

## Abstract

# Diagnostic Accuracy of Rapid Antigen Tests in Asymptomatic Close Contacts of Individuals With Confirmed SARS-CoV-2 Infections in the Herat Province of Afghanistan in 2021: Cross-sectional Study

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## Abstract

**Background:** Early detection and isolation are key strategies for containing the COVID-19 pandemic in resource-poor countries, including Afghanistan, where access to the vaccines is limited. These strategies could reduce burden on the health care system, which is already weak because of conflicts and war. The first COVID-19 case in Afghanistan was detected in the Herat province close to Iran. Currently, both rapid antigen tests and reverse transcription–polymerase chain reaction (RT-PCR) have been used for the diagnosis of COVID-19 in the Herat province.

**Objective:** This study aimed to assess the accuracy of the rapid antigen test in asymptomatic close contacts of individuals with confirmed COVID-19 in the Herat province.

**Methods:** This was a cross-sectional study conducted by contact-tracing surveillance teams in the Herat province. The teams listed 200 asymptomatic close contacts of individuals with confirmed COVID-19, and 2 separate nasopharyngeal specimens were collected. The rapid antigen test (Biosensor) was used on the fourth and seventh day after contact, and the second specimen was sent to the reference lab for RT-PCR testing. Descriptive statistics were calculated. The sensitivity and specificity of the rapid antigen tests were compared with those of RT-PCR.

**Results:** The median age of the contacts was 35 years (range 11-90 years), and 138 (70%) were women. Of the 196 (98%) contacts for whom RT-PCR was used, 105 (53%) had confirmed results for SARS-CoV-2 infection. Only 30 (15%) cases of SARS-CoV-2 infection were confirmed by the rapid antigen test, which indicates a sensitivity of 20.1%. However, the specificity of the rapid antigen test was high (90%).

**Conclusions:** The sensitivity of the rapid antigen tests was relatively low to confirm COVID-19 in asymptomatic close contacts of individuals with confirmed COVID-19. Therefore, if resources allow, RT-PCR would be the best choice with its high sensitivity rate to diagnose COVID-19 in asymptomatic close contacts of individuals with confirmed COVID-19. Further study with a large sample size is needed.

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## KEYWORDS

rapid antigen test; SARS-CoV-2; diagnostics; close contacts

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