

EVALUATION OF CANINE DETECTION OF COVID-19 INFECTED INDIVIDUALS UNDER CONTROLLED SETTINGS

Anne-Lise Chaber¹, Susan Hazel¹, Brett Matthews², Alexander Withers¹, Guillaume Alvergnat³, Dominique Grandjean⁴, and Charles Caraguel¹

¹The University of Adelaide School of Animal and Veterinary Sciences

²Detector Dog Program Operational Strategy and Coordination Australian Border Force Bulla 3428 Australia

³International Affairs Bureau Ministry of Interior of the UAE POBox 389 United Arab Emirates

⁴Ecole Nationale Veterinaire d'Alfort

May 9, 2021

Abstract

RT-PCR is currently the standard diagnostic method to detect symptomatic and asymptomatic individuals infected with SARS-CoV-2. However, RT-PCR results are not immediate and may falsely be negative before an infected individual sheds viral particle in the upper airway where swabs are collected. Infected individuals emit volatile organic compounds (VOCs) in their breath and sweat that are detectable by trained dogs. Here we evaluate the diagnostic accuracy of dog detection against SARS-CoV-2 infection. Fifteen dogs previously trained at two centres in Australia were presented to axillary sweat specimens collected from known SARS-CoV-2 human cases and non-cases. The true infection status of the cases and non-cases were confirmed based on RT-PCR results as well as clinical presentation. Across dogs, the overall diagnostic sensitivity (DSe) was 95.6% (95%CI: 93.6%-97.6%) and diagnostic specificity (DSp) was 98.1% (95%CI: 96.3%-100.0%). The DSp decreased significantly with non-case specimens sourced from UAE (P -value < 0.001). The location of evaluation did not impact the detection performances. The accuracy of detection varied across dogs and experienced dogs revealed a marginally better DSp (P -value = 0.003). The potential and limitations of this alternative detection tool are discussed.

Hosted file

Chaber et al.-COVID canine detection controlled evaluation.pdf available at <https://authorea.com/users/412712/articles/521301-evaluation-of-canine-detection-of-covid-19-infected-individuals-under-controlled-settings>