# Epidemics among the inhabitants of an early medieval suburb of Wrocław. Can endocranial lesions be a determinant of infectious diseases?

Epidemics of infectious diseases have accompanied humanity for centuries, knowledge about the symptoms and infectious agents was learned gradually, and the knowledge of effective treatment of bacterial diseases was obtained only with the invention of penicillin. Diseases for which currently known treatments have led to the death of a huge number of people in modern times. At that time, frequent wars, epidemics, famine, and floods in Wrocław significantly affected living conditions, causing a large influx of rural communities to settle in the city and its suburbs. Despite the large number of people dying from the epidemic, the city of Wrocław doubled its population over the course of two centuries (16th-18th centuries), causing a dense population and further facilitating the spread of diseases.

The Our Saviour Cemetery was located at Czysty Square in Wrocław and operated from the mid-16th century to the end of the 18th century. Although currently this place is in the very center of the city, during the years of its use it was located outside its walls, in the southern suburbs of Wrocław. Documents and archaeological research show that it was mainly the poorer part of the community living in the suburbs, but also convicts and victims of epidemics, that were buried there.

An anthropologist working with skeletal material can select the remains of people who died of infectious diseases. It does this based on the observed bone pathological changes. However, because the human body responds to infections similarly - by triggering an inflammatory response, bone lesions are often difficult to distinguish whether they are caused by pneumonia, tuberculosis, or plague. Of particular interest to the project are changes created on the inner surface of the skull. They are caused by inflammation and hemorrhages in the meninges, the causes of which may be various, including infectious diseases, including: tuberculosis.

23 individuals were selected for the study in which changes on the inner surface of the skull were observed. One molar tooth was taken from each of them and then sent for laboratory tests. The ancient DNA contained in the tooth pulp will allow us to observe the potential DNA of bacteria causing infectious diseases and identify their species.

The results of the project will make it possible to verify whether people who died during the epidemic were buried at the Our Saviour cemetery in Wrocław, Poland. Additionally, the results will indicate what diseases these people died of and help answer the question: Can intracranial lesions be a determinant of infectious diseases? Directly linking the changes to the presence of ancient DNA of specific bacteria will help develop criteria for diagnosing infectious diseases on skeletal material. Additionally, the test results may draw doctors' attention to the symptoms of meningitis in the course of infectious diseases, potentially improving the diagnosis of these diseases.