

## Alessia Raineri

Alessia Raineri's dissertation addressed knowledge gaps using data from Ciao Corona study, a prospective school-based cohort in the canton of Zurich. It evaluated humoral and cellular immune responses to SARS-CoV-2 and assessed Long COVID in children and adolescents.

The Omicron wave and the rollout of vaccines led to almost 100% seropositivity and boosted seroprevalence, anti-spike IgG antibody titers (by infection, reinfection, and/or vaccination) and neutralizing activity in children and adolescents. Hybrid immunity and immunity after vaccination induced the highest antibody titers as well as neutralizing capacity and were likely to confer the best protection against reinfections and possibly severe disease.

Circulating, virus-specific T-cell responses in children and adolescents were largely low, heterogeneous, and not reflective of prior infections or vaccinations. Therefore, adding cellular immunity assessment to serological surveillance offers limited value yet entails effort and cost. Monitoring humoral immunity is likely more cost-effective and should be the primary focus of immunological surveillance.

Implementing standardized interviews and an adjudication process, alongside self- or proxy-reported data, helps determine whether persistent symptoms are related to SARS-CoV-2 or other causes. Relying solely on self- or proxy-report, without contextual information, likely overestimates symptoms compatible with Long COVID in children and adolescents.

In conclusion, this dissertation showed how a school-based approach was crucial for generating insights into the impact of COVID-19. The findings have implications for clinical practice, research, and policy. They demonstrate that schools can serve as key settings for collecting reliable and representative data essential for guiding public health responses during a pandemic.