

Over the past few decades, we have witnessed the emergence of new infectious agents, SARS-CoV-2 is the third major epidemic of the zoonotic coronavirus that has recently affected people after the SARS outbreak in 2002-2004 and MERS, which began in 2012. In the first days of May 2020, the disease was diagnosed in 3 623 803 people worldwide, from whom 256 880 people (7.1%) died due to the development of COVID-19. In Poland, 14,432 cases of illness and 716 deaths (5.0%) were confirmed until that time. The COVID-19 pandemic revealed that a significant proportion of the Polish population was either not infected or had a benign course in a clinically asymptomatic form. This is particularly evident in patient/resident-care institutions where the population is particularly vulnerable to infection due to disease and age. However, even in those institutions where the infection occurred, most of the exposed people did not become infected, or the infection was asymptomatic. It is therefore possible that modification of the course or even protection against infection was related to the presence in these individuals of antibodies that cross-reacted with SARS-CoV-2 antigens.

In Poland, based on virological research, since the 1960s there were probably seven epidemics of seasonal respiratory tract infections registered, with etiological factors being coronaviruses. In addition, coronavirus epidemics among farm animals are constantly occurring in Poland. It is therefore possible that non-infected or asymptomatic individuals had protective antibodies after previous contact with other coronaviruses.

Study on the mechanisms of immunity directed against coronaviruses based on the analysis of antibodies in sick persons, convalescents and healthy persons residing in Polish patient/resident-care institutions will allow for epidemiological and clinical analysis of factors that may affect the individual course of infection. It is also likely that the sensitivity of continuous surveillance during the ongoing pandemic was too low and we did not know the full scale of the epidemic among long-term care home residents.

The aim of the project is to examine a representative number of sera collected from a homogeneous group of people at various levels of exposure to SARS-CoV-2 virus infection in patient/resident-care institutions for the presence and titre of antibodies to antigens of the above and related viruses. In order to clarify the scope of cross-reactions, studies will be conducted on the reactivity of selected sera of patients with antigens isolated from viruses dominant in the current pandemic in Poland and related coronaviruses. In addition, studies will be carried out on the molecular mechanisms of these reactions using modern immunochemical methods.