Global Health

Dogs May Reliably Detect SARS-CoV-2 Infections at Mass Events

Dogs trained to detect SARS-CoV-2 infection by smell correctly identified individuals with active infections at concerts with a specificity of nearly 100% and a sensitivity of 82%, researchers reported in BMJ Global Health. The results suggest that dogs may provide a fast and reliable screening option for public events at which mass screening is required.

Eight trained dogs of various breeds were presented with sweat samples from 2802 concertgoers at 4 events in Germany organized for the study. Each person underwent SARS-CoV-2 antigen and polymerase chain reaction (PCR) testing at the concert, but the investigators, dog handlers, and dogs did not know the results. Most of the human participants were vaccinated against COVID-19 but this did not affect the dogs’ ability to detect active infections.

Sweat samples collected previously from 38 patients with SARS-CoV-2 infections were randomly introduced into the test lineup, raising the total sample prevalence to 1.34% from a background rate of 0.2%. A positive finding was confirmed by a second dog sniffing the same sample. It took about 1 to 2 seconds for the dogs to smell each sample.

The dogs turned up only 2 false-positive results and 1 false-negative result. Positive identification of SARS-CoV-2 infection by 2 dogs was confirmed for another patient by a PCR test 2 days later, suggesting that dogs may be able to detect an infection before virus shedding, the authors wrote. Overall, the canine test had a positive predictive value of 70% and a negative predictive value of 99.7% assuming a prevalence rate of 0.2%.

Previous studies found that dogs can identify SARS-CoV-2 infections with high diagnostic accuracy, but the new research demonstrated it under real-world mass screening conditions, the authors wrote. Medical scent-detection dogs provide an additional opportunity to control the ongoing COVID-19 pandemic and possibly future pandemics, especially in areas or countries with limited test infrastructure or financial means, they concluded.

WHO: Vaccine Market Report Highlights Inequitable Global Distribution

Largely driven by COVID-19, vaccine doses distributed worldwide jumped to 16 billion in 2021, nearly 3 times the 5.8 billion in 2019, according to the World Health Organization (WHO) 2022 Global Vaccine Market Report. However, low- and middle-income countries (LMICs) often received proportionally less vaccine than high-income countries (HICs), and non-COVID vaccine use dropped for children in many areas.

Excluding COVID-19 vaccines, overall adult vaccine supply grew 15%, mainly due to greater seasonal influenza vaccine use in HICs. Pediatric vaccines used worldwide, including hepatitis B, Haemophilus influenzae type B, and inactivated polio vaccines, increased 8%, while child and adolescent vaccine supplies, including human papillomavirus and meningococcal vaccines, rose 7%.

Over the same period, supplies of vaccines used locally or sporadically, including for anthrax, cholera, Ebola, rabies, smallpox or monkeypox, and yellow fever, fell 7%. Pediatric vaccines used primarily in HICs, such as the DTaP (diphtheria, tetanus toxoids, and pertussis) vaccine, dropped 12%, while pediatric vaccines used primarily in LMICs, including some for diphtheria, malaria, measles, pertussis, polio, tetanus, tuberculosis, and typhoid, plummeted 22%.

Inequitable distribution was a problem for all types of vaccines, the WHO report said. For example, the African region has one-fifth of the global population but received just 3% of all COVID-19 doses in 2021. Similarly, human papillomavirus vaccines are only available in 41% of low-income countries compared with 83% of HICs. Pricing is also a challenge, especially for MICs, which pay as much or more than HICs for some products. Both problems stem in part from the concentration of about 70% of global non–COVID-19 vaccine manufacturing in the hands of 10 companies, according to the report. Many vaccines are available only from 2 or 3 suppliers.

Although the development of COVID-19 vaccines in just 11 months showed how effectively the world can confront a pandemic challenge, subsequent access issues spotlight a need for reforms, the report said. It calls on governments to provide greater support for immunization programs and on manufacturers to focus on priority pathogens, facilitate technology transfer, and commit to equity-driven vaccine allocation.

How Early COVID-19 Restrictions Effected Progress on Neglected Tropical Diseases

COVID-19 precautions taken in 2020 disrupted efforts to eliminate several neglected tropical diseases by 2030, which could delay some regions from reaching tropical disease control goals by 2 to 3 years in some cases, according to a modeling study. However, mitigation strategies could help avoid losing progress made in 2015 to 2019, the authors wrote.

To comply with movement and physical distancing restrictions necessary for controlling COVID-19, in April 2020, the World Health Organization (WHO) recommended postponing neglected tropical disease control activities that involved community-based surveys, active case finding, and mass drug administration. Later that year these community-based programs were
gradually restarted in accordance with revised WHO recommendations.

However, many neglected tropical disease programs faced serious challenges. In addition to missed drug administration and vector control such as insecticide spraying, these included hesitancy to participate, reassignment of tropical disease personnel to COVID-19 interventions, delays in active case finding and passive case presentation at health facilities, and delays in manufacture and supply of tropical disease medicines.

In the new study, published in The Lancet Global Health, researchers modeled the effect of such disruptions on goals set for 2030 for 7 diseases. The study found that the average delay in progress was equal to the disruption’s duration. However, longer delays were projected in areas with high endemicity. For onchocerciasis and visceral leishmaniasis, a 1-year disruption could delay reaching targets by up to 3 years. Similarly, interruptions of 12 months or longer in high-endemic trachoma and schistosomiasis settings could extend the delays much longer than 1 year, the researchers found.

Adding more rounds of mass drug administration and vector control, as well as stepping up case finding, could put neglected tropical disease control back on track or even accelerate progress toward the 2030 goals. Costs would increase an estimated 30%, creating another obstacle for countries already in poverty. However, with appropriate funding, planning, and advocacy, recent years’ gains might not be lost, the authors wrote.

**Wide Variation in Reported Type 1 Diabetes Incidence in Children Around the World**

The reported incidence of type 1 diabetes from birth to 19 years varied more than 20-fold by region, with higher rates generally seen in higher-income countries, according to a scoping review published in PLOS Global Public Health.

The rate per 100,000 in the entire population age group ranged from 39.0 in northern Europe to 20.7 in North America, 10.1 in northern Africa, and less than 2 in eastern and western Africa. Results were similar in studies limited to ages 0 to 14 years, with rates of 24 per 100,000 in northern Europe, 22.8 in Australia and New Zealand, 18 in North America, and less than 1 each in Melanesia, western Africa, and South America.

A paucity of information on type 1 diabetes in lower-income countries, particularly sub-Saharan Africa, may explain some of the variation, according to the authors. Investment in population-based registries and longitudinal cohort studies would help generate better data to guide policy decisions, resource allocation, and targeted interventions to improve type 1 diabetes services, the authors wrote.

— Howard Larkin

**Note:** Source references are available through embedded hyperlinks in the article text online.