

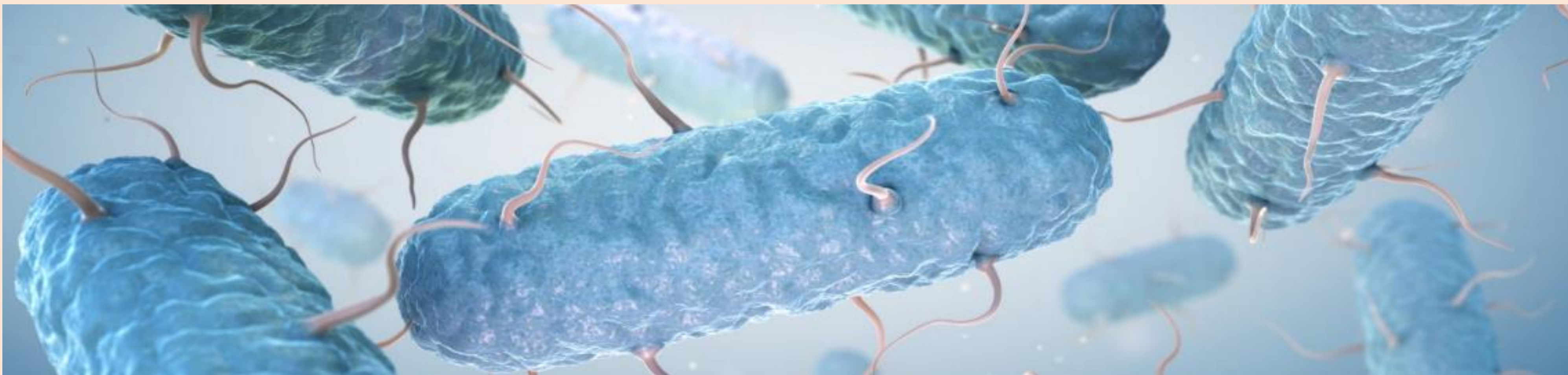
Detection and prevalence of *Bordetella pertussis* disease in Latvia from 2022-2024 by data of National Reference Laboratory.

Authors: G.Muzje¹, L.Eglite¹, I.Davidjuka¹, I.Zajeca¹, Tatiana Katasonova¹, I.Pole¹, O.Savicka^{1,2}

1- Riga East University hospital (REUH), Laboratory Service, Latvian Centre of Infectious Diseases laboratory, National Microbiology Reference Laboratory (NMRL), Riga, Latvia

2- Riga Stradiņš University, Department of Infectology, Riga, Latvia

Objectives



Whooping cough is a bacterial respiratory infection caused by *Bordetella pertussis*. It is characterized as paroxysmal cough, whoop and post tussive vomiting. *B.pertussis* is spreading through air droplets produced with cough or sneezes. The most severe infection occurs in infants and young children but it is usually milder in adolescents and adults who are a source of infection for young children. *B.pertussis* remains a worldwide threat and tends to be a cyclic disease, peaking every 3-5 years.

Detection of *B.pertussis* infection is performed in laboratory on patients with symptoms such as prolonged coaligned coughing with paroxysms and/or whooping or choking. Direct and indirect tests are available in diagnostics of *B.pertussis*. For example RT-PCR (Real time polymerase chain reaction) is a direct test but serological test for specific antibodies - indirect. During the study it was possible to evaluate effectiveness of different diagnostic methods: microbial isolation, serology and RT-PCR in detection of *B.pertussis*.

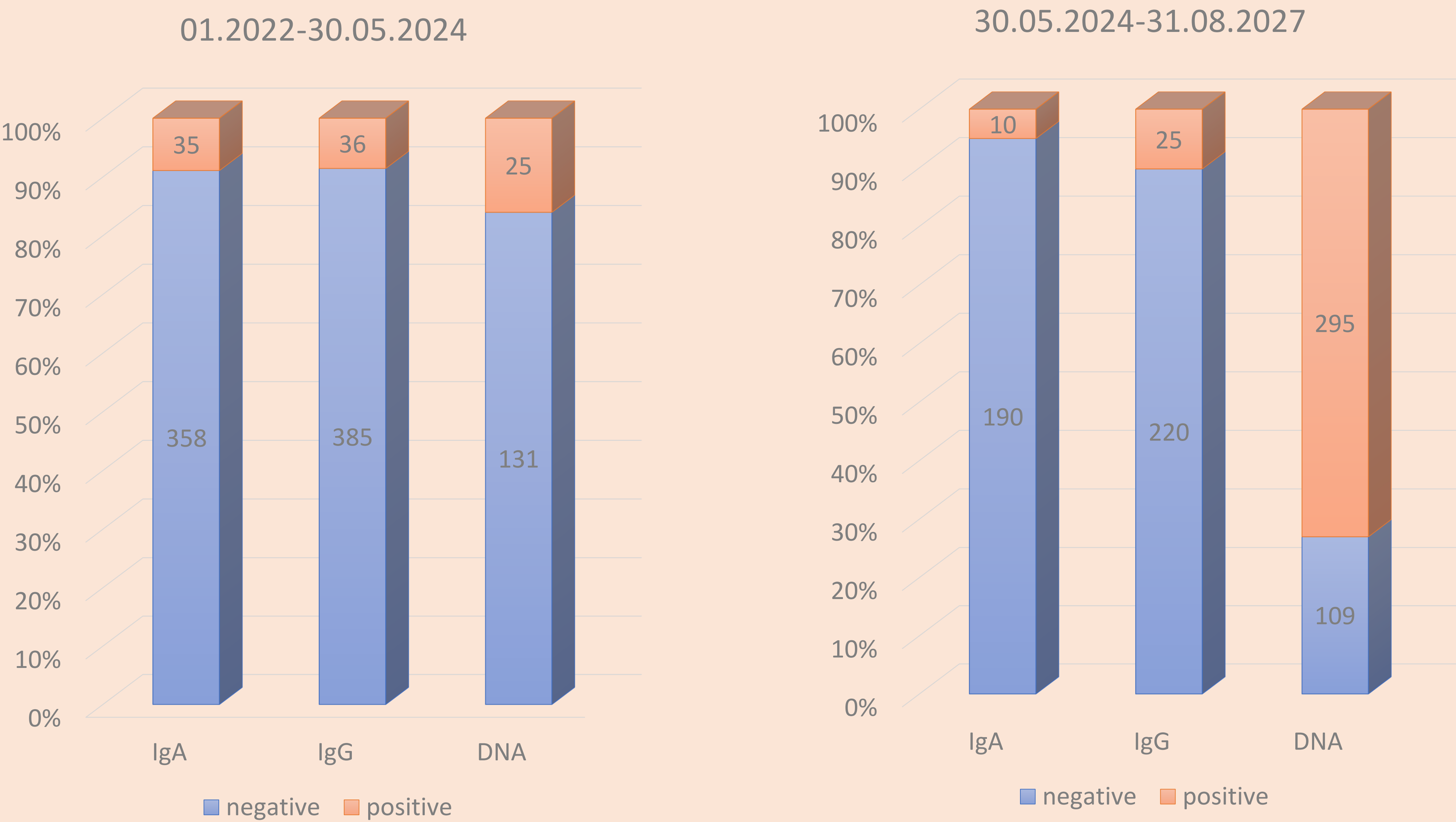
Materials and methods

Study Period: January 2022 – May 2024; June 2024 – August 2024;

- Samples: 2473 samples from different regions of Latvia;
- Testing Method: Real-time PCR (*Bordetella pertussis* and *Bordetella parapertussis* DNA);
- Testing Method: ELISA (*Bordetella pertussis* toxin IgG/IgA);
- Nucleic Acid Extraction: NucliSENS easyMAG (BioMeriux) automated system;
- Demographics: Age range from infants to 99 years old;

Results

- From 01.2022-31.05.2024 393 samples were tested for IgA (35 positive, 8.9%), 421 samples for IgG (36 positive, 8.6%); 156 samples were tested for *B.pertussis*/*B.parapertussis* RT-PCR (25 positive for *B.pertussis*, 16%).
- Due to increase of *B.pertussis* cases from 01.06.24-30.08.2024 200 samples were tested for IgA (10 positive, 5 %), 245 samples for IgG (25 positive, 10.2 %); 404 samples were tested for *B.pertussis*/*B.parapertussis* RT-PCR (295 positive for *B.pertussis*, 73 %).



Conclusions

From 25 *B.pertussis*/*B.parapertussis* DNA positive patients, 15 were tested for antibodies in blood at the same time, but all the results were negative. After 2-4 weeks, blood was collected again from the same patients with positive DNA tests and tested again for antibodies, this time results were positive for all these patients.

From this data we can assume that RT-PCR (DNA test) is better for diagnosing at the early stages of infection, than serology, when the antibodies have not yet been formed.