

The 1889-90 flu pandemic in Greece: a social, cultural and economic history with lessons for the 21st century

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SUMMARY

The 1889-1892 influenza pandemic is the first flu outbreak that can be demonstrated to have been truly worldwide in scope. Its initial spread, along with the successive waves, coincided with an uneasy period of economic and political instability in Greece. Greek historians have largely ignored this outbreak in a national setting and have exclusively focused on the economic crisis and social unrest of that era. As in other countries, it seems that in Greece, too, the case fatality ratio was low, but morbidity and public health issues gained importance. Culturally, it triggered the creation of a new terminology around disease and proved an inspiration for satirical magazines. The economic distress of large parts of the population contributed to the design of health measures of only limited impact, with the press being the main source for dissemination of

new health information. Despite being separated by 130 years, the 1889 influenza pandemic and the COVID-19 pandemic share some striking similarities. They both spread across transport lines and were followed by spotty and multifocal subsequent waves, disproportionately affected the poorest and most vulnerable, and led to neologisms, strong public health debates, and shifts in employment habits and measures. As we move forward into the 21st century, it is essential that we are able to reflect on such shared trends over decades, which are true because of common and interactive co-determinants of infectious disease outbreak emergence and spread and our responses to them.

Keywords: Influenza, epidemic, pandemic, Greece, history of medicine.

■ INTRODUCTION

The influenza pandemic of 1889 is the first flu outbreak that can be demonstrated to have been worldwide in scope. It followed significant socio-economic changes of the mid-19th century in Europe and parts of North America and was much better documented than any of its predecessors [1]. It should be noted, though, that at the end of the 19th century influenza was still a *Protean* disease, not well understood, and while the epidemic was generally called influenza, neither public health professionals relying on epidemio-

logical knowledge nor medical practitioners relying on clinical knowledge were in agreement on its actual cause or nature [2]. While people were familiar with cases of diseases affecting vast areas of the planet, what caused the actual spread of an epidemic remained unclear, and suggestions were as broad as air pressure and ozone levels to earthquakes and electrical magnetic waves [2]. Of course, in many ways, pandemics are always the result of an emergent infectious agent which is not necessarily fully understood at the time of emergence [3]. This has been the case more recently with COVID-19. Hence, there is a lot of value in studying the social history of a pandemic in order to understand the complex political, cultural and other factors that shape how societies, governments and people respond to those health crises [4, 5].

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■ BACKGROUND

In early October 1889, a wave of influenza began spreading from some of the central Asian regions of the then-Russian Empire, in modern Kyrgyzstan and Kazakhstan. It raced to the west, where people infected by it travelled easily by rail and river, and at the end of October, it reached the cities of Moscow and St Petersburg. The initial emergence in that area lent the pandemic the unfortunate “Russian flu” name; time and time again such denominations have been shown to be non-scientific and discriminatory [6]. From these centres, rail links quickly spread the pandemic to other big European capitals – Paris, Vienna, and Berlin were all infected by mid-November – and those places, in turn, became centres from which the disease moved further by rail passengers. Almost all of Europe experienced the influenza pandemic by the end of December 1889. Traffic in the Mediterranean carried influenza across to Alexandria and Cairo. By mid-December, steamship traffic had also brought influenza across the Atlantic, with the northeastern United States recording their first cases. In January, cities as diverse as Buenos Aires, Tunis, Tokyo, Cape Town, San Francisco and New Orleans reported influenza cases; by March, Algiers, Dakar, Singapore, Bombay and Hong Kong [2, 7].

This spread should not be surprising. Pandemics have always followed patterns of spread consistent with the pathways and speed of human travel. This influenza pandemic especially illustrated in a dramatic way the role of big rail networks and steamships in the diffusion of the disease [7]. Recent, at the time, developments in transportation and growing long-distance trade across imperialist links allowed influenza to move from city to city and into the countryside at unprecedented speed levels. It was the first pandemic to occur in a highly interconnected world: at that time, the 19 largest European countries had over 200,000 km of railroads while transatlantic travel by boat took less than a week [8].

Microbiologically, the most likely scenario is that a novel type of an H3N2 virus was active at the turn of the century and caused a pandemic that probably was not identifiable from morbidity and mortality reports alone [1]. Other research has maintained that an H3N8 virus caused the pandemic [8]. Influenza affected millions and caused

widespread illness and temporary disruption, but individuals had little reason to fear death. However, rather quietly the disease killed old people by the thousands [1]. This pandemic was characterised by high morbidity, and low mortality, which is similar to all 18th and 19th century major influenza epidemics [1], and, in fact, COVID-19 [9].

This pandemic is often studied along with its successive waves between 1890 and 1892 and the associated increased influenza activity during the 1890s decade which remained at a high level in many countries for several years following the passing of the 1889 outbreak. Later epidemics have been described as *waves* of the initial pandemic, even though the term may be misleading as it implies a regular geographical progression. These recurrences had a multifocal nature, and diffusion was slow and local. Distribution was spotty, there was no “front” advancing from a common focus, epidemics developed more slowly and seemed to linger longer in any given place, and diffusion down the urban hierarchy was no longer the rule [1]. Of note, the behaviour of this pandemic in term of this spread and mortality resembles 20th century pandemics, and indeed the COVID-19 pandemic, far more closely than it does those of earlier times [10].

The spread of this influenza pandemic coincided with a volatile period, in both political and socio-economic terms, for Greece. Greek historians have largely ignored this outbreak in a national setting and, for that era, have almost exclusively focused on the economic crisis and the social circumstances of the country. Thus, whereas there is an abundance of secondary sources to support a case for the socioeconomic history of late 19th century Greece, it is a challenging task to present a local epidemiological history for the 1889-1892 influenza pandemic in Greece and, furthermore, to associate patterns of its spread with the external determinants of disease and public health. Secondary sources on the 1889 influenza pandemic, in general, are scarce in Greece. This is not surprising as the country lacked systematic scientific outputs and publications at the time; and given that it was an extremely unsettling era in political, economic and social terms, newspapers and magazines rarely contained comprehensive medical reports. Thus, in order to provide a complete history of pandemic in a national context, the existing “SPEECH” framework was used, which

draws contextual information from a diverse set of areas, including social, political, economic, epidemiological, healthcare, and public health factors [11].

■ SOCIETY & POLITICS

Since his first involvement in the country's social life, Charilaos Trikoupis (1832-1896), the Greek politician whose presence defined the end of the century, set as his primary objective the development of the country for it to be considered equal to the European states. His agenda focused on the modernisation of the political institution with political stability being central to the country's economic and intellectual development [12]. He followed an ambitious infrastructure development programme through major public works, civil service and military reforms, and attracted international investments while maintaining the existing public health policies.

Trikoupis considered monarchy, and its resistance to change, to be an obstacle to the design of large-scale works and a factor in causing social unrest [13]. In his historic 1874 article, titled "*Who is to blame?*", Trikoupis clearly defined his position, explained his ideas for the political system, asked for electoral processes free of fraud and for the restriction of the King's powers [14]. This article caused social turbulence and an abrupt political climate reversal which led to the institutional definition of the majority's declared confidence [13].

In March 1882, Trikoupis secured a comfortable parliamentary majority and became Prime Minister. Having achieved this, he was able to put together his long-awaited development programme which included: the design of measures for the creation of a genuinely integrated internal market, and the securing of foreign funds in the form of loans to support major public works. To this end, ambitious infrastructure works were undertaken under his incumbency, most notably the digging of the Corinth Canal and the construction of a network of roads and railways – both of which significantly strengthened internal mobility and communication – and the initiation of the drainage of Lake Copais that eventually resulted in more fertile surrounding areas [12,13].

Indeed, from the mid-1880s, economic activity was intensified as a result of these changes. The population grew very rapidly (from 1,457,894

in 1870 to 2,433,806 in 1896) [15]. Much of this growth was due to immigration from other Greek-speaking regions and territorial expansion. While Trikoupis' suggestions triggered extremely positive results, political antagonism, corruption and debt mismanagement proved real barriers to change and contributed to a seemingly inevitable economic recession.

■ ECONOMY

Despite these major public works, the overall picture of the Greek economy in the late 19th century was one of slow motion and, almost, backwardness. Greece did not efficiently exploit its agricultural resources, nor did it resolve land ownership and tenure relationships; it did not tap into its mineral wealth quickly, with sea wealth, fisheries and handicrafts also remaining insufficiently exploited [16]. Instead, the country relied on the inflow of foreign lent money; all in all, between 1879 and 1893, almost 750 million gold francs were lent to the Greek government by foreign countries [16].

National historians tend to call the 1893-1896 period Greece's *Great Depression*. They have identified that global changes impacted profoundly on almost every aspect of the Greek economy, including agricultural and rural production, shipping and industry [17]. The international recession led to a decrease in wholesale prices for imported goods. As a result, Greek exports were adversely affected by the exchange prices. After Thessaly was ceded to Greece by the Ottomans in 1881, its vast fertile plain appeared as a substantial promise for a boost to the national economy. Instead, the Greek economy saw the sharp fall in demand for currants, the country's main agricultural export that made up as much as 50-75% of the total value of the country's exports. Currants' prices eventually dropped in the 1890s by 70%, and the value of exports decreased dramatically in comparison to the value of imports [18].

External loans, though signed under unfavourable terms, comprised a fundamental source of income for the local aristocracy and the Greeks that lived abroad. Trikoupis' government was reluctant to raise the taxes that would discomfort the upper classes in the hope that they would invest in the country, although by 1884, almost 40% of the country's income was going towards the pub-

lic debt and taxation had significantly increased [19]. Compared to the first loans of the 1870s, the actual per capita surcharge increased five-fold by the end of the 1880s [17].

In October 1893, protests on the economy and regarding this *currants crisis* took place in multiple Greek cities. Trikoupis assumed duties anew as Prime Minister, but under the growing pressure from national companies going bankrupt, he realised that Greece was unable to stand up to its financial responsibilities. He declared a sovereign default in December 1893 [13].

The 1893 default was an actual consequence of the obstacles that the Greek economy faced and could not be addressed adequately with the ideological and social agenda of Trikoupis' policy. Even right before the end, he sustained that economy had not yet reached a dead end, it could be reversed by receiving the boost from the development works and the his liberal progressive approach. The situation was further aggravated by the terms that lenders had imposed [12, 17], and corruption and misuse of public office for private gain [20].

Trikoupis' economic agenda was swarming with apparent contradictions. He wished for industrial development, but was focusing almost exclusively on agriculture; he was promising to lay the foundation of a modern urban state, but his taxation schemes hit the urban middle classes more than others. He kept protecting the agricultural sector, but signed favourable terms for Thessaly's big landowners [17]. Not unexpectedly, mid and lower social classes were the ones that reacted more strongly to the potential of national bankruptcy [19].

The economic distress of large population masses (especially in connection to the *currants crisis*) contributed to the creation of social turbulence, leading to rallies, mass protests, clashes with the police and the creation of the first socialist and anarchist groups in Greece [21].

■ EPIDEMIOLOGY

The rapid progress of the influenza outbreak across Europe and then to the United States and Asia gave this pandemic a global impact, and it reached Greece in this socioeconomic context. Even though the worldwide telegraph network was well established by the 1890s [22], and Greece already had network connections with other

countries in place, reports on the emerging pandemic rarely made news in the local newspapers. For example, the popular satirical magazine *Skrip* reported high levels of influenza and pneumonia and practically inexistent public health measures in early 1893 [23].

The pandemic started its spread from areas of Russia in October 1889, and it had reached big major inland European city centres by mid-November. Istanbul was affected on around December 10th through ships from the Black Sea ports of Russia and trains from Vienna. The first cases there were among dockworkers. The Ottoman capital seems to have been, in turn, the major starting diffusion centre for the eastern Mediterranean, including Athens. References in the primary literature place the first presence of the outbreak in the Greek capital in the last third of December 1889 [24, 25].

On January 1, 1890, the Athenian satirical magazine *Asty* devoted an exclusive article to the newly emerged pandemic, entitled *Days of Influenza* («Ημέραι Ιμφλουέντζας»): “We have written about it, we have praised it, we have wished for it, and finally it has arrived. Needless to say, we are talking about Influenza. It has first visited all the European countries, and now it has entered ours. This has to be positive because it comes to show that Greece is a part of the European family too - as the serious newspapers keep reminding us - and it could not be an exception to this rule”. The article also commented on the severity of the outbreak: “But there is something both strange and positive; influenza in our city is not as severe and dangerous as elsewhere but is benign” [26].

The island of Corfu was hit by the pandemic almost simultaneously with Athens, between 21 and 31 December. It spread there either through Athens – as the Ionian Islands were ceded to Greece in 1864 as a gift from the European Powers with George I's enthronement, resulting in another rise in their national trading exchange routes – or through Italy, that had kept its trade relations with Corfu and experienced the first wave of the pandemic around the same time.

What we can most probably be sure of, is the spread of the disease to Thessaloniki from Athens. Even though Thessaloniki was still under Ottoman occupation at the time, it maintained trade routes with Athens, and it did not connect to Istanbul via rail until after 1895 [27, 25]. No records of the disease in the Greek province exist; however,

we could reasonably expect that influenza activity must have been high. In general, the first wave of the pandemic in 1889, as recorded by contemporary observers, saw a pattern of transmission from large cities to smaller ones before eventually arriving in rural towns and villages [1]. There is no available evidence that the second wave of the pandemic caused significant morbidity in Greece, while the third wave, it seems, reached Athens in January 1892 once again from Istanbul.

The 1889–1890 influenza was a severe public health threat across the world. The four waves of the pandemic caused extensive morbidity, with probably one-third of the adult population experiencing at least one bout in the countries that were strongly affected. Deaths from the virus itself were relatively infrequent, although the associated rise in mortality from pneumonia, bronchitis, and circulatory disease raised the overall death rate [22]. The fatality rate was low, but high case loads resulted in excess mortality [28].

Interestingly, influenza activity remained at high levels for many years following the pandemic. In this context, Greece kept recording high levels of influenza activity through the whole 1890s decade. Even though accurate statistical numbers do not exist, the country recorded high disease rates up until the next wave of a different virus at the turn of the century. Crude mortality rates have been calculated for influenza in 1899 and 1900, given the number of deaths and the data from the 1896 census [15]. Athens recorded a crude mortality rate of 0.33 for influenza in 1899, but 0.76 in the first six months of 1900 [29, 30]. These numbers, though raw data, are considerably high.

The mild nature of the 1899-1901 flu could have been due to residual immunities among the older people who had survived the 1889-1890 pandemic; probably only the H antigen was new [1]. Thus, we can assume that Athens had indeed faced significant morbidity and mortality rates in the first waves of the 1889 pandemic.

■ CULTURE

After 1889, medical practitioners were not merely mapping new behaviours of an old disease, but those of a new influenza. In the emerging medical press, it was not clear whether this new influenza pandemic was to be attributed to a microorgan-

ism and whether the stunning diffusion of influenza was the product of microbes being carried in the air, microbes spreading from one person to another, or a combination of the two [31].

This uncertainty of the cause of influenza left plenty of room for speculation, and the late 19th century European print media was the place to express it. This contributed to a collective attitude, present throughout the pandemic, that the media had not only exaggerated the disease but were also responsible for spreading it [22]. Cultural references to influenza in the press did not wane throughout the whole decade. In the mid-1890s, tales of Victorian professionals experiencing psychiatric and psychotic problems due to the nervous system complications of influenza were commonplace in the British medical journals [32].

In the same context, a few interesting literary or satirical references can be found in Greek newspapers and magazines in the 1890s. Given the unstable socio-political conditions, this era favoured the emergence of satirical magazines and columns. In 1893, an issue of the *Literary Echo* (*Φιλολογική Ηχώ*), a magazine of literature and arts, featured a poem by Alexandros Perdikidis titled *The Sneeze*. This is the only poem with a theme vaguely relevant to the influenza pandemic out of thirty-two 19th century magazines that have been digitised by the University of Patras [33], and was published during the final remission of the pandemic [34]. The poet offered a satirical description of influenza-like symptoms:

*When someone sneezes, they tell him: she thinks of you!
And his mind secretly wanders
And starts dreaming...
He dreams of his love hiding in his arms
And his heart rejoices
And... and sneezes once again.
But when I sneeze like everyone else
I feel like devils get into my head
And my breath is lost...
Oh my heart gets into weird dreams
Because I know that only one remembers me indeed,
Who else – but catarrh!¹*

In another poem by George Avdiridis published in 1894 in the satirical newspaper *Skrip*, the recent pandemic was placed in a social context [35]:

[...]

1. Translated by Antonis Kousoulis.

*The Parthenon has not fallen
but it will soon start pleading the German
to finally leave it alone...
The Parliament is in session
loudly discussing the deductions
that have innumerable pros and a thousand cons.
But the public is hungrier than ever
and the wretch will have to eat poorly!
We've had a lot of pandemics this month
but now hunger is worse than gastric typhus.²*

Apart from the satirical poems, anecdotes and short stories on influenza were published in satirical Athenian magazines. In the 1890 New Year's issue of the satirical magazine *Asty*, a few of these anecdotes were collected [26]:

Two things toured Europe this year: Influenza and the Emperor of Germany.

A discussion in the street: "Greengrocer, do you have cauliflowers:", "I have cauliflowers, cabbages, celeries, parsley, potatoes", "What else do you have?", "I have influenza!"

Interestingly, the 1889 pandemic also seems to have triggered a whole new scientific and public nomenclature around influenza in Greece. The Greek term for influenza («γρίπη») is derived from the French *grippe* that comes from the verb *gripper*, originating in the late 18th century and meaning to 'seize suddenly'. In Greek, a new term that can be best translated as influenza-like («γριπώδης») appeared for the first time in 1889 among the pages of the French-Greek scientific magazine *Asklepios* [36, 37]. Apart from this, some new terms deriving from the Italian or English *influenza* appeared in Greek publications for the first time around the years of the pandemic [37]:

- «ιμφλουεντιώδης» [*influenziodes*], that is relevant to influenza, first recorded on January 25, 1894;
- «ιμφλουεντσιών» [*influenzeon*], that suffers from influenza, first recorded on February 11, 1892;
- «ιμφλουεντσιασμένοι» [*influenziasmenei*], those who suffer from influenza, first recorded on January 25, 1894;
- «ιμφλουεντισοπαραγωγός» [*influenzoparagogos*], that causes or leads to influenza (usually: the weather), first recorded on January 25, 1894;
- «ιμφλουεντισοπαθείς» [*influenzopathes*]; those who tend to suffer from influenza, first recorded on March 24, 1895;

2. Translated by Antonis Kousoulis.

- «ιμφλουεντιοφόρος» [*influenzophoros*], that brings influenza (usually: the North), first recorded on February 29, 1896.

All of the above words that do not correspond to equivalent English terms appeared briefly in Greek publications and have not survived in the modern Greek language. However, they interestingly draw the cultural implications of the pandemic in that era. Generally speaking, such neologisms emerge as tools to help people cope with changes in their lifestyles [38]. Hence, it is argued that the adoption of new words must have come as a result of the need to talk about a new social impact and these Greek terms add to the literature of the 19th century *germ talk* [39].

■ HEALTHCARE & PUBLIC HEALTH

This pandemic occurred following the fourth stage of the development of public health as a field or state agenda when the new research direction of epidemiology furthered the development of governmental responses to disease outbreaks [40]. Starting in the mid-1800s, several countries saw a big transition of public health from social agitation to professional civil service. Public health regulations seemed at times quite advanced, but their administration was seldom effective as centralised health administration in Europe only developed in the early 20th century [40]. The study of infectious diseases was in fact what mostly triggered the development of public health, in the first instance through the debate between contagionism and anticontagionism [41]. Despite the clear scientific records on the pandemic in medical journals, notably the *British Medical Journal*, more than for any other previous epidemic, some issues concerning the nature of the disease remained open to debate. Contagion, infection and causality were themes that had not been resolved [42] and would continue to be explored by new "medical geographers and disease detectives" [43]. The pandemic emerged in this confused medical establishment and, while substantially milder than the previous mid-century outbreaks, it travelled at a surprising pace. To those surveying how the world had changed, this was interpreted as the price to pay for modern systems of communication and transport. As contemporaries observed, influenza was not a grave threat to the body of the individual but, by strik-

ing a large number of people at once it was a direct threat to the social body [22].

This influenza pandemic had another interesting social aspect. Parts of Europe and North America had experienced significant socio-economic developments since the mid-century. Industrialization, urbanization, and job specialization had reached much higher levels in Western Europe and were spreading rapidly to other parts of the world [1]. People at that time would have recognized for the first time the cost a major outbreak can have regarding the loss of working hours and its impact on the workforce with the economy disrupted due to labour shortage [28]. These themes have been extremely relevant more recently in the context of the COVID-19 pandemic [44].

It is unclear whether economic influences affected the less industrialized nations in the same way. In any case, however, similar social implications were a reality in Greece. It seems that the local politicians' agenda on public health followed some of the above directions. With Greek society torn under the influence of the economic crisis along the lines of deprivation, income, and class, it appeared as though the poor would be more vulnerable to the spread of a novel disease. However, despite the pandemic being a threat to society as a whole, only limited funds could be allocated to fighting the new health threat effectively, and public briefings, as well as media coverage, were by no means universal or systematic. As in other countries, given the lack of a consistent medical body to feed their stories, newspapers used non-scientific descriptions and speculations for their pieces [45]. In Greece, given the political instability of the country, reports on influenza were often not of enough priority compared to political and economic articles. For example, in an 1892 article published in the literary and social magazine *Estia*, entitled *The influenza microbe*, a reference was made to the work of bacteriologists Pfeiffer, Koch, Kitasato, the dangerous spread of the epidemic and its clinical characteristics [46]. Despite the article being published under the column 'Health and Hygiene', no details on preventative or therapeutic measures were listed. Such examples might perhaps be found among the pages of contemporary Greek magazines and newspapers, but the evidence is scarce.

Of note, an early response to the disease in Europe was to turn to history in an attempt to extrapolate

meaningful lessons from the past. British journals, for example, gave considerable historical detail on influenza, tracing its etymology and recording its long history. It was this background that gave an initial context for that current outbreak [22, 42]. In this context, the Greeks themselves - lacking any recent national data, except some references to cholera - turned to their much familiar Hippocrates. A characteristic example of this - not unusual in Greece - turning back to antiquity occurred in May 1891 when a scientific soirée was held at the University of Athens, during which the newly published book *On Hippocratic epidemic influenza* was discussed [47].

Regarding formal public health measures, the early 1890s nations, like Greece, that had remained committed to the quarantinist approaches, were slowly being persuaded that disinfection and surveillance could replace old-fashioned precautions [48]. The mode of disease transmission though was still debated. In Greece, the population resisted any change as it had attributed its exemption from the cholera epidemic of 1855 to strict enforcement of quarantine, and, hence, as late as 1903, the authorities maintained that they could not dispense with quarantine against the plague because of public opinion [48].

While countries like Britain took a more evidence-based approach, commissioning a special inquiry in 1892 into the clinical characters and the pathological nature of influenza, aiming to explore *more authentic methods* of earlier identification of influenza cases [49], Greece did not make any attempt to improve its scientific methods to strengthen its safeguards against the disease. Countries like Greece where commerce, industry and travel were not as predominantly crucial as elsewhere, did not look further to design or implement new changes as they found quarantinism less damaging [48]. These remained substantial barriers to change. The country largely denied the theory of contagion, arguing that it would lead to a complacent approach to epidemic disease which was not prudent. Cholera had struck only once (in 1854 when quarantines had not been fully implemented, and the capital of Athens and Piraeus were occupied by French and British troops), and hence the faith in quarantinism remained strong [48].

At the 1893 Dresden Conference, along with Denmark, Portugal and the Ottoman Empire, Greece abstained from condemning overland and mari-

time quarantines. Greece, having little in common with the other countries other than similarly aqueous geography, followed protective suit. It was not just a matter of proximity to the sources of contagion, but also of the topographical ability to implement quarantinistic precautions. When the revision system had been discussed earlier as a replacement for quarantines in 1874, the Greeks had voted for the old system, convinced that in their circumstances - sparsely populated and surrounded by water - it would be effective [48].

In monetary terms, we might argue that quarantines (similar to our modern lockdowns) were not cheap. The sums involved, however, pale in comparison to the massive infrastructural investment required to enhance the hygienic standards of those comparable with the cities of 19th century Europe. The costs of quarantine – short-term and topically applied to solve urgent and immediate problems – were also politically easier to justify than the slow, patient, expensive and large-scale increments of sanitary reform. Moreover, although even maritime quarantines required considerable human resources in the form of soldiers, sentries, and inspectors, the bureaucratic requirements of the neo-quarantinist inspection systems were potentially more significant. Thus, quarantinism was not only a strategy that appealed to countries in certain geo-epidemiological positions, but it was also the impoverished country's tactic of choice. The Greeks and the Ottomans, for example, agreed that quarantinism held out the best hopes of epidemiological security for impoverished nations. Their cities were in substandard hygienic conditions, impeding hopes of extinguishing disease once it had penetrated, and their public health administrations were not prepared to keep all travellers under surveillance, as demanded by the revision system. Quarantines were, therefore, the best, most cost-effective and publicly acceptable solution [48].

■ CONCLUDING THOUGHTS

The resource-limited environment in which Greece was operating during the spread of the 1889-1892 influenza pandemic may have had a significant impact on the spread of the epidemic in the country. In most of Europe, and in a few other places, governments had created participating agencies to monitor and improve health

conditions. Census taking and compilation of vital statistics was considered an essential activity for modern governments [1]. Despite the fact that Greece could learn a great deal of information on influenza from the other countries' experience – indeed, only census taking is noted among the measures that can be considered as assistive to epidemiology [15] – or could build upon tested health policy measures, its reaction to the pandemic was rather reactive and almost primitive, and, further, done under stress driven by financial incentives and perceptions of an uneducated public.

This disconnection in the sharing of global health evidence and the lack of a true health security approach focus has not, of course, been a unique feature of Greece and is a scenario that played strongly during the COVID-19 pandemic [50]. In fact, despite being separated by 130 years, the 1889-90 influenza pandemic and the COVID-19 pandemic share some striking similarities:

- Despite having clear scientific terminology, many referred to the outbreaks using discriminatory geography-derived terms (e.g. Russian Flu, Chinese virus).
- Both pandemics spread globally across clear lines of international transport connections (predominantly through railroads in 1889 and air routes in 2019).
- Both pandemic diseases had a low case fatality rate, but led to excess mortality because of the great number of cases.
- Those older and those living in most deprived areas were most vulnerable to the two pandemic diseases.
- Subsequent waves of both pandemics (following the initial emergence and spread) were spotty and multifocal, lingering longer in certain places than in others.
- Both pandemics were seen as major threats to the labour economy.
- Culturally, both pandemics led to the development of a diverse number of neologisms in different languages, related both to the disease and broader relevant issues.
- Both pandemics were, at the time, seen as a price paid for rapid, unsustainable social and economic growth.
- Public health debates were rife in both periods, especially in relation to arguing for or against quarantine and lockdown measures.

The 21st century has been dubbed the “century of pandemics” and has so far delivering on that dreadful promise [51]. As we move forward, it is essential that we are able to reflect on such shared trends over decades, which are true because of common and interactive co-determinants of infectious disease outbreak emergence and spread and our responses to them [11]. In order to avoid another reactive and surprised response to the next pandemic (or indeed future waves of COVID-19) a consistent and shared awareness of the interconnectivity of complex social, economic, political and demographic factors, and their role in disease outbreaks, spread and response, is necessary.

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