deaths. Congress has appropriated a million dollars to fight the disease. It is claimed that a serum has been discovered that does much good in killing the germs, but the serum is not generally distributed yet.

Sarah Alger : So, this one I find particularly interesting. There's no particular occasion for alarm, although the disease is resulting in a large number of deaths. I mean, in that one sentence, it's pretty interesting. So, given a clip like this, would you say that the newspapers did a good job at covering the flu's full impact?

Tim Stevens : Were the sources that they had perfect? Far from it, and I think that's also within a context in which 40 American newspapers were shut down for the length of the war, 25,000 Americans were incarcerated for treasonous expressions, anti-government expressions, so within the context of what we're looking at here, I think you see a press that did not catch up with the influenza and describe it back to the population reading the newspapers.

Sarah Alger : So again, the name of the blog is 1918 Influenza One Day at a Time. Thank you, Tim.

Tim Stevens : Thank you very much, appreciate it.

Sarah Alger : My co-host in the studio is virologist Martin Hersh from MGH. It seems as if 1918 created very specific circumstances for the flu to thrive. You had the war in Europe, you had the soldiers mobilizing and living in close quarters, you had this embargo in bad news that may have blunted the response. It's tempting to say that this epidemic was a fluke, that it depended on the war to get as big as it did, but is that true?

Dr. Martin Hers...: No, I don't really think so. I think the situations that you mentioned may have made it worse, but this was a novel influenza that we hadn't seen before, that the majority of the population had not been exposed to, and was particularly virulent, and that's what really caused the spread and the deaths we saw.

Sarah Alger : Compared to 1918, how are we doing? Are there any ways that we're more at risk of a dangerous outbreak today than we were then?

Dr. Martin Hers...: There are many more people today than there were in 1918, and it's much easier to travel from country to country and spread the virus across the world than it was in 1918.

Sarah Alger : And in what ways are we better prepared to fight the disease today?

Dr. Martin Hers...: Well, that's the good news, we now have antivirals, we have viral vaccines which are effective many years, we also have antibiotics to prevent some of the secondary complications, and we have much better surveillance systems than we had back in 1918, so we can predict what's coming down the road and better prepare for it.

Sarah Alger : So, as a clinician who has worked in this field for decades, do you feel cautiously optimistic or worried or some other emotion about where we are with research?

Dr. Martin Hers...: Well, I think the research has been very useful and I am cautiously optimistic. We will continue to have pandemics, but hopefully we will not have a repeat of 1918.

Sarah Alger : In the June issue of Proto Magazine we talk about the promising work towards a universal flu vaccine, a vaccine that could prevent most types of flu, how close are we to achieving that goal?

Dr. Martin Hers...: That's still a goal that has not yet been met. The NIH and the US government are going to be spending a lot of money trying to develop a universal flu vaccine over the next decade by using parts of the virus that are conserved from strain to strain and won't have to be changed every year to make a new vaccine. The new vaccines are also going to be designed to try to stimulate a broader range of immune responses. There are many efforts and there will be more, but we are still years away from a generally available universal vaccine.

Sarah Alger : Martin, thank you for joining us today. And listeners, thank you for tuning in to the Proto Podcast.

Dr. Martin Hers...: Thank you, today's podcast was produced by Jason Anthony, Bradley Klein, and Emily Silber.

Sarah Alger : Thanks also to our technical director, Adam Keller. You can find the Proto Podcast on iTunes and Stitcher. Please subscribe, and you can also follow Proto on Facebook and Twitter. You can also find the newest issue of Proto Magazine on protomag.com. See you next time.