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## *The Influenza pandemics of 1918-1919 in Asturian territory: Analysis of a 100-year process going from historical suffering to emerging disease*

This study analyses the 1918-1919 flu pandemic also known as “Spanish Flu”. Flu is a seasonal disease mainly with aerial transmission, short incubation period and a characteristic clinical syndrome. The initial outbreak of the pandemic was detected on March 4, 1918 within an US Army camp and it is considered the greatest mortality crisis in our history killing about one hundred million people around the world.

Flu virus responsible for the pandemic was an RNA virus of the Orthomyxoviridae family, Influenzavirus genus, type A, subtype H1N1 reconstructed years later by Jeffrey K. Taubenberger. The virus prang up in 1957, 1977 and 2005 and in 2008 appeared in Mexico and the USA infecting 12,515 people with 74 dead from 43 countries. It started again in 2011 and motivated the World Health Organization to activate an international action plan to face a possible pandemic. The virus behaviour showed that the very fearsome flu epidemics are unpredictable. The same virus that caused the pandemic of 1918/19 is still active and since we are in a globalized world there is a potential danger of attacking populations born after 1957. Typical reservoirs of Influenza subtypes are waterfowl and wild birds so it is not possible to eradicate them. In addition, once the epidemic is triggered it is almost impossible to stop its progress, but potential damage can be mitigated by carrying out good preventive medicine with vaccinations, especially in developing countries where populations are more susceptible to being infected by living in very large families in chronic poverty with low defences against infectious diseases.

In Spain the first general analysis of the disease was carried out by Echeverri Dávila in 1993 and there are 34 other publications from different places in our country that, in the opinion of the aforementioned author, should continue to unravel issues not yet clarified. Lack of information led the Areas of History of Science (History of Medicine) and Preventive Medicine and Public Health of the Department of Medicine of the University of Oviedo to assess what happened in the Principality of Asturias. On limitation to study this situation is the lack of official data because Mr. Buenaventura Maria Diaz Plaja, Governor of Asturias and President of the Board of Provincial Health at that time, never came to stablish the epidemic situation. This forced us to use existing secondary documents in our Autonomous Community, especially the daily press of the period.

By that time Asturias, with 715,476 inhabitants, as the rest of Spain was a poor province, with few urban centres (Oviedo, 52,000 inhabitants, Gijón, 55,648 and Avilés, 12,900) and a lot of emigration. General environment was unhealthy due to overcrowding, deficiencies in sewage system, lack of sanitary police and poor personal hygiene habits. As an example, Oviedo had a Provincial Hospital with only five doctors, it also had a Relief House, a “Municipal Chemical Laboratory” and a “Bacteriological Laboratory”. The health care in Gijón was carried out in the Hospital de Caridad, an “old-fashioned and small” building in which they set up a Relief House, attended by the Daughters of Charity, a doctor, a surgeon and a practitioner; They also had Municipal Chemical Laboratory. Avilés counted on a

Hospital of Charity, which did the times of House of Help, with three doctors.

Spain was affected by three epidemic periods: the first one in the spring of 1918 (mortality: 0.04-0.65 per thousand inhabitants), the second one in the autumn of the same year (mortality: 0.50-1.4) and the third during the first quarter of 1919 (mortality: 0.07-1.40). In the winter of 1920 there was a fourth less intense outbreak than the previous ones. The total official state deaths were 182,865; however, Echeverri Dávila calculates upwards 270,000, with a mortality rate of 13.03 per thousand inhabitants, equivalent to 1.30% of the population (Europe remained at 1.1%). Most affected age intervals were 20-40 years old, with a maximum peak in the range of 25-30, then those under 12 months and 1-4 years; both sexes affected equality.

Highest number of deaths occurred during the autumn outbreak of 1918 (mortality rate between 4 and 6.99 per thousand inhabitants). The documents we handle attest that the pandemic affected the entire province, causing 4,544 official deaths, but with varying intensity. We divide the territory into three large spaces: a central and more urbanized area with Oviedo, Gijón and Avilés; a rural area, Cangas del Narcea and the rest of the Province.

Statistical Yearbooks show an increased mortality between 1915 and 1920 due to pulmonary tuberculosis, acute bronchitis, chronic bronchitis and pneumonia so we think they were really cases of influenza. Total increase for Asturias in 1918/19 was 7,318 deaths, a figure in line with the suggested by Echeverri Dávila, equivalent to a mortality rate of 10.22 per thousand inhabitants or 1% of the population.

Oviedo, according to the Yearbook of the National Institute of Statistics, had 419 deceased. However, after analysing the daily evolution in the Civil Registry Book, between January 1, 1918 and May 31, 1919, we recorded 640 deaths due to influenza in absolute terms or 922 deaths per 100,000 inhabitants. In Gijón there were 307 and in Avilés there were 120 deaths. Therefore, in this central location we added 1,067 deceased with a mortality rate of 8.84 per thousand inhabitants. For the rest of the Principality the rate was 9.70.

Mortality caused situations of authentic terror expressed impeccably by the journalist Gícara, who affirmed on October 16, 1918 from Oviedo that “more than havoc, what happened is a real catastrophe”, since there was not a single place without invading, especially in the rural area, where “the plague leaves as a reminder of its lugubrious step a wake of mourning, of inconsolable pains, of tears ...”. He also reported that people had

such panic to the disease that nobody left the house and how those affected died due to lack of medical assistance or because they did not find anyone to help them with the fear of contagion. Therefore, “the more they die of hunger, because when the head of the family falls ill, the daily wage is left to attend to material needs”.

Cangas del Narcea, one of the poorest councils of the Province, had some clearly differentiating characteristics: the episode debuted late and stayed longer (almost five months) and reached a rate of higher overall mortality, 30.29; more than twice the Spanish figure and almost three and a half times in relation to the central area of Asturias. We attribute this situation to overcrowding, poor hygiene, low health education and poor access to the doctor; we even know that many patients died in the most absolute abandonment by simple starvation. We appreciate an important female mortality probably due to the fact that in rural women bore the brunt of the burden when the fundamental tasks of family assistance and care for the sick rested on them.

Dissension between the government and the press exposed, apart from the demographic crisis, the existing social inequality and the disastrous hygienic-urbanistic and welfare conditions.

Attempting to stop and cure the disease in the central area was the Provincial Hospital and the hospitals of Gijón and Avilés where groups of patients were admitted but soon they were overwhelmed. A little hospital facility was established in Oviedo and two in Gijón, and an assistance system was deployed based on basic care with home visits, financial or food assistance, placement of the weakest and maintenance of basic foods such as milk and eggs. Food was scarce in Cangas del Narcea because with forced requisition they retained wheat, rye and chestnuts, food more indigestible than milk and eggs. In addition, this isolated council did not have any health facility; situation that encourages us to think that most of the patients were left to their fate.

Medicine at that time under the bacteriological paradigm thought the disease was caused by Pfeiffer's bacillus. Some physicians dissented from the idea and claimed that it was due to an unknown germ or even a filterable virus. A sort of diagnosis chaos by which they were aware they did not have effective remedies. With regard to Asturias, the first therapeutic approach was issued on September 30, 1918 by the Provincial Health Board in a an entitled document “Instructions against the flu” where they openly recognized that it was the flu and consequently advised not to maintain contact with sick people, to avoid closed rooms and to clean the rooms of

the house and the body, especially the nose and mouth. When they felt the first symptoms, they should lie in bed and call the doctor. A few days later the same Board directed the taking of saline purgatives such as sulphate of soda, sulphate of magnesia, water of Carabaña or of Loeches; or simply castor oil. As well as the exclusive ingestion of milk.

Some days later the newspaper *El Noroeste* published an article titled “El trancazo y su tratamiento” submitted by the Asturian doctor based in Madrid A. R. Vigón where he indicated that was convenient to maintain the room between 14 to 15 degrees centigrade, and provide “sudorific tonic, quinine, alcohol, etc.” To fight the fever, he invited one or two bleedings in the first 24 or 48 hours, later stimulating sweating for at least two days. He also proposed stillness and moderate ingestion of wines that brought wine or some other cordial beverage.

At present time H1N1 viral strain remains active, under control in a laboratory in Atlanta (Georgia), in an attempt to find out aspects not yet clear about how this

specific virus manages to deactivate first defensive line of the body, interferon, keeping intact the aggressiveness against humans. For all these reasons, we emphasize that the review of the 1918/19 flu is pointed out in Asturias with this article. It is really past, but this pandemic according to the report published in 2016 by the “Commission for the Creation of a World Health Risk Framework for the Future”, with the approval of the US National Academy of Medicine, calculated there is a 20% chance that a new influenza epidemic will appear; it is more they claimed that it was inevitable. The measures that considered that it was necessary to take: maintain an adequate vaccination, training of qualified public health professionals; good disease surveillance systems; effective laboratory networks and collaboration between different communities.

We consider the look at 1918/19 flu in Asturias we show in this study together with other much more valuable studies is a reminder of the considerable progress of science in the field of communicable viral diseases.