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INFLUENZA

INFLUENZA (flu, grippe), a common contagious infection of the upper-respiratory system caused by the Orthomyxovirus class of viruses. Members of the Orthomyxovirus family that infect humans include the Influenza-A Viruses (isolated in 1933), the Influenza-B Viruses (isolated in 1940), and the unusual Influenza-C (isolated in 1946), which predominantly infect lower animals. The first flu virus was isolated in 1931 from the snouts of pigs, a discovery that led to the coining of the disease as "swine flu." Although this affliction, usually characterized by a severe cold, is ubiquitous to mankind's experience with illness, it is nevertheless lethal to the extent that it can lead to acute complications such as pneumonia (i.e., bacterial infections by Streptococcus Pneumoniae and Hemophilus Influenzae), cardiac involvement (myositis), and neurological syndromes (i.e., Guillian-Barré Syndrome, encephalopathy, encephalitis, and Reye's Syndrome). Clinical features of influenza include exposure to and transmission via inhalation followed by an incubation period of one to four days. These viruses replicate in the epithelium of the upper respiratory tract and are most commonly associated with symptoms of abrupt fever, severe myalgia, and unproductive cough.

The Orthomyxoviruses are enveloped viruses with helical symmetry that replicate in an infected host's cell nuclei. These viruses contain eight single-stranded RNAs (ribonucleic acid) with negative polarity coding for ten genes, each of which specifies a unique aspect of the influenza viruses' morphology. The two most important antigens coded for by these genes are hemagglutinin (HA), which is the attachment protein for the viruses, and neuraminidase (NA),

which acts as the releasing enzyme for influenza. It is this segmented and unstable genetic makeup that has allowed the influenza viruses to possess a remarkable ability to mutate. This endowment, besides bringing forth varying levels of virulence, has also made it difficult for the human body to mount an effective immune defense. The two types of genetic mutations witnessed in the influenza viruses are genetic drifts and genetic shifts. Genetic drifts are point mutations within the genes coding for HA or NA, which are continuously occurring (2-3 years) with minor antigenic consequences. Genetic shift, on the other hand, defines a re-assortment of RNA segments between dissimilar influenza viruses with major epidemiological consequences (occurring in roughly 10-year cycles). It is these genetic shifts that have been responsible for the recurrent bouts of deadly influenza pandemics throughout history. The 20th century has witnessed nine major antigenic shifts including two major shifts between 1918 and 1919 [H3N2/H1N1], which led to the single deadliest pandemic in the annals of mankind.

It is estimated that there have been seventeen global outbreaks of influenza between 1175 and 1920. However, given the dearth of precise historical documentation of the symptoms associated with influenza, there is every reason to believe that pandemic outbreaks of the flu predate the 12th century (McNeill, p. 329). Ebn-al-Aṯir mentions a virulent epidemic resembling influenza that started in Central Asia (*belād al-tork*) in 241/855-856 and spread across Persia from Saraḵs to Ḥovān, killing a large number of people (Ebn al-Aṯir, Beirut, VII, p. 80). Notwithstanding the similarities of the illness to influenza, the lack of detail in Ebn-al-Aṯir's descriptions limits the identification of this early outbreak to the realm of conjecture (Tholozan, p. 262).

In Persia, the first established evidence of influenza's visitation dates back to the summer of 1833, when it erupted with great virulence in Tehran. The epidemic, thought to have arrived there via trade routes from Syria and Constantinople, was part of a larger global pandemic that had ravaged thousands throughout Asia and Europe. The number of ill people among the British diplomatic corps convinced Sir Robert Campbell, the British minister in Persia, to move down his mission from its summer camp in the foothills of Šamirān to Tehran. Among the capital's citizenry dozens daily succumbed to the ravages of the scourge, and the dead and dying lay about every street corner. Even Fatḥ-ʿAli Shah was not spared; overtaken by the flu, he struggled with severe fever and chills that lasted several days. The shah's condition

fueled rumors that the incompetent management of his illness by the royal physicians had led to the monarch's worsening state of health. It was generally believed that Fatḥ-ʿAli Shah's death was imminent; however, after several days of torment the shah recovered (Elgood, p. 466).

Although there can be no doubt that influenza had plagued Persia on numerous occasions prior to the 19th-century, its earlier visitations remain hidden in the annals of history. The lacuna was primarily due to the lack of a specific etiological designation for influenza in the Persian lexicon. In fact, Persian physicians classified influenza under the general rubric of *wabā*, a term used to designate all virulent contagious diseases other than bubonic plague (*ṭāʿun*) and smallpox (*ābela*). In 1874, Johanne L. Schlimmer, a Dutchman and professor of medicine at the Dār al-Fonun (q.v.), designated influenza in his book as *nazla-ye wabāʾi-e qaṣabat-al-ria* (Schlimmer, p. 306).

The year 1889 marked a renewed pandemic of influenza. Beginning in Siberia and spreading westward through Russia, influenza eventually overtook the whole of Western Europe, and by September of that year reached Persia by way of the northern city of Rašt (Tholozan, p. 261). Before long, cases of the flu broke out in Tabriz, and by the end of November the citizenry of Tehran were once again in the grips of the dreaded illness. On 14 March 1890 the epidemic reached the southern port-city of Bušehr, and at least one-half of Persia's population had contracted the disease (Tholozan, p. 251). Persian physicians who encountered influenza for the most part initially diagnosed the illness as a common-cold distemper and as a result were caught off guard in the face of mounting fatalities (*Aḵtar*, 3 March 1890, p. 221). Even younger physicians who were trained in Western methods of prognosis were surprised at the suddenness, gravity, and quick diffusion of the disease (Tholozan, p. 251). In Tehran alone, fatalities due to complications arising from influenza numbered between fifty and seventy daily, and even the notable among the population were not spared (*Aḵtar*, 3 March 1890). On 20 Jomādā 1309/20 January 1890, Nāṣer-al-Din Shah's minister, Yaḥyā Khan Mošir-al-Dawla, succumbed to a pneumonic complication which arose from the visitation (Eʿtemād-al-Salṭana, pp. 789–90; FO 60/532). Other notable deaths due to influenza included the minister of the army, Mirzā Kāẓem Khan Neẓām-al-Molk (*Aḵtar*, 3 March 1890). The outbreak was especially severe among the young, and over six thousand children passed away as a result of associated illnesses such as severe throat ailments and measles (*Aḵtar*, 10 February, p. 199). Ignorant in the face of this lethal and highly contagious epidemic, Persian physicians

could only sanction the populace to keep their homes warm and to avoid the cold air. In addition, the consumption of purgatives was recommended as a means of depleting the body of its various "poisons." Finally, as a last resort for lowering fevers and chills, Persian physicians prescribed quinine and camphor (*Aḵtar*, 10 February, p. 199).

The outbreak of the flu in 1889 had several unforeseen developments. On the one hand, detractors of the Persian government used the high mortality, brought about by the visitation, as justification for their call in favor of a more effective sanitary body in Persia (*Aḵtar*, 10 February 1890). Concurrently, Persian physicians came under fire by these very same critics, who accused medical men of playing a role in the high mortality by misdiagnosing influenza as the common cold and not treating it aggressively enough. Another outgrowth of this visitation was that the term *ānfluānja*, borrowed from Europe, came to replace the earlier appellative, *wabā*, as the designation for this contagious illness. The 1889 epidemic also played an important role in the propagation of the germ theory of disease causation among the literate Persian population. Ironically, this development was facilitated by the strange and lethal nature of the influenza epidemic, which enhanced public interest in the microorganisms and microbes that were singled out as being responsible for the global scourge (*Aḵtar*, 24 February 1890).

The influenza epidemic, which had broken out in 1889, lasted through the spring of 1890 in Persia; with the advent of summer, the disease began its gradual march towards extinction. Influenza's departure was, however, temporary, and in 1918 a renewed visitation of the flu returned to Persia with greater fury, making it the most lethal and widespread pandemic in Persia's history.

This influenza epidemic invaded Persia from several different directions, probably by virtue of the several armies fighting within its territory and on account of its geographical centrality within the Eurasian plateau. One of the earliest points of entry for the flu was via the Russian city of Ashkhabad (q.v.). Ironically, the Russian troops who carried the illness to Ashkhabad had themselves contracted the disease from the American expeditionary force, which had landed infected troops in October at the Baltic port of Archangel (Crosby, pp. 145-46). Having contracted the disease from the Americans, the Tsarist troops, in retreat from the Bolshevik onslaught, unwittingly transmitted the disease southwards along their retreating lines through Central Asia into Persia.

Accordingly, from Ashkhabad, the flu reached the northeastern Persian city of Mašhad by the third week of August. Mašhad, a pilgrimage center on the supply route for the White Russian and the British armies, served as an important junction for the dissemination of the disease throughout the country, not only due to the ubiquitous presence of soldiers, but also on account of the ever-present crowds of pilgrims from all parts of the Shiʿite world. Thus, from Mašhad, the disease spread southwards, overtaking the city of Birjand by the fourth week of August. By the second week of September the whole of the eastern Persian provinces of Khorasan and Sistān were overrun by influenza, and in the following month the more central provincial capital of Yazd succumbed to the flu as well. The disease also followed westward Mašhad-Tehran highway, infecting villages and towns along that road. The first wave of influenza also invaded Persia via the Caucasian city of Baku, where it overtook the Caspian port town of Anzali (q.v.) by the fourth week of August 1918 (FO 371/3892, no. 257; Afkhami, pp. 373-77).

As in the rest of the world, the speed of modern transportation was a key factor in the rapid propagation of the “Spanish” Flu, as the 1918 pandemic came to be known, into Persia. In fact, to reach the seaport of Anzali, the epidemic had followed Caspian steamship routes from Baku; and the Tiflis-Julfa railway, which rapidly carried the outbreak through the otherwise difficult terrain of the Caucasian highlands, facilitated the flu’s transmission to Tabriz (FO 371/3892).

The Persian Gulf ports of Bandar-e ʿAbbās and Bušehr (qq.v.) were other points of entry for the first wave of the epidemic into Persia. The carriers of the infection into these ports were British and Indian troops who had embarked at Bombay as part of the British expeditionary force into the Middle East. The outbreak in Bandar-e ʿAbbās was mild, but it took over three months to extinguish. Following its initial outbreak in Bušehr, the flu spread to Shiraz by the third week of October. By the end of that month, the epidemic had reached Saʿidābād, and on the 17th of November cases of the illness surfaced in Kermān (FO 371/3892).

The final route of the Spanish flu’s first wave into Persia was via its Mesopotamian frontier, where the British troops were making significant headway against the Ottomans. Kermānšāh was attacked on the fourth week of August, followed by Hamadān on the second week of September. By 15 September, the disease was transmitted to Qazvin, by all accounts brought by troops arriving from Hamadān. From Qazvin, the disease spread rapidly along

the motorcar routes northwards, appearing at the Caspian city of Rašt a few days after it had broken out in Qazvin. Because Tehran was off the main military traffic line moving north, it was overtaken by influenza on the relatively late date of 22 September 1918. The infection was brought into the capital city by travelers from Qazvin (FO 371/3892).

The Spanish Flu broke out in Tehran unexpectedly, a shock that coincided with the emergence of a strong western wind on 24 September, fueling the popularly held belief that the outbreak was caused by “corrupt winds.” So strongly was this belief held that influenza at this time became known as the illness of the wind (*nāḵoši-e bād*). Following the outbreak of this first wave of Spanish Flu in Tehran, the epidemic spread down the country’s southern arteries, reaching the central city of Isfahan by the third week of October and from there spreading farther south to Yazd (FO 371/3892).

The second, more virulent form of influenza followed in the heels of its precursor, moving across the Baghdad-Kermānšāh road once again and catching up with Tehran by the end of September. On its northbound trek from Mesopotamia, this new surge of the Spanish Flu was especially virulent in the cities of Kermānšāh and Hamadān. The flu’s impact on the inhabitants of those cities was especially acute, due to the immense number of Armenian and Assyrian Christian refugees who had escaped Turkish persecution in the Caucasus, following the retreat of British troops from Baku. During the last two weeks of September, Kermānšāh alone had received 60,000 hungry and diseased refugees, a number equal to the native population of the city (FO 371/3892). Under these conditions, the inhabitants of Kermānšāh not only had to face an unusual scarcity of food and lodgings, but they also had to grapple with a renewed and much deadlier visitation of the flu.

From the port of Bušehr, the second wave of the Spanish Flu spread to the city of Shiraz, keeping true at all stages to the strength and virulence associated with this wave of the outbreak. The whole of the southern province of Fārs was stuck in a particularly severe manner; and this territory bore the greatest share of casualties among all Persian regions in this period (FO 371/3892). The outbreak spread through Fārs at a time when British forces were engaged in heated combat with the Qašqāʾi tribal confederacy, which had sided against the British presence (Sykes, p. 515). In Shiraz, the flu was extremely severe and the whole province was caught off-guard. As a result, just as in Tehran, the response to the outbreak was wholly disorganized. Moreover, a large number of the basic services were paralyzed, because medical personnel, transport

workers, and telegraph and postal officials succumbed to the epidemic, adding to the difficulties of rendering aid where it was needed (FO 371/3892). Not even the nominal governor of the region, ʿAbd-al-Ḥosayn Mirzā Farmānfarmā (q.v.), was spared from the pains of the visitation. He, along with the rest of the residents of Shiraz, was gripped by the flu and was barely able to recover.

This wave of the epidemic continued its progress up and down the country, passing through the town of Kāzerun. The disease struck such fear among the population of this town that inhabitants took flight (as they had the habit of doing during cholera and plague outbreaks), and it was said that doctors treated their patients with prescriptions handed through barely opened doors. Influenza also reached Saʿidābād at the end of October, and the city of Kermān was struck severely on 17 November. A number of notable Persians figured among the casualties, including Noṣrat-al-Mamālek, who had acted as governor-general of the province from 17 February to 19 July. The districts of Kermān, especially Jiroft, Bam, Narmāšir, Rafsanjān, and Ḵabis, were particularly hit hard by the flu, and by all accounts the mortality in this region ranked as the highest that had occurred in Persian history (Government of India, pp. 24-25). The town of Šuštar in Khuzestan was also attacked severely by the flu in November, where the disease was presumably introduced by the British troops from Baṣra. The epidemic was particularly virulent among the military force residing there (FO 371/3892).

The epidemic continued its northward trek through the province of Sistān and spread throughout the province of Māzandarān, where its outbreak in the Caspian port town of Mašhad-sar was particularly severe (FO 371/3892). By the fall of 1919, the Spanish Flu had run its course in Persia, leaving a trail of death and misery in a country already blighted by war, famine, and other contagious diseases. Since deaths were not registered in Persia at this time and an accurate population census was nonexistent, mortality figures from various sources only roughly indicate the severity of the disease in the towns in question. However, one irrefutable observation about the fatalities during the visitation of influenza is that the disease was much more virulent among the people living in the countryside than among those inhabiting urban areas. Another definite appraisal is that mortality was considerably higher among those with chronic malaria. Furthermore, cases of the flu were much more prevalent among indigenous Persians than among Europeans residing there, and the illness was markedly more lethal among the natives of India, as compared to either Persians or Europeans (FO 371/3892; Hale, p. 237).

Estimates would indicate that Persia potentially lost a population ranging from 902,400 to 2,431,000 inhabitants to the flu. The true number of casualties probably stands somewhere in between the two extremes. These numbers are, however, very significant, for they indicate that Persia's losses were anywhere from 8.0 percent to 21.7 percent of its population; hence it would stand near the top of the 1918-19 influenza pandemic's international mortality ladder (Patterson and Pyle, pp. 14-15; Afkhami, pp. 391-92).

Following the great pandemic of 1918-19, variants of the influenza virus continued their cyclical visitations to Persia throughout the 20th century. However, these epidemics were a far cry from the virulent outbreaks that were observed during the 1889 and 1918 pandemics, and their demographic impact was marginal.

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