Using Serosurveillance for SARS-CoV-2 to Conserve PCR Tests in a Resource Constrained Combat Environment

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Background: In March 2020, COVID-19 threatened combat operations in Afghanistan. At that time, the NATO Resolute Support mission involved nearly 17,000 troops from 38 partner nations, plus civilians who support the mission, scattered throughout Afghanistan. While Afghanistan did not initially report many confirmed cases, large numbers of cases were reported from neighboring countries with known migration across the borders (sometimes thousands/day). Military medical leaders advised commanders regarding the potential health risks to the force, balancing with risks to the mission. Quarantine and isolation protocols were established. Public health interventions of social distancing, cloth mask wear, enhanced environmental cleaning, active case finding, and emphasis on hand hygiene and cough etiquette were enforced. However, many base locations were unable to alleviate close living quarters. Testing was identified as a means to assess risk to the population. Testing capabilities were limited, particularly PCR. When this testing strategy was established, the utilization and interpretation of antibody tests was quite controversial. With rapid antibody kits, the time to detection of both IgM and IgG are similar; detection of either cannot identify the time since exposure.

Methods: A novel surveillance plan was established whereby subpopulations at highest risk for exposure to the virus were screened with antibody tests from 17 Apr-1 Jun, 2020. High risk populations included: those leaving quarantine, base defense guards, isolation unit staff, medical personnel, dining facility workers, and those who interact with local populations. Individuals with detectable antibody (either IgM or IgG) were further evaluated with PCR tests.

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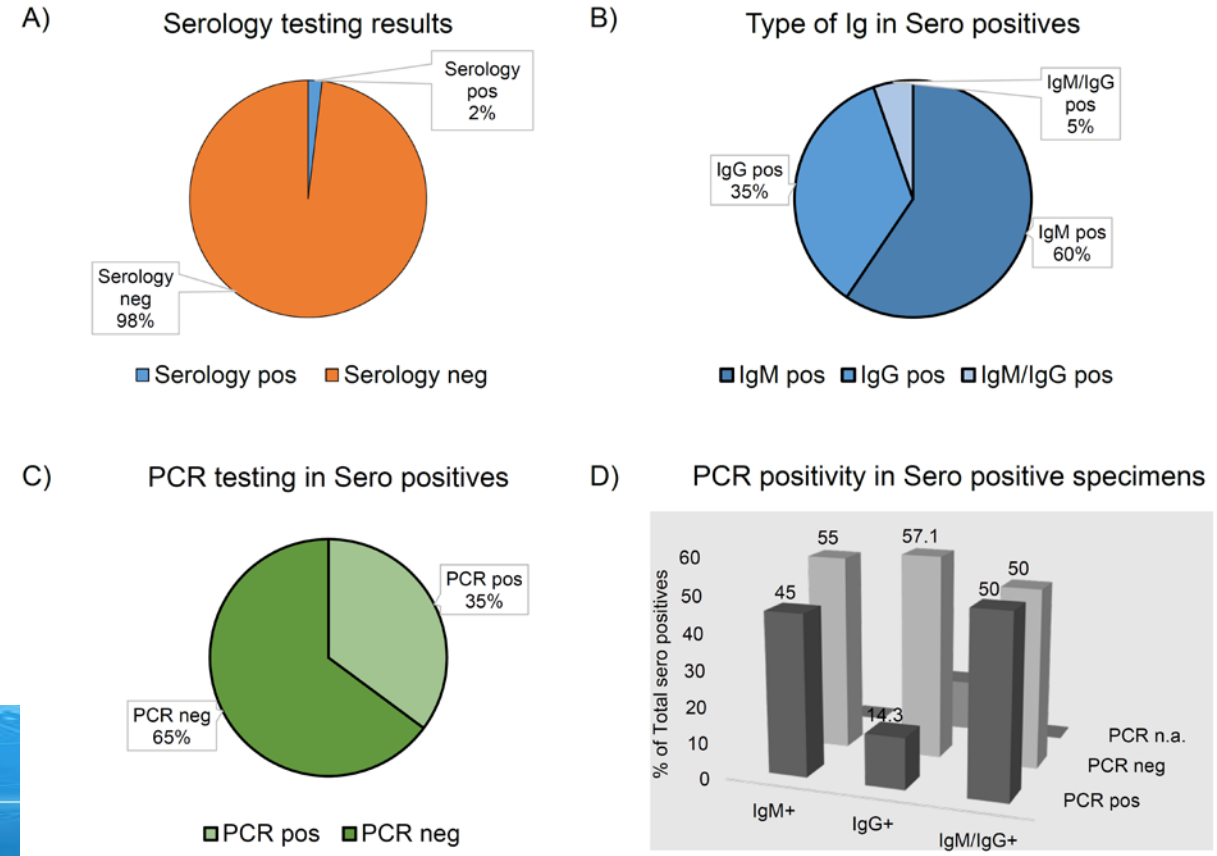
Results: In the first six weeks of this testing strategy, 1957 antibody tests were utilized. A total of 37 specimens were identified antibody positives with seroprevalence of 2% (Figure 1). Thirteen were identified to have positive IgG, 22 with IgM, and 2 with both. PCR was performed on those with detectable antibody, 13 (35%) had positive PCR.

Figure 1: Seroprevalence of sars-CoV-2 in asymptomatic population at a military base



Conclusion:
In a resource constrained combat environment, serosurveillance was able to identify asymptomatic carriers of SARS-CoV-2, while conserving PCR testing capabilities. While the seroprevalence was revealed to be low, 35% of those with antibodies were found to have detectable virus. Additionally, populations who had been exposed to the virus were identified.