Original Article

PANDEMIC INFLUENZA 1918-19: LESSONS FROM 20TH CENTURY TO THE 21ST FROM THE HISTORY OF MEDICINE POINT OF VIEW

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ABSTRACT

Global influenza pandemics are known for centuries. Starting from the 16th century, there are records of three pandemics per each century. The pandemics of the 20th century which are accurately recorded in detail are; "Spanish flu" where the factor was H1N1A, "Asian flu" which was caused by H3N2A and "Hong Kong flu" which originated from H3N2A. The heaviest panorama among these was observed in the "Spanish flu" of 1918 in which more than 40 million people were dead. The goals of this article are to investigate the literature in detail and to achieve some results to the 21st century's epidemics.

Keywords: Spanish flu; Influenza pandemics; History of infectious diseases.

INTRODUCTION

The influenza pandemic 1918-19 was one of the most catastrophic events in the history. Disease primarily affected the adults in the contrary with the general expectation to children and older people. The recent articles emphasized that the real mortality was 50-100 million. At the end of the First World War, humanity has been realized the presence of a common enemy which named Spanish Flu that killed more people than all the military forces. Some of the authors argued that, this pandemic led to the ending of the World War I (WWI). Contrary to this argument it is possible to say that under the war circumstances; namely the US's enormous army mobilization, broken of French lines by Germans and Paris bombardment; who care getting grippe?[1,2,3]

The onset and closing dates of pandemic seem to be important in the light of Turkey's history. On one hand this reflects the final days of Ottoman Empire, namely the agony days of "the sick man", we can see the name of Sultan Mehmed VI among the other statesmen who came down with it, like Japan Prince Yamagata and Queen Alexandrine of Denmark. On the other hand the founder of modern Turkey, Mustafa Kemal, got the cold just before he departed from Istanbul to launch the National Independence War in Samsun in 1919. Similar personal observations have seen in the biography of painter Fikret Mualla lost his mother to this disease when he was a teenage and accused himself to infect her from school. In Turkish language the "Spanish Flu" term starting to use since 1918. We can also find the term in Turkish literature, famous poet Nazım Hikmet had been used the Spanish flu as one of the descriptive element of Istanbul's atmosphere 1914-18 like the others: typhus, railway car trade, mobilization for war, the German top-boot. According to the general dissemination of the

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pandemic, a detailed description a of H1N1 pandemic on this country in the years of 1918- 19, has been drawn in the light of archive documents by the authors as another manuscript. This study has been shown that it is possible to argue that the 1918-1919 influenza pandemic had a significant impact on the territory of the Ottoman Empire.[4]

THE H1N1 PANDEMIC IN THE WORLD

Works on the pandemics generally have been shown an important subject from the point of medical history. Pandemics are factors that may also directly or indirectly influence the civilizations, social structures and institutions. Therefore, any contribution of medical history about pandemic will also be enlightening with regards to the political and cultural history, and the history of civilizations.

Hippocrates refers to a respiratory disease which is dated to December 412 BC. He mentions about the relation of this disease with the change of winds and its tendency of recurrence and complications that tend to turn into pneumonia.[1] In 1580, two Italian historians, Domenico and Pietro Buoninsegni, who believed that stars were disastrous elements that adversely effect the human health, were the ones who used term "influenza" for the first time and this term has been used for the next three hundred years. However starting almost from the beginning of 16th century every epidemics or pandemics recorded is named after a different country such as; The "Russian fever", the "Chinese sickness".[1] Many have defined this pandemic as "the last great plague". It is noted that the name influenza sounded ample until 1918 but especially with the second wave, this pandemic is described as almost in the lethality of a psychopath. Many people believe that this name was not sufficiently descriptive for a disease that caused the death of half of the world's total population and also caused the death one among every four American soldiers during the WWI. The pandemic appeared towards the end of the war and the level of its infectiousness was moderate in the beginning. The disease is said to have led to a decline of almost 25% in the life expectancy of Americans. New York Times reported that it is realized day by day by the Americans that the disease was actually even a bigger disaster than the war itself. Only in October of 1918, 400,000 Americans were dead due to pneumonia caused by this influenza. Another interesting point about the pandemic is that all these deaths found almost no place on the first pages of the newspapers; according to Greer,[5] these news were usually buried "into the depths of the ninth page with the concerns for patriotism". Therefore headlines such as "no need form alarm", "the pandemic is under control", "the pandemic wave will be broken in 1-2 days" are examples that demonstrate such a severe picture of mortality and disease was reflected with a groundless optimism in the history of the American public health. Americans received the first news about the pandemic from Spain, therefore they named the disease after the name of this country.[5] A very significant but hard to perceive fact is that the pandemic influenza (PI) killed millions of people in such a short time span as one year. Although the destruction caused by this disease is reflected to the statistics, Crosby[6] believes that there exists no instrument that adequately reflects the chaos experienced in the USA in 1918. PI not only had a very significant impact on the whole society but also left permanent traces on the individuals; the pandemic has "simply divided the lives of the individuals into two" as the writer Katherine Anne Porter states.[6] Kolata[7] notes that for Americans, the pandemic was a disease that caused a higher number casualties than the total casualties of WWI, World War II (WWII), the Korean War and the Vietnamese Conflict in just one year. If we take it as a detective story; there happened a mass slaughter 80 years ago but there is no one adjudicated in front of a judge as the responsible of this slaughter. Molecular pathologist Jeffery Taubenberger, who had discovered the genetic sequence of the virus that caused the 1918 pandemic together with Anne Reid, states with irony that they are trying to find out the murderer. Therefore, the reason why the population around 40 years-old were targeted, why the 1918 pandemic was such fatal, and the likelihood of the humanity to come across with another flu agent having similar virulence in the future have put in debate in 1990s.[7] Crosby[8] has noted that the devastation caused by the pandemic was only comparable with the devastation caused by the World Wars. He also stresses that Lloyd George, Clemenceau, Colonel House and Woodrow Wilson were also infected by the virus and the peace conference was about to abandon due to the reason that W. Wilson was almost dead from influenza, in April 1919.[8] The disease is named after Spain, because the first outstanding attack was started from Madrid, where more than 8 million Spaniards were infected by the virus. During the Madrid epidemic in the summer of 1918, the Spanish King, Alfonso the 13th, was also among the casualties in excess of 200,000. Being one of the worst examples in

the history of diseases, the disease started to be called the Spanish flu due to the fact that even a king was defeated by it.[3]

The pandemic is reported to spread in three waves:[3,5]

1. A moderate but fairly spreading occurrence in spring 1918

2. An utterly severe and devastating attack in fall 1918

3. A last attack in spring 1919: This last wave was more severe than the first wave but not as devastating as the second one.

While 10-20 % of the infected people suffered pneumonia in the first wave, this rate was determined to be 70-100 % in the second wave. The pandemic has widespread to all Europe with the mobilization of the military troops. We know that the British called it the Flanders flu while the German called it the Blitz Katarrh. In October 1918 some USA troops reported one death each hour while British reported 2000 deaths per week. All the countries successively experienced the unbelievable devastation caused by the disease, the Spanish Lady. It is interesting that the disease was personified into a Spanish Lady by a metaphorical transformation. We also know that some depicted the disease by making analogies between the three big waves and the three episodes of classical dramas.[9] According to Kohn[10] the pandemic progressed in a way that deserved the appellations, the Justinian Plague and the Black Death. In the beginning, the French called it "the mysterious flu".[10] Despite its solid mortality, there was no panic at the time since the people were rather interested in the losses suffered at the fronts of the WWI. The disease, which occurred with ordinary symptoms, could lead to severe pictures such as pneumonia, purulent bronchitis, mastoid abscess, and hearth conditions. Casualties were usually among those patients who were at an age between 20 and 40. The scientific knowledge accumulation of the time was insufficient to provide an explanation for this disease and there were charlatans both in the USA and in other countries that offer solutions to the disease with the claim of "absolute treatment". Following the ceasefire declared on November 11, 1918, the scary of the disease seemed to be tranquilized. The next year, it ceased to be a threat.

Military records relating to the WWI are quite revealing. For example, there are documents which demonstrate how the British Army was effected by the influenza pandemic; these documents show that influenza was among the major diseases, such as dysentery, malaria, diarrhea, gonorrhea, and sand-fly fever, which effected the 13th and 14th Divisions between October 1, 1917 – December 31, 1918. In these two divisions, 2082 people caught influenza (in regions, Kermanshah, Qasr-i Shirin, Bakuba, Hanikin and Kifri).[11] At the time, among the troops deployed in the basin of the Euphrates River influenza was the second disease right after dysentery which the soldiers applied to hospitals for. A total number of 1384 cases were recorded for applications due to influenza.[11]

Influenza was the most frequent cause of applications to hospital among the "Syren" Forces between September 1918 and September 1919. The number of those applicants to hospital was 442, where 15 being officers and 427 rankers. December 1918 among these dates was the period where most applications to hospital occurred (Northern Russia).[11] Between June 1918 and May 1919 the most frequent cause of sickness was influenza among the soldiers of "Archangel Force" who applied to the hospital. A total number 195 people applied to the hospital in October 1918, with the reason of influenza. In general a total number of 506 people were effected by influenza between June 1918 and May 1919.[11]

1918 was the year both the WWI ended and the heaviest pandemic of the modern history burst out. The world of 1918 is too much different from the world prior to the war. The maps changed, the empires collapsed, and new states emerged. These two global disasters caused the death of more than 100 million people and the pandemic influenza was responsible of a much higher mortality rate than the war.[12]

According to Barry;[13] 1918 was the year which the deadliest influenza of all times had emerged. This pandemic had caused only in 25 weeks what AIDS have done in 25 years. In only one year, it accounted for a disaster worse than what was caused by plague throughout the Middle Age.

Although some say that the Middle Age had many effects in 1918, it is no doubt that 1918 did not

belong to the Middle Age, and the story of this pandemic cannot be reduced solely to deaths and sufferings. Probably it was for the first time in history, science had a fight against a pandemic disease and the pioneers of the modern American medicine positioned themselves against this pandemic. The politicians and the commanders of WWI thus focused on another type of enemy. The number of the European and US military troops were roughly the same but the number of deaths from influenza in Europe was half of the number of the influenza deaths in the USA. A possible explanation for this situation is that the soldiers at the fronts encountered the first moderate wave and acquired immunity against the virus.[13] Various examples from across the world are enlightening about the prevalence of the disease; it is reported that in India, between 1918 and 1919, the influenza pandemic resulted in a mortality rate that was more than twice the overall mortality rate of smallpox and cholera together and killed millions of people.[14] Rajendra Kumar Sen, who was the doctor of a tea company in Assam, briefly expressed his observation as: "people are dying like flies".[3]

In late 1918, in the African continent, the disease led to a disaster with its intensity, spreading speed, and unresponsiveness to treatment. The disease is said to have reached South Africa by means of vessels and caused sudden deaths almost without any prior symptoms in South Rhodesia in October.[15] There are also evidences that demonstrate how the disease reached and spread in the distant regions like New Zealand.[16] Davies stresses a very important point: in 1918, the USA realized the most extensive human mobilization in its own history. We are talking about mobilization of more than 2 millions soldiers; 84,000 infantry crossed the Atlantic Ocean in March and 118,000 in April while new soldiers were still being recruited all across the country. Meanwhile, Germans penetrated the French lines on the March 21st and on the other hand Big Bertha continued to bomb Paris. Under all these circumstances, who would care about a simple catarrh or some coughing?[3] The German commander Erich von Ludendorff notes how it was woeful for him to listen to the speech of his personnel chief every morning reporting on how many soldiers got sick or died of influenza and how the troops are getting weakened.[3] Finally it seems possible to conduct new analyses by comparing the 1918 influenza pandemic with the Asian pandemic of 1957 and the Hong Kong pandemic of 1968.[17]

Pandemic also found a mutual meaning in the literature and used as a topic in some novels.[18,19,20] The literal analogy of James was: "the disease which suddenly arrived one night and shattered all health statistics looked like a robber who stole the treasure chest".[20] We should also add that there were many pieces of work written in a simple language to enlighten the people and also many caricatures were drawn relating to the disease.[21]

Considering the above mentioned facts, it is possible to say that Turkey was also influenced by this pandemic. As a matter of fact, while emphasizing that the disease did not discriminate between social groups, some writers also refer to the name of the Ottoman Sultan. The disease, which made Mary Pickford, the richest person in the world, bedridden in her house in Beverly Hills, also influenced the Danish Queen Alexandrine, and the last Ottoman Sultan.[1] It is reported that, among the British prisoners of war who survived the Siege of Kut and brought to Yozgat, Turkey, there were soldiers who died of this disease, and that the weather was cold, cold as ice.[1]

Another example demonstrating the significance of military records in this area is the data on the medical aspects of the WWI, edited by Macpherson, Horrocks and Beveridge.[22] It is possible to find great number of data about the German, Austrian, Turkish and Bulgarian prisoner of wars in Macedonia region. These data provide details of the ration given to the prisoners of war (the Turkish prisoners of war were provided with 8 oz. potato and vegetables for 3 oz. bread, 1 oz. cheese for 4 oz. bread, 3 oz. dried fruit or 1.5 oz. jam and 1.5 oz. rice for 1 oz. olives, 1.5 oz. cotton seed oil for 1.5 oz. olive oil; where the prisoners of war and workers were given mule and horse meat instead of regular meat, 1 lb regular meat was equivalent to 1 ¾ lb mule or horse meat (1 lb = 454 g) and include tables demonstrating the scales used for the calculation of the ration given to the Turkish prisoners of war.[22] Similarly, it is reported that influenza was the infectious disease that prevailed the most among the prisoners of war in the United Kingdom.[22] In general, it seems like the health of the prisoners of war was protected at a satisfactory level. In 1918, following the spread of the disease throughout the country, 34 of 35 deaths was due to virulent influenza in the Kegworth Camp. Following the inauguration of the new camp in Handforth in 1914 there were 19 deaths, of

which 11 were reported to be due to influenza in 1918. There is no data in these records stating if the Turkish prisoners of war were also affected by the PI or not. There is only one chapter mentioning about pellagra that appeared among the Turkish prisoners of war in Egypt. A research committee was established to investigate this issue and the committee determined that the disease existed before imprisonment. The data show that most cases were subject to systematical medical inquiries and similar symptoms existed before imprisonment. Besides military records, there are also studies analyzing the records of the disease at international level. The three main sources of country data are as follows: 1. sources on morbidity, 2. sources on mortality, and 3. sources on population.[23]

EPIDEMICS AND THE MEDICINE; HISTORICAL BACKGROUND AND A SOCIOECONOMIC ANALYSIS

Porter, a famous medical historian, mentions about the restraints of our knowledge on the historical development of medicine. We can compare the existing medical records to a few stars that appear in the sky in the night time; basically what is predominant is still the "darkness", not the stars.[24] This seems true both for the history of infectious diseases and the history of epidemics. The farther in time the topic analyzed goes back from the present day, the deeper darkness gets.

We see examples of fear from disease throughout the history. Thematically, in "The Four Horsemen of the Apocalypse", the first and the second cavalries who ride the white and the red horses symbolize the wars of conquest and the civil war. The third cavalry, who rides the black horse, symbolizes famine. The fourth horse, ridden by death, has a pale color. It represents the cold face of the death and rotting. Especially the 20th century seems to be an era where the fourth cavalier was defeated in terms of the infectious diseases. Although wars and famine still have impacts in many regions of the world, a significant success has been achieved against diseases such as smallpox and malaria. Many agents of disasters and epidemics have been widely eradicated by means of vaccination and antibiotics.[23]

The term "epidemic" which describes the infectious diseases, comes from two Greek words: "demos", which means "human", and "epi", which means "supra" or "proximity". The term was used as the title of a long chapter in *Corpus Hippocraticum* in around 500 BC. It is also used to define involvement of large masses; just like the "epidemic of despair" of Burke. The term has been used in medical English at least since the year1603.[23] At the time continent America was discovered, the Europeans who first stepped on the land found an isolated society who had knowledge about their own diseases and also familiar with their remedies.[25] The origins of more than four millions of Americans reach back to Indians and some note that there was even a larger Indian community during the pre-Columbus era. The models of their diseases have been transformed to a certain extent. During the pre-Columbus era, the communities had degenerative and parasitic diseases which reflected the characteristics of their hunter-gatherer and agricultural life styles. When Europeans reached these lands, they also brought their infectious diseases, such as smallpox, measles, and influenza. Starting from the first point of contact with Europe, these epidemics spread among the Indian communities throughout the continent. This is a significant example of the history of infections and their spread throughout the world. Towards the end of the 20th century, not only infections became global, but also societies became acquainted with the "modern diseases" such as diabetics, obesity, and cardiac diseases that are mainly caused by their life styles.[25]

In 1930s, scientists who used new electron microscopes showed that a tiny "cotton ball-shaped" virus was the agent of influenza. Virologists defined a genetic mutation which they called the antigenic shift; they are aware for a long time that new viral subgroups may emerge by the genetic mutation and cause influenza epidemics. New viral species can appear on animals such as ducks, chickens, and swine, which carry reservoirs of the genetically modified influenza virus, and they can be transmitted to humans from these animals. The generation of virus that gave rise to the 1918 pandemic was H1N1; in the beginning it was called "influenza virus type A" and then labeled as the "swine flu" upon being discovered in swine. In 1997, researchers from the US Army isolated this generation of virus from the lung tissues that were preserved during the autopsy of the soldiers that died due to the pandemic influenza in 1918. Virologists have always been afraid of emergence of a new generation of H1N1 that is as virulent as the one in 1918. Many epidemics originated from Asia, particularly China, where people lead a life close - together with animals such as ducks and swine which are the sources of the virus.[10]

It is possible to work out epidemics and pandemics, which are among the main determinants of the concepts of health and sickness, by elaborating on epidemic diseases and the changes they make in the human perception of disease.[26] The article published in Science in 1997 by Taubenberger, the scientist who has studies related with the 1918 H1N1 pandemic which also called the Spanish flu, almost created an earthquake effect. This article completely clarified the structure of H1N1 and left no question related with it.[3] Taubenberger also emulates his own study to "throwing a bomb". He says, since actually flu does not occupy a large place in science and there are not many scientists that are interested in this topic, his research might be called "the holy grail of influenza studies."[3]

Personification of the disease and its transformation into a Spanish Lady is an interesting outcome. Iezzoni, in his book dealing with how the disease was perceived and which senses it stimulated in the USA, speaks about PI as the story of death and oblivion, chaos, courage and fear: "While we thought we were leading a safe life in our homes, an actress came in and, of her own volition, neither show her face, nor did she talk at all; she put her fatal signature every time but always remained a big mystery. Although she did not give us her name, we called her the "Spanish Lady". She was wild and capricious, painfully fatal. She brought death here and there in three waves, according to Iezzoni, in three episodes of a classical drama." She was the influenza virus. She caused the most calamitous age of the humanity since the plague of the Middle Age, which was called the Black Death. As a result, half of the human population on earth caught the disease and 21-40 millions of people died out.[9]

DISCUSSION

How should we decide on which theory is of top priority among the theories of infectious diseases? Are there any rational criteria (such as integrity, reasonability, or effectiveness) to be used to make a decision or should we prefer a specific theory under the influence of political power and special sponsorship?[27]

How can we harmonize the theory and the practice at a higher level? Traditionally, medical practices were highly varied and sometimes inharmonious. Although there was a theoretical abundance, it was not much possible to decide whether these diversities in practice were a result or source of the theoretical variety. We were not able to talk about a normative method until the late 19th century.[27] Until then, it was difficult to determine a priori which theory should guide the medical practices and a posteriori which practices were justified.

How should we agree on medicine expressing itself as a science? The previous disputes on the etiology and treatment of and protection from cholera reflected a fundamental conflict about the scientific position of medicine. For a while, it was believed that it would be possible to successfully deal with cholera if medicine were to be defined as a social science. This interpretation was increasingly challenged, however, in the second half of the century.

Towards the end of the last century, the result of the abovementioned disputes was clear: in general, medicine has been practiced as a physical science equipped with a strong paradigm or model to explain and deal with infectious diseases. This so-called "infection model" included a specific etiology for specific diseases and a theory of applied rules on the specific treatment of these diseases. In May 1881, Pasteur and his assistants vaccinated the sheep and envisaged survival of these animals after the administration of a fatal dose of Bacillus anthracis.

Thus the success of medicine in discovery of epidemic diseases can be explained neither by the continuous accumulation of knowledge nor the linear progress of science. On the contrary, modern scientific medicine is a product of interruptions and discontinuity, a conflicting interaction of two different lines of thought. Each line, from its own perspective, has been able to present a rational restructuring of the evolution of medicine. Within its own conceptual framework, medicine should have a quantitative development. However, emergence of a new and fatal disease such as cholera necessitated perception of epistemological barriers and created real expectations for the quantitative development of medicine, particularly with respect to infectious diseases. The conflict between infectiousness and miasmatism led to a long battle where all possible weapons were utilized and this reflected a continuous motion among the allies.

With the inspiring "infection model", which was an output of this battle, modern medicine is illustrated by Rosen, "Whether scientific and medical knowledge is applied to health problems and the way this is done depend, not infrequently at all, on the interests and ideologies of politically and economically powerful groups, rather than medical or scientific validity." This is also illuminating for the possibility of putting a clear distinction between internal and external factors that have an effect on the accumulation of medical knowledge. *The medical* and *the social* are objectively inseparable. Modern medicine and its assumptions about the reality, scientific facts, health and sickness, and also itself, so to say, about what is actually "medical", cannot be comprehended unless its historical and cultural contexts are taken into consideration. To sum up, medicine is a merely a specific expression of history and culture.

They were not only easily transmitted due to their high infectious nature but also more devastating in inverse proportion with the wealth levels of the societies. The more the nature was transformed by humans, the more the latter got infected by microorganisms; so, humans started to develop immunity mechanisms and thus started to live together with such microorganisms. A compromise emerged between the offender and humans; humans would survive but microorganisms would continue to spread pathogens. Immunity is a key concept in the history of infections. There are examples which demonstrate that if we maintain a close relationship with a certain pathogen for a sufficiently long time, we learn to deal with the disease caused by that pathogen.

The swine flu, which has led to a widespread fear in all over the world since the end of April 2009, is in fact a disease whose agent is the influenza A H1N1 virus. Therefore, it immediately came to mind that it could have aspects similar to those of the 1918 pandemic, and certain similarities were underlined with respect to two cases. It might be argued that, compared to the agent of the 1918 pandemic, influenza A H1N1 virus poses a higher risk of transmission throughout the world in a much shorter time period. However, the world of the early 20th century that was visited by H1N1 was quite different from the world of the early 21st century for the virus to make a second visit. While the mortality rate was 2% in 1918, it was much lower in 2009 due to several factors, and today we can envisage that it will not lead to a pandemic of the previous scale.

Socioeconomic analysis of infectious diseases reveals certain interesting connections. One of them is that HHS (the US Department of Health and Human Services) transferred USD 25 million to Roche for drug services and Roche, in turn, transferred 20% of this fund to Gilead. Another interesting fact is that since the emergence of the swine flu virus, the company shares of the mask producing company 3M and drug and vaccine producing companies such as Gilead, Glaxo Smith Kline, and Novavax have climbed in stock markets. According to Dr. Leonard Horowitz, a specialist on infectious diseases, there is the Anglo-American "vaccine line" behind the pandemics of influenza A H1N1 virus and avian influenza. There are claims that the swine flu virus was created as a hybrid virus during research.

The health sector has long abandoned preventive medicine and started to aim and prioritize making money out of sicknesses. Today the picture is almost that the drug is developed first and then comes the disease. Human life and hopes are subject to the industrialized commerce. The state of affairs, already defined by Ivan Illich in 1970s, point out to that direction.[3]

The "Spanish flu" killed more people in one year than number of those infected by AIDS in twenty years. AIDS is experienced like a sort of tragedy, and its infection is almost a death warrant. Yet, on the other hand, we cannot know when and where the next H1N1 pandemic will burst out. Besides, although we know how to protect ourselves from HIV, as we cannot abandon breathing, do we know how to protect ourselves from H1N1?

There are writers who emphasize that the 1918 pandemic, which they believed was an ambiguous start, was not actually the end of the story.[28] Similarly, certain writers such as Smith had the foresight in 1940s to speak of influenza as "an unfinished matter".[29] The swine flu pandemic of 2009 confirmed that they were right.

Many specialists claim that, although it is not possible to know its time and virulence, another influenza epidemic will occur. In this respect, the WHO's call in 2004, which invited all countries to be prepared for a new estimated pandemic, seems quite meaningful in 2010.[30] A scientist who

participated in the Cape Town conference said, "we know how to avoid AIDS, but not influenza," he was actually expressing the despair of a global world against a sickness which deemed to be "simple."[31] Short incubation periods, ability to spread via respiratory activity and factors such as temperature and humidity contribute to the transmission capacity of the virus.

It is possible to ask a few interesting questions. Could the Spanish flu spread so fast if there was not a war in 1918? Would it eventually turn into such a mortal pandemic?

If strong industrial countries had not been affected by the flu during the war, the background of the battles would not facilitate the spread of the virus so much. Existence of a horrible war turned a silent virus into a much more fatal one. On the other hand, even if there is no war, we have no guarantee when an utterly widespread virus like influenza might turn into a structure capable of killing large numbers of people.[31]

CONCLUSION: LESSONS FROM 1918-19 PANDEMIC INFLUENZA TO THE RECENT DAYS

According the scientific literature three pandemics in the 20th century has been occurred:

1. 1918 Spanish influenza, H1N1
2. 1957 Asian influenza, H2N2
3. 1968 Hong Kong influenza, H3N2, only 1918 virus was associated with high mortality among them.[32]

World War I ended in 1918 and in the aftermath of the war the all political and cultural order was changed in Europe as in the other continents Asia and Africa. As the end of the war the allies occupied Istanbul, the capital of Ottoman Empire and the government collapsed. On one hand the Sevres Treaty created a real threat to the future of the Turks on the other hand, there was another threat on these days seems not to be a big one as the first one: pandemic influenza.

All eight genes of H1N1 virus are more closely related to avian influenza. Viruses than to influenza from any other species, indicating that an avian virus must have infected humans and adapted to them in order to spread from person to person. Thus PI may originate two mechanisms: reassortment between an animal influenza virus and a human influenza virus that yields a new virus, and direct spread and adaptation of a virus from animals to humans.

Knowledge of the genetic sequences of influenza viruses that predate the 1918 pandemic would be extremely helpful in determining the events that may lead to the adaptation of avian viruses to humans before the occurrence of PI. We could then conduct worldwide surveillance for similar events involving contemporary avian viruses.

We re-discovered the importance of basic hygienic rules in daily social life: washing hands, using refreshing towels…

We recognized some features of 21th century as a "helper" and/or "facilitator" factor to H1N1 such as air trafficking and globalization tools

We re-thought on the relationships between the drug industry and disease concept.

We re-thought on the different historical sides of the medicine: curability and protectiveness while discussing on the meaning of the flue vaccine recommendations.

We need to re-think and re-ask on the functions of the global bodies related with such as WHO to disclose conflict of interests of PI from the point of view of serious questions like *"WHO done wrong? Was the swine flu a fake pandemic?*[33] *Did the WHO exaggerate the H1N1 flu threat?"*[34]

1918-19 pandemic influenza will always be remembered represents another world which not yet globalized, not industrialized one and also as a predecessor of next centuries' pandemics which offer us some lessons in large scale, as well as in limited one too.

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