

## World epidemics in the history of humanity: on the example of the “black death”

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**Abstract:** The article is devoted to pandemics in the history of human society on the example of the "black death".

**Keywords:** Epidemic, human history, pandemic, plague, middle ages, “Black Death”

The coronavirus epidemic remains one of the hottest medical agendas of the day. But, fortunately, this certainly dangerous infection is still not the most deadly disease that humanity has encountered. In the days when everyone is talking only about the coronavirus, it is important to remember that global epidemics and pandemics in the history of mankind, which covered many countries and claimed thousands and millions of lives, have happened before. It was one of these that was the plague epidemic, which went down in world history as the “black death”.

“Black Death” (or “black pestilence” from Latin “Atra mors”) is a plague pandemic that peaked in 1346-1353, and repeated outbreaks continued until the 19th century. Tens of millions of people became victims of the disease: according to various estimates, from 30% to 60% of the population of Europe died from the disease..

In all likelihood, the pandemic began in Central or East Asia. So, in 1338-1339, near Lake Issyk-Kul on the territory of modern Kyrgyzstan, there was a surge in deaths from the Black Death. In Europe, in all likelihood, the plague came from the northern coast of the Caspian Sea, from where the disease spread to most of Eurasia and North Africa.

The infectious agent was the *Yersinia pestis* plague bacillus, which was confirmed by genetic studies of the remains of the victims of the pandemic; however, some researchers put forward alternative theories about the nature of the black death. The ineffectiveness of medieval medicine and religious institutions in the fight against the plague contributed to the revival of pagan cults and superstitions, the persecution of potential "poisoners" and "distributors of plague poison", as well as a surge of religious fanaticism and religious intolerance. The Black Death left a

colossal mark on the history of Europe, leaving an imprint on the economy, psychology, culture and even the genetic composition of the population. Most European contemporaries described the disease with the word *pestilentia* (Latin for "epidemic") and its derivatives, sometimes in combination with the epithet "great"; in some languages, the expressions "great" or "sudden death" were used. In the Russian chronicles, the bubonic form of the disease is called "iron pestilence", and the pulmonary form is called "karkota pestilence".

The expression "black death" (lat. *atra mors*) was originally used in a figurative sense and was not associated with the symptoms of the plague. For the first time, the plague epidemic is described in this way in Seneca's tragedy *Oedipus*. In relation to the epidemic of the XIV century, the expression "black death" (Latin *mors nigra*) is first found in a poem published in 1350 by the Parisian astrologer Simon Kovinsky. The Venetian poet Giacomo Ruffini, describing the outbreak of the plague of 1556, calls it "the black disease, the monster of darkness" (lat. *atra lues, Monstra nigrantis*). Cardinal Francis Gasquet suggested in 1908 that the name "Black Death" was attached to the 14th-century epidemic at the suggestion of the Dutch historian Johann Pontanus, who claimed in 1631 that it "because of the symptoms was called *atra mors*." However, this name only became widespread in the 19th century, as it was used in popular history textbooks by Elisabeth Penrose and also in the monograph of the German physician Justus Haecker "Der schwarze Tod im vierzehnten Jahrhundert" (with German. - "Black Death in XIV century"), which, with reference to Pontanus, explained its origin by blackening of the skin.

The name "Black Death" is also erected to the fact that the corpses of those who died in the epidemic of 1346-1351 quickly turned black and looked as if "charred", which terrified contemporaries. The incubation period for plague varies from several hours to 9 days.

Taking into account the method of infection, localization and prevalence of the disease, the following clinical forms of plague are distinguished: cutaneous, bubonic, primary pulmonary, primary septic, intestinal, secondary septic and blistered. The last two forms are now rare, and during medieval epidemics, when almost every case of plague ended in death, on the contrary, often. The causative agent penetrates through skin lesions due to the bite of a flea or a plague-stricken animal, through the mucous membrane or by airborne droplets. Then it reaches the lymph nodes, in which it begins to multiply rapidly. The disease begins suddenly: a severe headache, high fever with chills, the face is hyperemic, then it darkens, dark circles appear under the eyes. *Bubo* (enlarged inflamed lymph node) appears on the second day of illness.

Pneumonic plague is the most dangerous form of the disease. It can occur either as a result of a complication of bubonic plague, or when infected by airborne droplets.

The disease also develops rapidly. A patient with pneumonic plague poses an exceptional danger to others, as he releases a large number of pathogens with sputum.

The bubonic form of plague develops when the pathogen enters the bloodstream through the skin. At the first protective line (in the regional lymph nodes), it is captured by leukocytes. Plague bacilli are adapted for reproduction in phagocytes. As a result, the lymph nodes lose their protective function, turning into a "microbial factory". In the lymph node itself, an acute inflammatory process develops, in which its capsule and surrounding tissues are involved. As a result, on the second day of the disease, a large painful seal is formed - the primary bubo. Lymphogenic pathogens can penetrate into the nearest lymph nodes, forming secondary buboes of the first order.

The Black Death had significant demographic, social, economic, cultural and religious consequences, and even affected the genetic makeup of Europe's population by changing the blood type ratios in affected populations. In the Eastern countries, the consequences of the plague had a serious impact on the Golden Horde, where a sharp decline in population led, among other things, to political instability, as well as technological and cultural regression. According to William Neify and Andy Spicer, the demographic situation in Europe finally stabilized only by the beginning of the 19th century - thus, the consequences of the Black Death were felt over the next 400 years. Many villages were deserted after the death or flight of the inhabitants, and the urban population also decreased. Part of the agricultural land fell into disrepair, it came to the point that wolves, having bred in huge numbers, began to be found in abundance even in the suburbs of Paris.

According to the French medievalist historian Georges Duby, by 1390 the population of Normandy was only 43% of the population at the beginning of the 14th century. The epidemic led to the fact that, due to a sharp decrease in the population, traditions that previously seemed unshakable were shaken, and feudal relations gave their first crack. Many workshops, which were practically closed, where the craft was passed from father to son, now began to accept new people. In a similar way, the clergy, which had significantly thinned during the epidemic, as well as the medical class, were forced to replenish their ranks; due to the lack of men, women began to be drawn into the sphere of production.

The time after the plague epidemic became a true time of new ideas and the awakening of medieval consciousness. In the face of a formidable danger, medicine woke up from a centuries-old hibernation, which since that time has entered a new stage in its development. In addition, the lack of workers allowed day laborers, farm laborers and various servants to bargain with their employers, demanding better working conditions and higher pay for themselves. The survivors often found themselves in the position of wealthy heirs who received the lands and incomes of

relatives who died during the great epidemic. The lower classes immediately took advantage of this circumstance in order to achieve for themselves a higher position and power.

During the Black Death, medicine in Christian Europe was in deep decline. This was largely due to the primitive religious approach to all areas of knowledge. Even in one of the largest medieval universities - Paris - medicine was considered a secondary science, as it set itself the task of "healing the mortal body." This is illustrated, among other things, by an anonymous 13th-century allegorical poem about the "Marriage of the Seven Arts and the Seven Virtues". In this essay, Lady Grammar marries her daughters - Dialectics, Geometry, Music, Rhetoric and Theology, after which Lady Physics (the then name of medicine) comes to her and also asks to find her a husband, receiving an unambiguous answer from Grammar: "You are not from our families. I can't help you." Some leadership of that time, the author of which remained unknown, charged the doctor, after entering the house, to ask the patient's relatives whether he had confessed and had received the Holy Mysteries. If this was not done, the patient had to fulfill his religious duty immediately, or at least promise to do so, for the salvation of the soul was supposed to be more important than the salvation of the body.

Surgery was considered too dirty a craft that church rules did not allow a priest to practice, even one with a medical education, which meant in real life a clear separation in Europe of the professions of a doctor (physician) who studied at the university of ancient medicine and a less learned surgeon-practitioner (surgeon), almost always belonging to different departments. Anatomy of the dead was never forbidden, but it actually spread only from the 14th-15th centuries. , the theoretical study of anatomy from the books of Galen remained predominant.

In the then science of epidemic diseases, two main directions fought. The first, associated with the name of one of the last atomists of antiquity, Lucretius Cara, believed that the cause of their occurrence was some "seeds of illness" invisible to the eye, or the smallest disease-causing "cattle" (Marcus Varro), which penetrated into the body of a healthy person upon contact with a sick person. This doctrine, which later received the name of the doctrine of contagion (that is, "infection"), in those days received its further development after the discovery of van Leeuwenhoek. As a means of preventive control of the plague, contagionists proposed isolation of the sick and long quarantines: "Public disputes should be carefully avoided, as far as possible, so that people do not breathe on each other and one person cannot infect several. So, one should remain alone and not meet people who have arrived from those places where the air is poisoned.

However, the presence or absence of invisible "plague cattle" seemed rather speculative; especially for the doctors of that time, the theory of "miasms", created by

the great minds of antiquity - Hippocrates and Galen - and then developed by the "sheikh of doctors" Avicenna, seemed attractive. Briefly, the essence of the theory can be reduced to the poisoning of the body with a certain poisonous substance ("pneuma"), released from the bowels of the earth. It was based on a completely sensible observation about the fatality for people of the fumes of marshes and other "unhealthy places" and the attachment of certain diseases to certain geographical points. From here, according to the "miasmatics", the wind is capable of carrying poisonous fumes over great distances, and the poison can both stay in the air and poison water, food and household items. A sick or dead body becomes a secondary source of miasma - which was "confirmed" during the plague epidemic by the heavy smell accompanying the disease, and the stench of a corpse. However, even here the doctors differed in their understanding of where poisonous fumes come from. If the ancients without hesitation considered them to be the cause of "teluric" (that is, soil) secretions, which are normally safe, which marsh rotting turns into a deadly poison, in the Middle Ages there were opinions about the cosmic influence on the process of the emergence of "miasms", moreover, as the main culprit the planet Saturn stood out, identified with the apocalyptic horseman - "Death". According to the "miasmatics", the tidal action of the planet awakens the toxic fumes of the swamps.

Cleansing the air in an infected area or house. For this purpose, herds were driven through the city so that the breath of animals would purify the atmosphere (one of the experts of that time attributed this ability to horses and therefore strongly advised his patients to move to the stables during the epidemic). They put saucers of milk in the room of the deceased in order to absorb the infection in this way. For the same purpose, spiders were bred in houses, capable, according to the belief of that time, to adsorb poison spilled in the air. Fires were burned in the streets and fumigated with the smoke of aromatic herbs or spices. In order to disperse the contaminated air, they rang bells and fired cannons. In the rooms, for the same purpose, small birds were released to fly, so that they would ventilate the room with the flapping of their wings.

Individual protection, which was understood as the creation of a kind of buffer between a person and an infected environment. In view of the fact that the effectiveness of such a buffer defense could be determined solely with the help of one's own sense of smell, it was considered good if it was possible to completely destroy or at least weaken the "plague smell". For this reason, it was recommended to carry and often sniff flower bouquets, perfume bottles, fragrant herbs and incense. It was also advised to tightly close windows and doors, to cover the windows with wax-soaked cloth in order to prevent the penetration of contaminated air into the house. However, sometimes it was proposed to kill the plague stench with an even more cruel stench - recipes of this kind were sometimes dictated by despair and

helplessness. So, the Crimean Tatars scattered dog corpses through the streets, European doctors advised keeping goats in their homes. Even recommendations were given to stay long in the latrine, inhaling the aromas there, since there were observations that cleaners of latrines suffered less from the epidemic. Such a proposal, however, caused a protest already among the then experts, who pointed out that such a thing was "disgusting in a normal situation, and it is difficult to expect it to help during an epidemic."

The best minds of the Middle Ages were not deceived about the possibility of curing plague patients. The medieval physician's arsenal, which included plant or animal based medicines, as well as surgical instruments, was completely powerless against the epidemic. The "father of French surgery" Guy de Chauliac called the plague "a humiliating disease", which the medical class had nothing to oppose. The Franco-Italian doctor Raymond Chalen di Vinario noted, not without bitter cynicism, that "he cannot condemn doctors who refuse to help the plague-stricken, because no one wants to follow their patient." In addition, with the intensification of the epidemic and the growing fear of the plague, more doctors also tried to find salvation in flight, although this can be countered by genuine cases of dedication to their work. So, Chauliac, by his own admission, only "fear of dishonor" kept him from fleeing, di Vinario, against his own advice, remained in place and died of the plague in 1360. The clinical picture of the plague, from the point of view of medicine of the XIV century, looked like this: miasma, having penetrated into the body, gives birth to a poison-filled bubo or boil in the region of the heart, which, then, breaking through, poisons the blood.

Attempts at treatment, although extremely ineffective, were still made. Chauliac opened the plague buboes and burned them with a red-hot poker. They tried to treat the plague, understood as poisoning, with the antidotes that existed at that time, in particular, the "French theriacum", dried skins of toads and lizards were applied to buboes, capable, according to the widespread belief of those times, to draw poison from the blood, for the same purpose they used precious stones, in particular, powdered emerald.

In the XIV century, when science was still closely intertwined with magic and the occult, and many pharmaceutical recipes were compiled according to the rules of "sympathy", that is, the imaginary connection of the human body with certain objects, by acting on which, supposedly, it was possible to treat the disease, there were numerous cases quackery or sincere delusion, leading to the most ridiculous results. Thus, supporters of "sympathetic magic" tried to "pull out" the disease from the body with the help of strong magnets. The results of such a "treatment" are unknown, but they are unlikely to be satisfactory. It seemed most sensible to support the strength of the patient with good nutrition and tonics and wait for the body itself to overcome the

disease. But cases of recovery during the Black Death epidemic were isolated and almost all occurred at the end of the epidemic.

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