

# Assonances / Dissonances Between Epidemics Legionella Pneumophila/COVID-19

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**Abstract:** We want to make a comparison by finding similarities and dissonances between a Legionella epidemic of 2018 and the COVID-19 pandemic of 2020. The clinical and statistical differences of 2 phenomena are highlighted: the Legionella epidemic has affected an area of about 60,000 citizens south of the province of Brescia (Italy). It should be remembered that from the data of the Brescia ATS this epidemiological cluster was characterized by 1017 cases of Legionella Pneumophila of serotypes 1,2,14: 878 cases with access to the Emergency room and 139 cases treated at home by General Practitioners. There were 11 deaths in the 7 municipalities concerned (Montichiari, Carpenedolo, Calvisano, Remedello, Acquafredda, Isorella, Visano) with a death rate of 19.3 x 100,000 compared to the rate of 6.1 x 100,000 of the rest of the ATS with a statistically significant index. The COVID-19 first reported in Wuhan. The official data of the Italian Ministry on the pandemic as of June 6, 2022 are as follows. In Italy: 17,500,000 infected, 167,000 died. In the World: 524,878,000 infected, 6,283,110 died. Legionella Pneumophila and COVID-19 are similar clinical situations for airborne transmission but with completely different etiopathogenesis. From local situation to a global situation. Hence the need to have a circular and holistic approach to health and the great responsibility of the Doctors in raising awareness among the political class and the population on maintaining a correct balance of the various environmental matrices: water, air, earth, fire.

**Keywords:** Legionella Pneumophila (Brescia-Italy) to COVID-19 (World), Environmental Matrices, Responsibility of the Doctors-Health Structures

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## 1. Introduction

Following a serious Legionella epidemic in September 2018 in the province of Brescia (Italy) and the 2020 COVID-19 pandemic, I would like to analyze the similarities and dissonances between an epidemic and a pandemic.

The first datum is the extreme diversity of the phenomenon: the Legionella epidemic affected an area of about 60,000 citizens south of the province of Brescia along the Chiese river. On the contrary, COVID-19 has become a global pandemic in the world.

The second datum is the difficulty in obtaining adequate information from both local and national health structures or from the WHO. [4, 6]

The third datum is the panic created among the population in the face of an unclear event. This has created uncertainty among the population and undetermined the relationship of trust towards health facilities. [1, 2, 6-8, 11, 13, 14, 16, 18, 21]

## 2. Materials and Methods

Legionella Pneumophila is a Gram negative bacterium first identified in a hotel in Philadelphia (USA) in 1976 during a convention of legionnaires (hence the name of Legionella) with 34 deaths equal to 15% mortality. It lives between 25° and 42° and is transmitted by air through water vapor. 50 different species with 71 different serotypes are recognized. [1, 3, 7, 17]

From the diagnostic point of view, it is possible to make a certain diagnosis by detecting the urinary antigens and blood antibodies (IgM and IgG) of serotype 1 only while a genetic examination is needed through the PCR (Polymerase Chain Reaction) to identify the other much rarer serotypes and Rx / Chest CT scan. [4, 5]

The symptoms are characterized by hyperpyrexia (39°-40°), severe asthenia, dyspepsia, dyspnea with cardiac

complications (pericarditis) [6].

The therapy is based on antibiotics such as macrolides, azithromycin and levofloxacin as well as oxygen therapy, etc.

It should be remembered that from the data of the Brescia ATS this epidemiological cluster was characterized by 1017 cases of Legionella pneumonia of serotypes 1,2,14: 878 cases with access to the emergency room and 139 cases treated at home by general practitioners. There were 11 deaths in the 7 municipalities concerned (Montichiari, Carpenedolo, Calvisano, Remedello, Acquafredda, Isorella, Visano) with a death rate of  $19.3 \times 100,000$  compared to the rate of  $6.1 \times 100,000$  of the rest of the ATS with a statistically significant index. [4, 6]

COVID-19 is a virus of the coronavirus family, a non-cellular structure but with a capsid and an RNA strand that needs the structures of a cell to replicate. It is transmitted by air via the human flugge droplets of the oral and nasal cavities.

Dr. Liu Wen Lian who died on January 1, 2020 identified COVID-19 for the first time in China on December, 2019. It looks like a new virus whose clinic has been studied in its multiple genetic and clinical aspects in recent months by numerous clinicians, pathologists and epidemiologists. [18, 21]

The problem arises of understanding how COVID-19 was formed with part of a natural genome and part of an exogenous genome, effectively creating a chimera. We hypothesize an engineering through molecular biology techniques or experiments called "Gain of Function" (GoF). [19].

The Nobel Laureate Montaigner said that COVID-19 was prepared in the laboratory by inserting genetic sequences of HIV, the AIDS virus, thus favoring the ability to interact with the ACE-2 receptor [21].

Symptoms vary in intensity according to the patient's clinical conditions: hyperpyrexia, dry cough, altered smell and taste, gastro-intestinal symptoms, increased respiratory rate and increasingly worsening dyspnea with subsequent involvement of the cardio-vascular and renal system for the formation of venous and arterial thrombosis and consequent emboli that can give myocardial infarction or cerebral stroke. [18, 21]

To date, the diagnosis can be made not only on the clinic, but on the serological test by studying antibodies (IgM and IgG), on the throat and nasal swab to study the presence of the virus, culture examination of the pulmonary sputum, X-ray, ultrasound and CT scan of the chest. Indices of inflammation (C reactive protein, D-dimer, Interleukin 6) and possible blood culture for sepsis. The oxygen saturation index of the blood through the oximeter above 94% is certainly important for the evolution of the disease. [18, 21]

The therapy of COVID-19 has been the subject of controversy in the medical field, given the initial lack of knowledge of this viral disease. According to the various stages of the disease, the following can be used: lopinavir / ritonavir, hydroxychloroquine phosphate off label, cortisone,

enoxaparin 6000 IU, oxygen therapy with a  $PO_2 < 93\%$ , hyper immune plasma, monoclonal antibodies and, from May 2022, with antivirals (paxlovid\* e veklury\*) [18, 21].

### 3. Conclusion

The official data of the Italian Ministry on the pandemic as of June 6, 2022 are as follows.

In Italy: 17,500,000 infected, 167,000 died.

In the World: 524,878,000 infected, 6,283,110 died [18].

I remember that the Infectious Diseases Center of Imperial College London hypothesized in March 2020 a percentage of 9.8% of the Italian population of asymptomatic infected people that is about 5.9 million citizens [10, 14, 18]. Data underestimated by one third compared to the real figure of 2022. A similarity between the Legionella epidemic and the COVID-19 pandemic is the evident airborne transmission of the bacterium and the virus with an initial involvement of the respiratory system with a sense of "air hunger". Air and Oxygen are in fact a precondition for life, which results in the anguish of death for every living being. Another similarity can be highlighted by the poor air quality of the entire Po Valley in Northern Italy and of Wuhan, one of the most polluted cities in China. The pre-Covid and post-Covid satellite images of the Po Valley are significant, showing the drastic reduction of pollution after the lock down: reduction of  $CO_2$ ,  $NH_3$  and Particular Matter  $PM_{10}$  and  $PM_{2.5}$  with great benefits of the quality of the respiration of the whole population. It should be remembered that the study by SIMA (Italian Society of Environmental Medicine) and the Universities of Bologna and Bari demonstrate how particulate matter can act as a carrier for viruses in general [18]. This suggests that the enormous industrial development and intensive agriculture in the north of Italy may have a correlation with the greater presence of COVID-19 in the north. [12, 13, 15, 18]. A consequent reflection is, therefore, the unique and unrepeatability opportunity today to review the development paradigms of our current society which must aim at a better relationship between Man and Nature, aiming at a more equitable and sustainable development towards a green economy. Even in ancient Chinese culture, human health is directly linked to Heaven and Earth: that is, the state of health of the air and the state of health of the earth and water [15].

The COVID-19 pandemic has in fact created a gap between a before and an after. Everyone is serious about living in an interconnected world where the relationship between man and the environmental, biological and social dimension is evident [20].

A healthy body in balance between the primary elements such water, air, earth and fire while disease is an expression of imbalance between these matrices [19, 20].

Hence the need to have a circular and holistic approach to health and the great responsibility of the Doctors in raising awareness among the political class and the population on maintaining a correct balance of the various environmental matrices [19, 20].

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