

Comparison of SARS-CoV-2 nucleocapsid antigen levels and in-house PCR Ct values in nasopharyngeal swab samples

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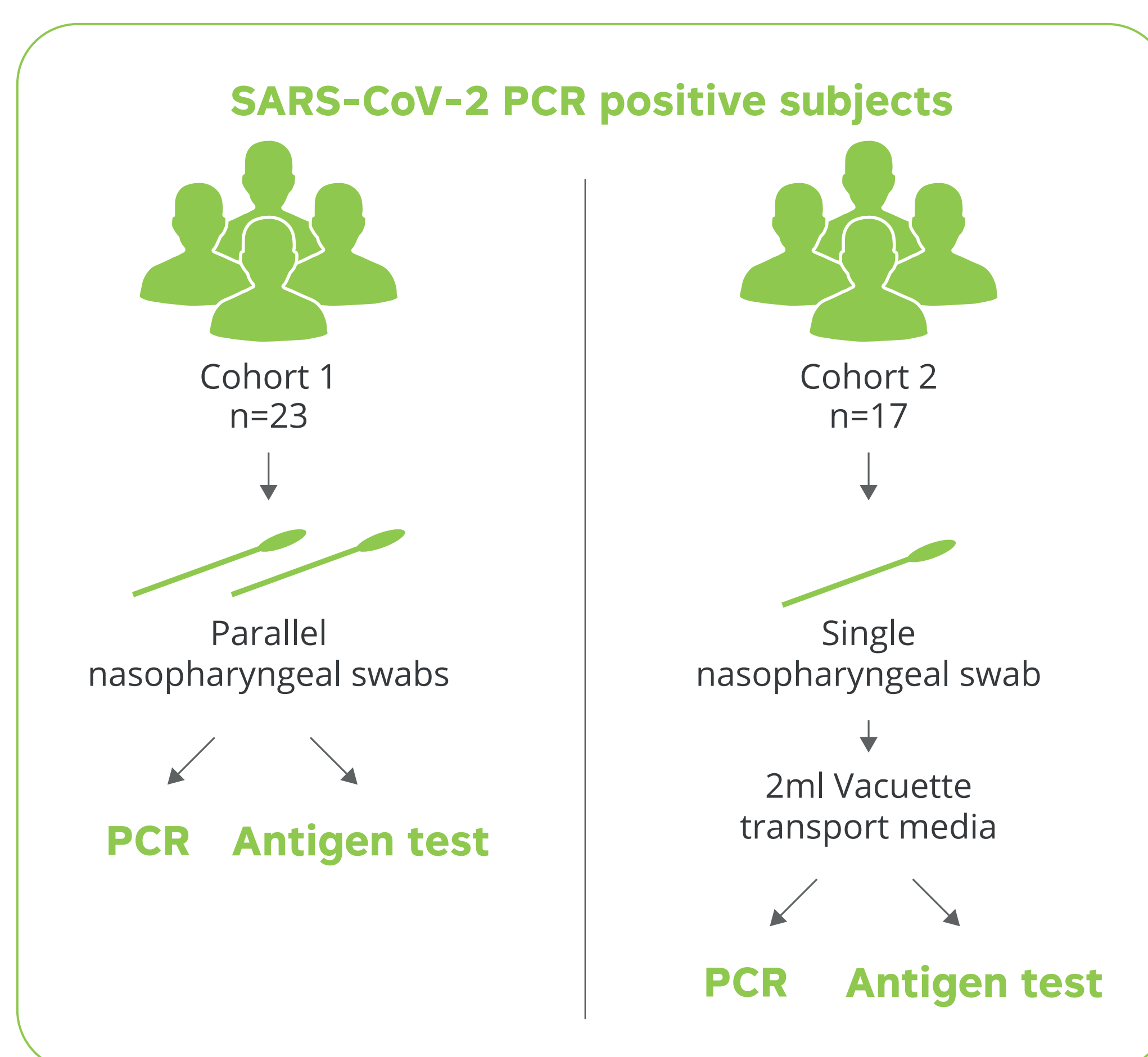
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Introduction

Materials and methods

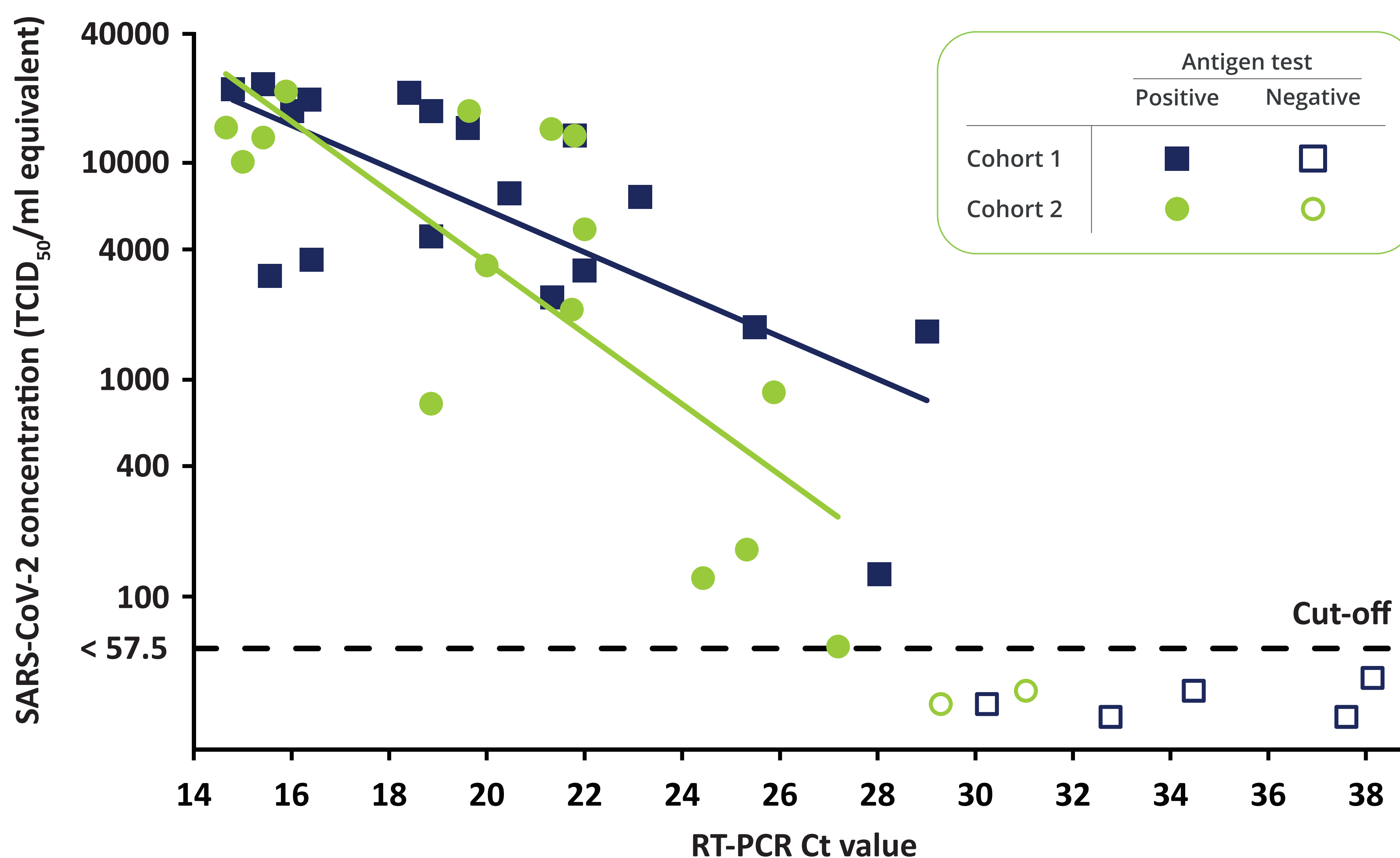
It has been speculated that individuals detected positive for SARS-CoV-2 with antigen tests are more contagious than individuals tested positive only with PCR tests. mariPOC[®] is an automated rapid antigen test for SARS-CoV-2 nucleocapsid protein. Although mariPOC results are reported qualitatively to end-users, the fluorescence detection is fully quantitative in the limits of clinical sampling. Our aim was to evaluate how the antigen test levels correlate with PCR cycle threshold (Ct) values in clinical samples taken from symptomatic SARS-CoV-2 individuals.



Nasopharyngeal swab samples were collected from two cohorts, as part of a daily COVID-19 diagnostic testing and a method comparison study at primary care health clinic in Kaarina, Finland. mariPOC testing was conducted on-site at Kaarina, while PCR testing was done at Turku University Hospital. mariPOC test fluorescence signals were converted into virus concentrations (TCID₅₀/mL) against response obtained from reference SARS-CoV-2 preparation, NR-52287, BEI Resources, USA. Antigen test response was compared with in-house PCR test Ct value for E gene.

Results

The figure shows that there was only a moderate correlation between antigen test response and PCR test Ct values (cohort 1 and 2 showed R² of 0.52 and 0.59, respectively) among the samples positive with both tests. The correlation was better in cohort 2 due to the absence of sample variation caused by collecting parallel swabs in cohort 1.



Positive samples with	Samples included	
	Ct < 30	Ct < 33
Antigen test	33	33
PCR	34	37
Sensitivity	97.1%	89.2%

Conclusions

Moderate correlation between antigen test response and PCR Ct values

Possible explanation

Samples were collected over wide period of time (symptom day 0 - 10)



Virus RNA is known to persist for a relatively long time while antigen levels remain detectable only for the acute phase of the disease

mariPOC test detected majority of the samples with **PCR Ct < 30**



mariPOC is suitable for rapid detection of individuals who most probably are contagious