ISSN online 1688-4221 Ciencias Psicológicas January-June 2021; 15(1): e-2555
doi: https://doi.org/10.22235/cp.v15i1.2555

From the Athens's plague to the pink plague: the history of pandemics before COVID-19

Las pandemias precedentes a la COVID-19: de la peste de Atenas a la peste rosa

As pandemias anteriores à COVID-19: da peste de Atenas à peste rosa

***Marcelo Rodríguez Ceberio**, ORCID 0000-0002-4671-440X*

Universidad de Flores. Escuela Sistémica Argentina

***Abstract*:** In world history, great epidemics not only caused thousands of deaths, but also emotional, psychosocial and even economical crises. But in the end, resilience gained territory, causing great learning and increased capacity for adaptation and survival. This article is the first of two, which categorize the great epidemics that hit the world during various periods of history. Its symptoms and its etiology are described within the historical context. Epidemics and pandemics are the result of variables such as poverty, lack of hygiene and a serious tendency to individualism, among others; in addition to stress factors that are the result of an accelerated rhythm of life, all of which survive to this day.

Keywords: COVID-19; pandemic; plagues; epidemics; context

Resumen: Las grandes epidemias de la historia no solo ocasionaron muertes, sino crisis emocionales, psicosociales y económicas. Pero al final de cuentas la resiliencia ganó terreno, generando un gran aprendizaje y el incremento de la capacidad de adaptación y supervivencia. El presente artículo es el primero de dos, que categorizan a las grandes epidemias que azotaron al mundo en diversos períodos de la historia. Se describen sus síntomas y su etiología enmarcados en su contexto histórico. Epidemias y pandemias son el resultado de variables como la pobreza, la falta de higiene, una grave tendencia al individualismo, entre otras; además del factor de estrés, producto de un ritmo de vida acelerado, todos estos factores perviven hasta nuestros días.

Palabras clave: COVID-19; pandemia; pestes; epidemias; contexto

***Resumo*:** Na história do mundo, as grandes epidemias não causaram apenas mortes na população, mas também crises emocionais, psicossociais e até econômicas nas pessoas que conseguiram sobreviver a tais catástrofes. Entretanto, no final, a resiliência ganhou território, gerando grande aprendizado e aumento da capacidade de adaptação e sobrevivência. Este artigo é o primeiro de dois, que categorizam as grandes epidemias que atingiram o mundo em vários períodos da história. Seus sintomas e sua etiologia são descritos dentro do contexto histórico. Epidemias e pandemias que resultam de variáveis como pobreza, falta de higiene, grave tendência ao individualismo, entre outras; além de estressores decorrentes de um ritmo de vida acelerado, que permanecem até os dias de hoje.

Palavras-chave: COVID-19; pandemia; pragas; epidemias; contexto

Received: 08/31/2020 Accepted: 03/24/2021

How to cite:
Rodríguez Ceberio, M. (2021). From the Athens's plague to the pink plague: the history of pandemics before COVID-19. *Ciencias Psicológicas, 15*(1), e-2555. doi: ttps://doi.org/10.22235/cp.v15i1.2555

Correspondence: Marcelo Rodríguez Ceberio. Universidad de Flores. Escuela Sistémica Argentina. E-mail: marcelorceberio@gmail.com

Introduction: crisis, society and plagues

Crises are opportunities for growth despite the fact that they generate revolutions in systems at multiple levels: a great mass of entropy that messes the status quo. They are defined as a state of maximum tension that breaks the stability of a system (Ceberio & Watzlawick, 1998).

Although there are crises that follow the evolutionary script of life, other critical situations are not expected: natural phenomena such as earthquakes and tsunamis, or deaths in evolutionary cycles that are not expected, pandemics and epidemics, accidents, etc. (Hoffman, 1987). Therefore, the pandemic and the consequent quarantine that we are experiencing –both declared by the World Health Organization (WHO)– are situations that fall within the second group (Pérez Abreu, Gómez Tejeda, & Dieguez Guach, 2020; Trilla, 2020). Let us take into account the difference, since the first disruptive crisis is the pandemic itself that brings fear of contagion, anguish and anxiety (Ceberio, 2020a) and quarantine as a result, which as a protective method involves high anxiety levels to which uncertainty is associated (Ceberio, 2020b).

An epidemic refers to an increase in the number of cases of a disease above what is normally expected in that population in that area, escaping the possibility of socio-sanitary control (De Rezende, 1998). Historical pandemics have been real crises that devastated different contexts of humanity, even some of them have eliminated more people than world wars (Esparza, 2016; Villamil Jiménez, 2013). From ancient times until today they have left a sequel of effects that marked the construction of a new history. We are currently in the presence and we are witnesses of one of this pandemics: COVID-19.

The deadly pests

In ancient times, whatever the origin, characteristics or symptoms, the name of *plague* was given to epidemics. For example, in ancient Greece, Hippocrates (460 BC-370 BC) considered that the plague was a disease that appeared in the hot and humid seasons (Giménez & Pardo, 2018).

The plague of Athens (430-426 BC) was truly chaotic and devastating for the Greek world in all its dimensions. It is believed that it came from Ethiopia (Africa) to Athens on the ships of trades and wars. The oldest authors considered this disease as an affection of divine origin, which was transmitted through the air. Current research findings agree that it may have been typhoid. The result of this epidemic was that Athens lost a third of their population, among them the Athenian infantry and marine experts. Pericles also died from this disease (Giménez & Pardo, 2018; Castañeda Guillot & Ramos Serpa, 2020).

Following the Athens's plague, the Agrigento's plague and the Syracuse's plague striked with similar symptoms. Syracuse's plague occurred in 396 BC, when the Carthaginian army besieged Syracuse in Italy, and it decimated the army of Carthaginian soldiers (Rodríguez, 2020). Most

"plagues" had almost identical symptoms: fever, respiratory abnormalities, intercostal pain, dysentery and pustules all over the body.

In the second century, Rome suffered the ravages of the Antonine plague, the emperor Marcus Aurelius was one of its most notable victims. The plague caused halitosis and burning in the eyes, gangrene, great thirst and internal burning, delusions and coughing. People died within ten days (Marcone, 2002; Ruiz-Patiño, 2020). This plague spread throughout Italy, reaching as far as Gaul (Buora & Jobst, 2002).

The Justinian plague takes its name because Emperor Justinian suffered from it and is estimated to have killed almost 25 million people in the Mediterranean. Among the symptoms were: sudden fever, swelling in the armpits, muscles and cartilage of the ears. This pandemic began in the 6th century and the epicenter of the outbreak was Constantinople (Ortiz, 2020). It's believed that this plague was caused by a strain of Yersinia pestis, the same bacteria that causes bubonic plague or black plague, and is a mixture of several pests such as bubonic plague, smallpox, or cholera. The three of them were devastating, although it is quite difficult to estimate (Cravioto & García, 2013a; Rius i Gibert, 2019).

The Black Death, or bubonic plague, was the most lethal pandemic in history and mainly devastated Europe. This condition, which had its first outbreak in 1347, was already known throughout the world as the Black Death due to the brown spots that appeared as a result of subcutaneous hemorrhages. It had social implications because it caused the death of 75 million people. It was transmitted through fleas and rats; rats proliferated in medieval cities in the drains and the dirt and garbage of the streets (Callicó, 1970; Cravioto & García, 2013b). Symptomatically, it caused inflammation of infected lymph nodes in the sexual organs and eyes. But the bubonic plague appeared for the third time and was called the *third pandemic*. The virus was located in the Yunnan province in China and remained active until 1959 and over ten years led to the death of more than 12 million people (Cravioto & García, 2013b).

Between fleas and mosquitoes

Many Spaniards in the conquest suffered from yellow fever, which for centuries was one of the most serious public health problems of humanity. Although the development of its vaccine managed to reduce the possibility of contagion to jungle areas only. It should be noted that the disease did not appear at the time of the conquest only, but extended until the 19th century. A virus of the *Flaviviridae* family, which is transmitted by mosquito bites (Restrepo, 2004), produces yellow fever. The outbreaks increased in the summer months and disappeared in the winter season, to reappear in full force the following summer; although those that had already been infected were much more resistant when they had it again (Galeano, 2009; Restrepo, 2004).

Typhus has produced devastating epidemics for centuries, transmitted by vectors such as insects and other arthropods (González-Hernández et al., 2017). The first known typhus epidemic took place during the siege of Granada by the Catholic Monarchs in 1489. It usually affects rural or very isolated populations due to the main vectors and their animal reservoirs. Although typhus has killed more than 4 million people throughout its history, it is not dangerous today.

Malaria is an acute febrile disease and currently kills more than half a million people a year, mainly in Africa. Thanks to the pesticide DDT (dichloro diphenyl trichloroethane) it disappeared from Europe, where it was endemic, in countries such as Greece or Italy. In Spain it went from 400,000 cases and more than 1,300 deaths in 1943 to completely disappear in the 1960s (Ceberio,

2020a). Malaria is caused by parasites of the genus *Plasmodium*, which are transmitted to humans by the bite of female mosquitoes of the genus *Anopheles*. If it is not treated in the first 24 hours, it can worsen, often leading to death (Pereira & Pérez, 2002).

Contagions on the conquest's ships

Smallpox is another of the highly contagious diseases that hit human history. It is caused by the *Variola virus* (Campillo, 2014), which the conquerors brought to America when they crossed the ocean from Europe. It has had a mortality rate up to 30 %, and 300 million people have died of it. The smallpox outbreak in the 18th century was devastating, until E. Jenner designed the first vaccine in 1796 (Huguet Pané, 2020). It was eradicated in 1980.

Scurvy was also a pathology that was contracted on transoceanic voyages in the Middle Ages. Spanish and Portuguese sailors brought it on trips for years, figures such as Vasco de Gama and Magallanes suffered from it. Until the middle of the 18th century, it was not related to the lack of vitamin C caused by the lack of fresh fruits and vegetables in their diet (Jáuregui-Lobera, 2017; Rizzi, 2004).

In the Renaissance, syphilis was one of the sadly most relevant diseases. It was interpreted as a stigma because it's transmitted through sex encounters. The organism that causes it is *Treponema pallidum* and it came to Europe from America, it is believed that it spread through Europe after the siege of Naples in 1495, spread by the Spanish to Italian prostitutes. In other words, the contagion occurs through sex, is transmitted to the offspring and affects both sexes equally with a certain preponderance in young people (Leitner, Körte, Edo & Braga, 2007).

The Veronese doctor Girolamo Fracastoro introduced the term *syphilis*, when he published the poem *Syphilis sive morbus gallicus* (1530). In it he describes the disease and proposes naming the disease in honor of a shepherd named Syphilo (Berdasquera Corcho, Lazo Álvarez, Galindo Santana & Gala González, 2004; Comerio, 2012). At the beginning of the 20th century, 15 % of the European population suffered from it, including Baudelaire, Van Gogh, Nietzsche, Beethoven, Wilde, Colón, Joyce and Hitler (Comerio, 2012).

Between deformity, the Broad Street well and the pink plague

Leprosy is an infectious and chronic disease caused by the bacillus *Mycobacterium leprae*, which affects the mucous membranes, bones, skin, testicles and peripheral nerves. Unfortunately, those infected have a disfiguring and incapacitated appearance due to the neurological complications that it produces. In the Middle Ages it was believed that lepers fell ill as a God punishment for their sins and their promiscuous behaviors. With this stigma, they were abandoned outside the villages and dispossessed of their property. They used a bell to announce themselves or carried small boards in their hands to warn people of their presence (Guerrero, Martínez, Diéguez, Arrazola & Guzmán, 2012). Jacinto Convit discovered the cure for this disease in 1987, four centuries after (Suárez & Lombardi, 1997).

On the other hand, polio has been known for three millennia, although its vaccine is just over half a century old. It is an infectious disease that affected a large number of people during the first half of the 20th century. The best-known epidemic focus was the one that developed in New York in the 1920s and that would infect even the president. Polio has been a major cause of disability and death in childhood for centuries, until the arrival of the vaccine in the mid-1950s (Testa, 2012).

The cholera pandemic reached Europe in 1830 and caused approximately 30,000 deaths in London, until doctor John Snow discovered that they all had in common the water from the Broad Street. This disease is caused by a bacterium, *Vibrio cholerae*, and its symptoms are composed of fevers and abdominal pain, and causes fatal dehydration with which the body loses water due to diarrhea. Starting in the 20th century, this disease spread to Asia and Africa, where it continues to be active (Sánchez Lera & Pérez Vázquez, 2014). The lack of treatment of human excrement and the absence of drinking water are the main causes for the spread of cholera (González Valdés, Casanova Moreno & Pérez Labrador, 2011).

Measles is considered the second deadliest pandemic. The disease has been known for more than 3,000 years and its main problem is the high rate of infection. It is a disease that develops reddish spots throughout the body, high fevers and lung inflammation (Campillo, 2014). The form of contagion is through direct contact and through the air through the drops of vapor that we exhale. Death in measles occurs from inflammation of the lungs or meninges. Although the contagion has been controlled, measles has killed more than 200 million people and has not yet been definitively eradicated, despite the efforts of the WHO (Infosalus, 2020).

HIV (Human Immunodeficiency Virus) is a pandemic that continues to exist today. In 1981, Luc Montagnier discovered in France the first cases of this disease. This virus causes a disorganization and deterioration of the immune system, making the person vulnerable to any disease. The virus is not lethal itself, but it destroys the defense capacity against other common diseases, so that the slightest infection can be lethal (Alcamí, 2008; Swenson, 1989). The most widespread theory is that it was contracted from people who hunted or ate infected chimpanzees, probably in the late 19th or early 20th century. However, how the disease crossed the species barrier remains unknown.

Since the first cases of HIV were reported, 78 million people have contracted the virus and 35 million have died from AIDS-related illnesses, according to data from the United Nations program (Infosalus, 2020). It is transmitted through blood and body fluids. Although this virus has no cure, in the 1990s drugs were developed as part of various treatments and together with lifestyle modifications make the disease stop and can be controlled. Only 50 % of the world's population living with HIV receives antiretroviral treatment. For this reason, AIDS continues to be a challenge for world science and every year research continues to try to end this disease. At the moment, only two people have managed to be cured, but it is a great advance that gives hope for the future (Grmek, 1992; Swenson, 1989).

Conclusion: context and epidemics

This first historical journey has been marked by devastating epidemics that caused millions of deaths. In different contexts, from ancient Greece with the plague of Athens, medieval times, conquests and syphilis, to postmodernity and HIV, diseases were associated with death, eviction and depression.

It is not only about disease and contagion, preventive methods, hygiene and asepsis, or quarantine; there are other emotions that surround the pandemic. Pain, anguish, unbearable physical symptoms –with scarce palliative drugs– as well as social and economic catastrophe affect a pandemic, leading to the redefinition of values and lifestyle, myths that collapse, creation of new jobs and even new forms of social relationship.

The deaths create depression and griefs that brought anxiety and sadness, families fell apart. They have also generated emergency health policies, scientific advances regarding various diseases, prevention plans and treatment models. In other words, major pandemics as crises have had their social, cultural, political and economic backlash, generating opportunities for change and modifications that continue until today.

All these entropic developments in each pandemic have their counterpart. The factors of solidarity, attention, affection and social partnership are some of the results that define a resilient attitude. With which, what has been learned in each critical situation is applied into the future, as in fact we can observe in our days with the COVID-19 pandemic, which antecedents, SARS and MERS, favored the organization of the emergency situation.

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Authors' participation: a) Conception and design of the work; b) Data acquisition; c) Analysis and interpretation of data; d) Writing of the manuscript; e) Critical review of the manuscript.
M. R. C. has contributed in a, b, c, d, e.

Scientific editor in charge: Dra. Cecilia Cracco.